Family 8284+01 IBM Power System S822 server

IBM Japan Sales Manual
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Product life cycle dates

Type Model	Announced	Available	Marketing Withdrawn	Service Discontinued
8284-22A	2014-04-28	2014-06-10	2019-02-28	-

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Abstract

The IBM 8284 is a Power System S822 server that brings together business transaction processing with infrastructure for social and mobile solutions in UNIX. IBM i, and Linux operating environments. A 2-socket 2U system which can be ordered with the flexibility of either one or two processor sockets populated provides growth capacity for customers who need it. It provides the benefits of greater performance per core as well as per socket with POWER8 processors, new I/O capabilities, higher internal storage and PCIe capacities and performance, the capability to support CAPI accelerator devices, and greater RAS, including hot-plug PCIe capability.

Model abstract 8284-22A

The IBM 8284 Power System S822 Model 22A supports two processor sockets, offering 4-core 3.02 GHz or 8-core 4.1 GHz POWER8 Processor Card, 6-core or 12-core 3.89 GHz or 10-core or 20-core 3.42 GHz POWER8 configurations in a 19-inch rack-mount, 2U (EIA units) drawer configuration. All the cores are active. The Power S822 server supports a maximum of 16 DDR4 CDIMM slots. Memory features supported are 32 GB, and 64 GB and run at speeds of 1600 Mbps, allowing for a maximum system memory of 1024 GB.

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Highlights

The IBM Power System S822 server is a powerful 2-socket server that ships with up to 20 activated cores and I/O configuration flexibility to meet today's growth and tomorrow's processing needs. The server features:

- The following fully activated IBM POWER8 dual-chip module (DCM) processor module configurations in a 2U rack-mount form factor:
  - 4-core 3.02 GHz
  - 8-core 4.1 GHz
  - 6-core or 12-core 3.89 GHz
  - 10-core or 20-core 3.42 GHz
- Up to 1024 GB of DDR4 memory
- Choice of storage features:
  - Eight SFF-3 Bays/six 1.8-inch SSD bays/DVD Bay/Dual IOA with Write Cache
  - Twelve SFF-3 Bays/DVD Bay
  - Split feature to 6+6 SFF-3 Bays: Add a second SAS Controller
- Expansion capabilities for the EXP24S SFF Gen 2-bay Drawer
- Hot-swap PCIe Gen 3 slots
- Integrated:
  - Service processor
  - EnergyScale technology
  - Hot-swap and redundant cooling
  - USB 3.0 and 2.0 ports
  - Two HMC ports
  - One system port with RJ45 connector
- Two hot plug, redundant power supplies
- 19-inch rack-mounting hardware (2U)

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Description

Power scale-out server enhancements

4.1 GHz for Power S822 and S822L

A 8-core 4.1 GHz Processor Card (#EPXL/#ELPF) is added to the Power S822 (8284-22A) and Power S822L (8247-22L) servers. It provides a per-core performance increase compared to the previous S822 maximum of 3.8 GHz and the S822L maximum of 3.4 GHz.

Configuration rules associated with the 4.1 GHz Processor Card generally match rules provided of other gigahertz processor cards. For example, the S822 server can be configured with one feature EPXL 8-core processor card or with two cards (an 8-core or 16-core server) and the S822L server can be configured with two feature ELPF cards (a 16-core server). However, there are some configuration differences designed to ensure proper cooling of the 4.1 GHz S822 and S822L servers:

- When feature EPXL is configured, simultaneous multithreading (SMT) may not exceed SMT4.
- The memory maximum is 512 GB and only 16 GB or 32 GB DIMMS are supported. The 64 GB DIMM is not supported.
- Specific PCIe adapters are not supported in the system unit: feature EJ0M/EL3B/EJ11/EL60 SAS adapters, feature EC32/EL3D IB adapter, and feature EC37/EL3X/EC2M/EL40 NIC/RoCE adapter.

Installation and operation of systems with feature EPXL will result in greater fan noise than the fan noise of the equivalent IBM machine without feature EPXL. Local regulations may govern noise level exposure in the workplace and surrounding area, and may apply to the client and the client's machine installation. The actual sound pressure levels in client's installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where the client designates the racks to be installed; the noise levels from other equipment; the room ambient temperature; and employees' location in relation to the equipment. Further, compliance with such government regulations also depends upon a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. IBM recommends that the client consult with qualified experts in this field to determine whether the client's use of machines with feature EPXL is in compliance with the applicable regulations.

With the 4.1 GHz cards, good cooling in the machine room is recommended as heavy workloads might see some performance degradation above 30 degrees Celsius if internal temperatures trigger a CPU clock reduction. Fans also run faster with the 4.1 GHz cards, increasing the noise level somewhat. See the physical planning manual for more detail.

Firmware level 8.1.3, or later, is required unless PowerVM is being used. If PowerVM is being used, then Firmware level 8.3, or later, is required.

PCIe Gen3 I/O Drawer on scale-out servers

The maximum number of PCIe slots supported on Power scale-out servers is significantly increased with the support of the PCIe Gen3 I/O Drawer (#EMX0/#ELMX). The 4U drawer and its 6-slot Fan-out Module (#EMXF/ELMF) is the same drawer as previously announced on the Power E870 and E880 servers but different configuration options are available. Features EMX0 and EMXF are used on the Power S822, S814, and S824 servers. Features ELMX and ELMF are used on the Power S812L, S822L, and S824L servers.

A PCIe Gen3 I/O drawer can hold one or two 6-slot fan-out modules. Each fan-out module is attached to a PCIe3 Optical Cable Adapter located in a x16 slot in the system unit. The 4U scale-out servers use a single-width full-high adapter (#EJ08). The 2U scale-out server uses a double-width, low-profile PCIe3 Optical Cable Adapter (#EJ05) that is plugged into one x16 slot but then overlaps a second PCIe slot (either x16 or x8 depending on where the card is plugged). Note that use of the high-function SAS backplane (#EJ0U/#EL3U) requires the feature EJ05 adapter to overlap a x16 slot. The resulting maximums are shown in the table below.

	Number x16 slots	Maximum number of PCIe3 Optical Cable Adapter or fan-out modules	Maximum number of PCIe3 I/O drawers
2U, 1-socket	2	1	1 (half)
2U, 2-socket, one populated	2	1	1 (half)
2U, 2-socket, both populated	4	2	1
4U, 1-socket	2	2	1
4U, 2-socket, one populated	2	2	1
4U, 2-socket, both populated	4	4	2

Note: 1 For rack-mounted 6-core or 8-core server
This results in the following maximum number of PCIe slots on the server:

Scale-out server	With zero PCIe3 I/O drawer	With one 6-slot fan-out module	With two 6-slot fan-out module	With three 6-slot fan-out module	With four 6-slot fan-out module
2U, 1-socket	6	6-2+6 = 10	N/A	N/A	N/A
2U, 2-socket, one populated	6	6-2+6 = 10	N/A	N/A	N/A
2U, 2-socket, both populated	9	9-2+6 = 13	9-4+12 = 17	N/A	N/A
4U, 1-socket	7	7-1+6 = 12	7-2+12 = 17	N/A	N/A
4U, 2-socket, one populated	7	7-1+6 = 12	7-2+12 = 17	N/A	N/A
4U, 2-socket, both populated	11	11-1+6 = 16	11-2+12 = 21	11-3+18 = 26	11-4+24 = 31

A PCIe3 Optical Cable Adapter attaches to a fan-out module through an Active Optical Cable Pair. Use the 3-meter cable pair (#ECC7) for attaching an I/O drawer in the same rack as the scale-out server. Use the 10-meter cable pair (#ECC8) for attaching an I/O drawer in a different rack. The 2-meter cable pair (#ECC6) is not supported on scale-out servers due to the cable management arm at the rear of the scale-out servers. The two AOC cables connect to two CXP ports on the fan-out module and to two CXP ports on the EJ0x adapter. The top port of the fan-out module must be cabled to the top port of the EJ0x port. Likewise, the bottom two ports must be cabled together.

A blind swap cassette (BSC) is used to house the full-high adapters that go into the PCIe Gen3 slots. The BSC is the same BSC as used with the previous generation server's 12X attached I/O drawers (#5802 or #5877). The drawer is shipped with a full set of BSC, even if the BSC is empty. A feature number to order additional full-high BSC is not required or announced.

Over 30 PCIe adapters are supported in the PCIe Gen3 I/O drawer on scale-out servers, providing a robust set of configuration options. This list is almost identical to the list for the enterprise E870/E880 servers with the caveat that Linux-only servers sometimes use different feature numbers for the same adapter and that operating system-specific adapters can vary between different server models. Note that features 5748 and EC42 are not supported in the PCIe Gen3 I/O Drawer, which is different from what was announced on the Power E870/E880 I/O drawer.

Some of the adapters have specific slot placement considerations in the PCIe Gen3 I/O Drawer. See the PCIe Placement Guide for more specifics. Feature numbers EJ0J/EL59, EJ10, and EJ0L have a maximum four per fan-out module. Feature numbers 5785, 2893/2894, and EN13/EN14 have a maximum of one per fan-out module.

The PCIe slots in the PCIe Gen3 I/O drawer are hot plug, but adding a PCIe3 Optical Cable Adapter or a PCIe Gen3 I/O Drawer or fan-out module requires scheduled downtime.

With the addition of PCIe Gen3 I/O drawers to scale-out servers, the maximum number of PCIe adapters per server is increased. Associated with the increase in the number of SAS adapters is an increase to a maximum of 28 EXP24S HDD/SSD drawers (#5887/EL1S). This is a 100% growth over the Power 720/730/740 servers. There is a maximum of 16 EXP24S drawers per PCIe Gen3 I/O drawer due to cabling considerations. There is no change to the current maximum of 14 EXP24S drawers per scale-out system unit due to cabling considerations. There is no change to the 4-core S814 server supporting zero EXP24S drawers.

There is a racking consideration associated with the PCIe Gen3 I/O Drawer cable management bracket. The bracket is located at the rear of the drawer and swings up to provide service access to the PCIe adapters. 2U (2 EIA) of space is required to swing up the bracket. Thus the drawer cannot be placed in the very top 2U of a rack.

IBM Manufacturing can factory integrate the PCIe Gen3 I/O drawer in a rack if ordered together with either a 42U 7014-T42/#0553 rack or a 36U 7014-T00/#0551 rack. However, the drawer cannot be factory integrated in a 42U Slim Rack 7965-94Y/#ER05 due to potential vibration concerns during shipping. In the Slim Rack case the drawer would have to be installed at the client site.

IBM PurePower System Solution

IBM PurePower System Solution is a complete, flexible cloud infrastructure offering with integrated expertise. This offering integrates and optimizes all compute, storage and networking resources to deliver ready to deploy infraestructure out of the box.

IBM PurePower System offers rapid implementation and ROI with 12X greater workload density than competitors, and a virtualization hypervisor with zero documented vulnerabilities.

- Complete infrastructure stack up-and-running in hours vs days - Time to Value
- Built in workload elasticity - Automated workload scalability
- Single point of management
- Complete, pre-integrated software and hardware
- Easy integration through open-standards computing
- Easily extendable and accommodating to change
- Single service point of contact

The IBM PurePower System Solution is designed to deliver secure and dependable performance in a single 7014 Model B42 Rack. IBM e-config will guide you in configuring a solution that meets your needs from the following options:

- A total of six switches:
  - Two 2498 Model F48 SAN48B-5 switches
  - Two IBM 7120 RackSwitch G8052 Model switches
  - Two 8831-NF2 Mellanox switches
- One 7316-TF4 display
- One 2076 Storwize V7000 controller
- Two 8374-01M PurePower Management nodes
- Two to twelve of either IBM POWER8 technology-based servers:
  - IBM S822L (8247-22L)
  - IBM S822 (8284-22A)
- IBM Systems Lab Services startup services options (optional)

Built on POWER8 technology, IBM PurePower System Solution is a complete, flexible cloud converged infrastructure offering with integrated expertise. This offering seamlessly integrates and optimizes all compute, storage and networking resources to deliver ready to deploy infrastructure out of the box. IBM PurePower System Solution can be deployed in hours versus days, and features built-in workload elasticity, automated workload scalability, and single point of management.

These fully integrated, optimized solutions can be configured flexibly-for your specific business needs-and may be complemented by additional support and deployment services.

IBM PurePower System Solution is made up of nine announced machine type models. Place your order through e-config to select and configure eight of the nine different machine type models, creating the PurePower System Solution configuration.

IBM's e-config will guide you step by step in selecting one 7014-B42 19-inch rack; a total of six switches, including two 2498-F48 SAN48B-5 switches, two 7120-48E management switches, and two 8831-NF2 Mellanox switches; one 7316-TF4 display; one 2076-524 V7000 controller or optional 2076-24F V7000 expansion drawer, Management node (8374-01M); and either the POWER8 S822L (8247-22L) server or the POWER8 S822 (8284-22A) server. The minimum quantity allowed is two servers and the maximum is twelve servers. Mixing machine type models is not allowed in the configuration.

Minimum machine types required for PurePower System Solution

Machine type	Description	Default	Min	Max
8247-22L	IBM Power System S822L	2	0	12
8284-22A	IBM Power System S822	0	0	12
2498-F48	SAN48B-5 Switch	2	2	2
7120-48E	Management Switch	2	2	2
8831-NF2	Mellanox Switch	2	2	2
8347-01M	HW Management Node (Primary and Secondary node)	2	2	2
7014-B42	Enterprise Rack	1	1	1
7316-TF4	Display	1	1	1
2076-524	V7000 Controller	1	1	1

S822L Minimum configuration

Machine type/ Feature	Description	Default	Min	Max
8247-22L	IBM Power System S822L	2	0	2

```
4651        Rack Indicator Feature      1      1     1
EHKX        CI Base Indicator feature   1      1     1
EHKY        CI Add-On Indicator feature 0      0     12
EJTP        IBM Bezel + Misc Hdwr and   1      1     0
              Low-Function BP Filler, 22L
              Rack-Mount Drawer
EL1B        System AC Power Supply,     2      2     0
              1400 W
5771        SATA Slimline DVD-RAM Drive 1      1     0
6577        Power Cord to IBM PDU       2      2     0
2147        Primary Operating System    1      1     0
              Indicator - Linux
5000        SW Preload Indicator        1      1     0
0266        Linux Partition Specify     2      1     0
ELPD        10 C Processor 3.425 GHz    2      0     0
              POWER8 processor
ELAD        One Processor Activation for 20     0     0
              Processor Feature #EPXD
EL3P        16 GB CDIMM (1.35 V), 1600  16     0     0
              MHz
EL43        PCIe3 LP 16Gb 2-port Fibre  2      2     0
              Channel Adapter
EC3A        PCIe3 LP 2-Port 40GbE NIC   2      2     0
              RoCE QSFP+ Adapter
EN0V        PCIe2 LP 4-port (10Gb+1GbE) 2      2     0
              Copper SFP+RJ45 Adapter
EL3V        Split 6+6 storage backplane + 1    1     0
              Second SAS controller
ELDF        600 GB 15K HDD in Gen3      4      4     0
              carrier
EC22        PowerVM Linux Edition       20     20    0
ECCJ        Yellow Ethernet Cat 5E cable 2     2     0
              (MFG Sel length)
ECCG        Blue Ethernet Cat 5E cable  1      1     0
              (MFG Sel length)
ECCH        Green Ethernet Cat 5E cable 1      1     0
              (MFG Sel length)
ECCK        Fiber SAN cable (MFG Sel    4      4     0
              Length)
ECCN        DAC QSFP+ TO QSFP+ Cable    4      4     0
              (MFG Sel Length)
9447        New VIOS Core counter       2      0     0
93XX        Language Specify code       1      1     0
ESC0        Free shipping               1      1     0
```

OR

POWER8 S822 (8284-22A) Minimum configuration

```
Machine type/
Feature       Description                   Default   Min   Max
------------- ---------------------------- -------   ---   ---
8284-22A      IBM Power System S822         0         0     12

4651          Rack Indicator Feature        1         1     1
EHKX          CI Base Indicator feature     1         1     1
EHKY          CI Add-On Indicator feature   0         0     12
EJT4          IBM Bezel + Misc Hdwr and     1         1     0
                Low-Function BP Filler, 22L
                Rack-Mount Drawer
EB2M          System AC Power Supply,       2         2     0
                1400 W
5771          SATA Slimline DVD-RAM Drive   1         1     0
6577          Power Cord to IBM PDU         2         2     0
5000          SW Preload Indicator          1         1     0
0265          AIX Partition Specify         2         0     0
0266          Linux Partition Specify       0         0     0
EPXD          10 C Processor 3.425 GHz      2         0     0
                POWER8 processor
EPYD          One Processor Activation for  20        0     0
                Processor Feature EPXD
EM96          16 GB DDR4 1600 MHz           16        0     0
EN0B          PCIe3 LP 16Gb 2-port Fibre    2         2     0
                Channel Adapter
EC3A          PCIe3 LP 2-Port 40GbE NIC     2         2     0
                RoCE QSFP+ Adapter
EN0V          PCIe2 LP 4-port (10Gb+1GbE)   2         2     0
                Copper SFP+RJ45 Adapter
EJ0V          Split #EJ0T to 6+6 SFF-3      1         1     0
                Bays: Add 2nd SAS controller
ESDF          600 GB 15K HDD in Gen3        4         4     0
                carrier
5228          PowerVM Linux Edition         20        20    0
ECCJ          Yellow Ethernet Cat 5E cable  2         2     0
                (MFG Sel length)
ECCG          Blue Ethernet Cat 5E cable    1         1     0
                (MFG Sel length)
ECCH          Green Ethernet Cat 5E cable   1         1     0
                (MFG Sel length)
ECCK          Fiber SAN cable (MFG Sel      4         4     0
                Length)
ECCN          DAC QSFP+ TO QSFP+ Cable      4         4     0
                (MFG Sel Length)
9447          New VIOS Core counter         2         0     0
```

```
93XX              Language Specify code        1       1     0
ESC0              Free shipping                1       1     1
```

2076-524 (V7000 Controller)

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
2076-524          V7000 Controller Gen2        1        1     1

4651              Rack Indicator Feature       1        1     1
EHKX              CI Base Indicator feature    1        1     1
EFD0              MFG Routing Indicator for    1        1     0
                   Rochester / Shenzhen
9730              Power Cord - PDU Connection  1        1     0
AHF3              1.2 TB 2.5 in 10K HDD        8        8     24
AHB1              8G FC adapters with SFPs (two 1       0     0
                   cards per FC, one for each
                   canister)
AG00              Free shipping                1        1     0
5301              1m Fiber Cable (LC)          4        4     0
9170              V7000 Grouping Specify       1        1     0
```

2076-24F - Expansion

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
2076-24F          V7000 Controller Gen2        0        0     12

4651              Rack Indicator Feature       1        1     1
EHKY              CI Add-On Indicator feature  1        1     1
XXXX              Route to Power Manufacturing 1        1     0
9730              Power Cord - PDU Connection  1        1     0
AHF3              1.2 TB 2.5 in 10K HDD        8        0     24
XXXX              12G SAS cable. MFG Sel Length 2       2     0
AG00              Free shipping                1        1     0
9170              V7000 Grouping Specify       1        1     0
```

Base Configuration 8734-01M

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
8374-01M          Management Node              2        2     2

4651              Rack Indicator Feature       1        0     1
EHKX              CI Base Indicator feature    1        1     1
EHKZ              Converged Primary HW         0        0     1
                   Management Node Indicator
0962              Install HMC code             1        0     1
EB2U              RAID 1                       1        1     1
6577              Power Cord to IBM PDU        2        2     2
ESC0              Free Shipping                1        1     1
```

Base Configuration 2498-F48

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
2498-F48          SAN48 Switch                 2        2     2

4651              Rack Indicator Feature       1        1     1
EHKX              CI Base Indicator feature    1        1     1
2809              SFP 8 Gbps SW 8-Pack         1        1     0
2601              SFP 16 GBPS SW -1-pack       4        4     0
7411              12-Port Activation           0        0     0
AG00              Free shipping code           1        1     0
```

Base 7120-48E Management Switch

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
7120-48E          Management Switch            2        2     2

4651              Rack Indicator Feature       1        1     1
EHKX              CI Base Indicator feature    1        1     1
EDT2              1U Duct for 7120-48E         1        1     0
EU27              Duct Enabled Rail Kit        1        1     0
6577              Power Cord to IBM PDU        2        2     0
1118              Yellow Ethernet Cat 5E cable 13       13    0
```

Base 8831-NF2 Internal Data Switch (Mellanox)

```
Machine type/
Feature           Description                Default   Min   Max
-------------     --------------------------  -------   ---   ---
8831-NF2          Management Switch            2        2     2

4651              Rack Indicator Feature       1        1     1
```

```
EHKX          CI Base Indicator feature      1        1     1
EDT4          Airduct                        1        1     1
EB41          1 M DAC cable                  1        1     0
```

Base Configuration 7014-B42

```
Machine type/
Feature       Description              Default   Min   Max
-------------  ------------------------- -------   ---   ---
7014-B42      Enterprise Rack                1        1     1

ER2T          2U Cable reserved on top of    1        1     0
               the rack
4651          Rack Indicator Feature         0        0     0
EHKX          CI Base Indicator feature      1        1     1
ER1D          Rack Content Specify:          2        2     2
               8831-NF2
ER0U          Rack Content Specify:          0        0    12
               8284-22A - 2EIA (2U)
ER0V          Rack Content Specify:          0        0    12
               8284-22L - 2EIA (2U)
0340          Rack Content Specify:          2        2     0
               2498-F48
ER09          Rack Content Specify:          2        2     0
               7120-48E
ER0R          Rack Content Specify:          1        1     0
               2076-524
ER0S          Rack Content Specify:          0        0    12
               2076-24F
ER0E          Rack Content Specify:          1        1     1
               7316-TF4
ER1B          Rack Content Specify:          1        0     0
               Reserve 1U Space at Bottom
               of Rack
ER1G          Rack Content Specify:          1        0     1
               8734-01M
ERLR          Left/Right PDU Redundancy      1        0     0
               Specify
7109          Smart PDU                      4        4     4
ESC0          Free Shipping                  1        1     1
```

Base Configuration 7316-TF4

```
Feature       Description              Default   Min   Max
-------       ------------------------- -------   ---   ---
4651          Rack Indicator, Rack #1        1        1     1
EHKX          Pure Power Base Indicator      1        1     1
9911          Power Cord (4M) Specify --     4        4     0
               All (Standard rack power cord)
88xx          Keyboards - USB                1        1     1
4283          IBM 1x8 Rack Console Switch    1        1     1
4269          Cable, USB Conversion          1        1     1
               Option -- 1.5 meters
ESC0          Free Shipping                  1        1     1
```

Base MTMs Location in 7014-B42 rack

```
Machine type  Description                EIA Location
------------  ------------------------- ------------
8247-22L      IBM Power System S822L         2
8247-22L      IBM Power System S822L         4
8347-01M      Primary HW Management Node     7
8347-01M      Secondary HW Management Node   6
2076-524      V7000 Controller              12
7120-48E      First Management Switch       17
7120-48E      Second Management Switch      16
2498-F48      First SAN48B-5                19
2498-F48      Second SAN48B-5              18
8331-NF2      First Mellanox Switch         21
8331-NF2      Second Mellanox Switch        20
7316-TF4      Display                       22
```

FlashSystem 900 Support on PurePower System speeds time-to-value for big data and analytics workloads

With the addition of the FlashSystem 900, IBM PurePower System now combines the processing ability of IBM POWER8 with the enterprise capabilities and high performance of IBM FlashSystem storage to bring rapid time to value for key database and analytics workloads. With the addition of the FlashSystem 900 support via IBM-validated reference architecture, customers now have the choice of deploying an IBM all-flash storage array into the PurePower System fabric to power their most performance hungry application environments.

Flash storage is increasingly popular within all types of organizations, with its ability to deliver fast, reliable, and consistent access to critical data. With the new IBM FlashSystem 900 storage arrays, businesses can make faster decisions based on real-time insights and unleash the power of the most demanding applications, including online transaction processing and analytics databases, virtual desktop infrastructures, technical computing applications, and cloud environments. FlashSystem solutions can fit within the tightest storage budgets because they use much less power and space than traditional hard disk drive systems.

IBM FlashSystem 900 is a fully optimized, all-flash storage array designed to accelerate the applications that drive business. Featuring IBM FlashCore Technology, FlashSystem 900 delivers the high performance, ultra-low latency, enterprise reliability, and superior operational efficiency required for gaining a competitive advantage in today's dynamic marketplace.

Key features include:

- The ability to support more concurrent users, improve query response times, shorten batch processes, and speed backups
- Powered by IBM FlashCore Technology for consistently high performance at lower cost
- IBM-enhanced Micron MLC+ technology for higher storage density and improved endurance
- The ability to scale capacity and performance incrementally to match changing requirements
- Availability improvements with IBM Variable Stripe RAID to retain completely redundant, hot-swappable components and concurrent code loads

IBM FlashCore Technology is at the center of FlashSystem 900. Hardware-accelerated I/O means that data paths involve redundant, nonblocking crossbar backplanes, hardware-based RAID controllers separated from the system management functionality that allows concurrent code loading, and maintenance with virtually no performance impacts. Advanced flash management features for increased flash endurance and performance with decreased latency include:

- Variable Stripe RAID technology
- Unique IBM engineered error correction codes
- Overprovisioning capabilities
- Ultra-fast write buffers and hardware-based data offloads
- Proprietary garbage collection relocation, and block picking algorithms invented by IBM

FlashSystem 900 comes with IBM-enhanced MLC+ technology, providing organizations with the next generation of efficiency, economics, and endurance. IBM MicroLatency delivers microsecond response times to accelerate the most demanding applications. The system includes fully redundant, hot-swappable components and multiple RAID layers for enterprise-class reliability, concurrent code upgrades to help maximize uptime and availability, and support for tool-less, front access to all components for easy serviceability. FlashSystem 900 maintains performance and enhances reliability without sacrificing usable capacity.

PCIe Gen3 adapters

4-port 10Gb Ethernet Adapter

IBM FlashSystem 900, including its MicroLatency Flash Modules, is covered by up to seven years of total hardware support through the applicable warranty period plus up to six years of optional post- warranty hardware maintenance. Clients may purchase the post-warranty hardware maintenance either at the time of system purchase or up until IBM announces withdrawal from marketing or withdrawal from service. IBM also may offer warranty service upgrades that provide additional services during the warranty period. IBM reserves the right to modify or withdraw this or any other offerings at any time. Other terms, conditions and exclusions apply. Consult with your advisors about the appropriate financial treatment for this offering. Not available in all countries. Contact your sales representative for more information.

Power S822 and IBM i

IBM i support is provided at a price-attractive P10 software tier even though the S822 can have two sockets. However there are limitations to the max size of the partition and all I/O must be virtualized through VIOS. With firmware 860.10 or later, up to four cores (real or virtual) per IBM i partition are supported. With earlier firmware levels, up to two cores (real or virtual) per IBM i partition are supported. Multiple IBM i partitions can be created and run concurrently, and each individual partition can now have up to two or four cores.

PCIe Gen3 adapters

4-port 10Gb Ethernet Adapter

The PCIe3 4-port 10GbE Adapter doubles the number of 10GbE ports per adapter, saving PCIe slots on POWER8 servers. The adapter is supported in full-high slots such as the PCIe Gen3 I/O drawer and the 4U scale-out system units and in the Power E870/E880 system node slots. It does not fit in the 2U scale-out server low-profile slots. In addition to Ethernet NIC support, it also provides SR-IOV NIC support, which can allow further virtualization and slot savings.

The adapter has four SFP+ ports. All four ports use SR optical fiber cabling or all four use copper twinax cabling. Optical transceivers are included with the SR adapter feature. Copper twinax transceivers are included on the separately ordered copper cables.

	LP+ for system node	Full-high tail stock
SR Optical Fiber	#EN16	#EN15
Copper twinax	#EN18	#EN17

IBM i, AIX, and Linux support this adapter, both with and without VIOS. IBM i supports the use of this adapter for IBM i LAN console. NIM and Linux Network Install function is supported. See the feature code description for prerequisite software levels.

2-port 56Gb FDR InfiniBand Adapter

The PCIe3 LP 2-port 56Gb FDR IB Adapter x16 provides a high- bandwidth InfiniBand adapter with very good latency for applications using this interface. Two QSFP+ ports are provided and use either FDR IB or 40GbE cables/transceivers.

This is a x16 adapter and it physically must be located in a x16 slot in the system unit of scale-out servers. It is not supported in the PCIe Gen3 I/O Drawer nor in the Power E870/E880 server.

	Low-profile tail stock	Full-high tail stock
Linux-only servers	#EL3D	#EL50
Multi-OS servers (running Linux)	#EC32	#EC33

This adapter is supported by Linux. See the feature code description for prerequisite software levels.

2-port 10Gb NIC/RoCE Adapter

The PCIe3 2-port 10GbE NIC/RoCE Adapter is a refresh of the current 10Gb NIC/RoCE Adapter, helping to ensure adapter availability for POWER8 servers. The adapter can be configured for either NIC or for RoCE capability. NIM and Linux Install is supported, an enhancement compared to the existing PCIe2 NIC/RoCE adapters (#EC27/#EC28/#EC29/#EC30).

RoCE can provide a performance and efficiency boost for the applications using the interface. The adapter is available either for SR optical fiber cabling or for copper twinax cabling. Optical transceivers are included with the SR adapter feature. Copper twinax transceivers are included on the separately ordered copper cables.

	Low-profile - SR Optical	Full-high - SR Optical	Low-profile - Copper twinax	Full-high - Copper twinax

```
Linux-only|#EL40      |#EL54        |#EL3X        |#EL53
          |           |             |             |
Multi-OS  |#EC2M      |#EC2N        |#EC37        |#EC38
```

AIX and Linux support this adapter with and without VIOS. IBM i supports the adapter with VIOS. See the feature code description for prerequisite software levels.

Fulfilling the October 2014 SOD, SR-IOV NIC capability is announced for a full range of POWER8 servers, expanding on the Power E870/E880 system node.

SR-IOV can provide more efficient hardware virtualization and can provide quality of service controls improving the manageability of virtualized adapters.

The following Ethernet PCIe adapters are supported with the SR-IOV NIC capability:

```
                        |Low profile|Full high  |Low profile |Full high -
                        |- multi OS |- multi OS|- Linux only|Linux only
------------------------------------------------------------------------
PCIe3 4-port (10GbE+1GbE)|  #EN0J 1  |  #EN0H    |   #EL38    |  #EL56
 SR Optical fiber        |           |           |            |
PCIe3 4-port (10GbE+1GbE)|  #EN0L 1  |  #EN0K    |   #EL3C    |  #EL57
 copper twinax           |           |           |            |
PCIe3 4-port (10GbE+1GbE)|  #EN0N    |  #EN0M    |   N/A      |   N/A
 LR Optical fiber        |           |           |            |
PCIe3 4-port 10GbE       |  #EN16 2  |  #EN15    |   N/A      |   N/A
 SR optical fiber        |           |           |            |
PCIe3 4-port 10GbE       |  #EN18 2  |  #EN17    |   N/A      |   N/A
 copper twinax           |           |           |            |
```

Note: -1 SR-IOV announced February 2015 for Power E870/E880 system node. Now available in other POWER8 servers.
Note: -2 Adapter is only available in Power E870/E880 system node, not 2U server.
These adapters each have four ports, and all four ports are enabled with SR-IOV function. The entire adapter (all four ports) is configured for SR-IOV or none of the ports is.

The client can chose to configure as SR-IOV and assign 100% of a port to one partition. The FCoE capability of the adapter is not supported when using SR-IOV. SR-IOV can provide simple virtualization without VIOS with greater server efficiency as more of the virtualization work is done in the hardware and less in the software. SR-IOV can also provide bandwidth quality of service (QoS) controls to help ensure that client-specified partitions have a minimum level of Ethernet port bandwidth and thus improve the ability to share Ethernet ports more effectively.

As a QoS example, assume there are three partitions: Partition A, B, and C. If Partition A is assigned a minimum of 20% of the bandwidth of a port, Partitions B and C cannot use more than 80% of the bandwidth unless Partition A is using less than 20%. Partition A can use more than 20% if bandwidth is available. This applies to outbound NIC traffic from the port. It does not apply to inbound NIC traffic into the port, but remember that these ports run in full duplex and thus QoS for outgoing traffic remains in effect even with high levels of inbound NIC traffic.

SR-IOV is considered simple virtualization and does not include higher-level virtualization functions provided by VIOS such as Live Partition Mobility. SRIOV can optionally be combined with VIOS to leverage VIOS's higher level of functionality, but continues to provide bandwidth QoS. The portion of the Ethernet port's bandwidth controlled by VIOS would use software virtualization.

The expanded POWER8 SR-IOV NIC capability with a planned availability of June 2015 requires:

- AIX 6.1 TL9 SP5 and APAR IV68443, or later
- AIX 7.1 TL3 SP5 and APAR IV68444, or later
- IBM i 7.1 TR10, or later
- IBM i 7.2 TR2, or later
- Red Hat Enterprise Linux 6.5, or later
- Red Hat Enterprise Linux 7, or later
- SUSE Linux Enterprise Server 11 SP3, or later
- SUSE Linux Enterprise Server 12, or later
- Ubuntu 15.04, or later
- VIOS 2.2.3.51, or later
- Firmware level 8.3, or later

This expanded capability is on the Power scale-out servers, is on the PCIe Gen3 I/O drawer, and with the new 4-port 10Gb Ethernet adapter on the enterprise system node.

IBM Manufacturing is not announcing the capability to preconfigure SR-IOV-capable I/O using SR-IOV. Such hardware will be shipped from IBM when ordered with a server in the same way adapters have been shipped previously. The client will need to configure the SR-IOV capability.

The following POWER8 PCIe slots are SR-IOV capable:

- All Power E870/E880 system node slots.
- Slots C1 and C4 of the 6-slot Fan-out Module in a PCIe Gen3 I/O drawer.
- Slots C6, C7, C10, and C12 of a Power S814 (1S 4U) or S812L (1S 2U) server.
- Slots C2, C3, C4, C5, C6, C7, C10, and C12 of a S824 or S824L server (2-socket, 4U) with both sockets populated. If only one socket is populated, then C6, C7, C10, and C12.
- Slots C2, C3, C5, C6, C7, C10, and C12 of a S822 or S822L server (2-socket, 2U) with both sockets populated. If only one socket is populated, then C6, C7, C10, and C12.

An HMC is required to configure SR-IOV.

e-Config recognizes VIOS is not a prerequisite for Power E870 and E880 system lower-profile feature EN0J and EN0L adapters because of the SR-IOV capability. But e-config will not be updated until June 2, 2015, with the same insight for the full-high feature EN0H/EN0K/EN0M adapters for IBM i configurations. These full-high adapters can be ordered if VIOS is present on the configuration prior to e-config's planned enhancement. e-config recognizes that features EN15, EN16, EN17, and EN18 do not require VIOS for IBM i configurations.

When feature EPXL is configured, SMT may not exceed SMT4.

Installation and operation of systems with feature EPXL will result in greater fan noise than the fan noise of the equivalent IBM machine without feature EPXL. Local regulations may govern noise level exposure in the workplace and surrounding area, and may apply to the client and the client's machine installation. The actual sound pressure levels in the client's installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where the client designates the racks to be installed; the noise levels from other equipment; the room ambient temperature; and employees' location in relation to the equipment. Further, compliance with such government regulations also depends upon a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. IBM recommends that the client consult with qualified experts in this field to determine whether the client's use of machines with feature EPXL is in compliance with the applicable regulations.

Other benefits include the following:

- Bringing together multiple applications and infrastructure workloads in a virtualized environment, consolidating business transaction processing with infrastructure for social and mobile solutions
- Consolidating UNIX and x86 Linux workloads
- Gaining faster insights with the POWER8 processor and smart acceleration enabled by Coherent Accelerator Processor Interface (CAPI) technologies
- Reducing energy consumption by utilizing advanced energy control
The following adapter feature codes are not supported by IBM i: #EJ28, #EN27, and #EN28.

The IBM Power System S822 supports two processor sockets, offering 8-core 4.1 GHz POWER8 Processor Card, 6-core or 12-core 3.89 GHz or 10-core or 20-core 3.42 GHz POWER8 configurations in a 19-inch rack-mount, 2U (EIA units) drawer configuration. All the cores are active.

The Power S822 server supports a maximum of 16 DDR3 CDIMM slots. Memory features supported are 16 GB, 32 GB, and 64 GB and run at speeds of 1600 Mbps, allowing for a maximum system memory of 1024 GB.

- Rich I/O options in the system unit include:
  - Four PCIe G3 x16 LP slots (one CAPI controller per socket at direct PCIe x16 slots from each socket)
  - Four PCIe G3 x8 LP slots (One of the four PCIe G3 x8 LP slots will not be available if the high-function RAID controllers are installed.)
  - Eight 2.5-in. HDD SFF bays and six 1.8-in. SSDs
  - RAID 0, 5, 6, 10, 5T2, 6T2, and 10T2 support
  - One DVD
  - One PCIe G3 x8 slot for 1GbE 4-port LAN controller integrated
- Two front USB 3.0 ports; one rear system port. The front ports are for general use. One rear serial / system port.
- Service processor
- 1+1 Redundant hot-swap ac power supplies in each enclosure
- 19-inch rack-mount 2U configuration
- PowerVM
- Red Hat Enterprise Linux (RHEL) 6.5, or later; SUSE Linux Enterprise Server (SLES) 11 Service Pack 3, or later; AIX 6.1, 7.1, or later operating system support

Summary of standard features for Power S822:

- POWER8 processor modules:
  - 4-core 3.02 GHz
  - 8-core 4.1 GHz
  - 6-core, 3.89 GHz
  - 10-core, 3.42 GHz
- High-performance 1600 Mbps DDR4 ECC memory
  - 16 GB (#EM96), 32 GB (#EM97), or 64 GB (#EM98) memory features
  - Up to 1 TB memory with two Power Systems processor DCMs
  - Up to 512 GB of DDR4 memory with one Power Systems processor DCM

  Note: DDR3 Memory Dimms (features #EM83, EM84, and EM85) are only available as MES.
- Choice of two storage features:
  - Choice one: twelve SFF bays, one DVD bay, one integrated SAS controller without cache, and JBOD RAID 0, 5, 6, or 10
    - Optionally, split the above SFF-3 bays and add a second integrated SAS controller without cache.
  - Choice two: eight SFF-3 bays, one DVD bay, a pair of integrated SAS controllers with cache, and RAID 0, 5, 6, 10, 5T2, 6T2, and 10T2.
    - A 6-bay, 1.8-inch SSD cage with dual IOA.
    - Optionally, attach an EXP24S SAS HDD/SSD Expansion Drawer to the dual IOA.
- Hot-swap PCIe Gen 3 slots
  - Nine(1) slots with two Power Systems processor DCMs: four x16 slots and five (2) x8 slots
  - Six (1) slots with one Power Systems processor DCM: two x16 slots and four (2) x8 slots
    Note: (1) One fewer PCIe slot is available with the dual IOA storage backplane feature EJ0U.
    Note: (2) One x8 PCIe slot is used for integrated LAN adapter.
- Integrated:
  - Service processor
  - EnergyScale technology
  - Hot-swap and redundant cooling
  - Two USB 3.0 ports for general use
  - Two USB 2.0 ports for non-general use
  - Two HMC 1GbE RJ45 ports
  - One system port with RJ45 connector
- Two hot plug, redundant power supplies
- 19-inch rack-mounting hardware (2U)

PowerVM

IBM PowerVM, which delivers industrial-strength virtualization for IBM AIX and Linux environments on IBM POWER processor-based systems, has been enhanced with a virtualization-oriented performance monitor and performance statistics are available through the HMC. These performance statistics can be used to understand the workload characteristics and to prepare for capacity planning.

Power S822 system configuration

The minimum Power S822 initial order must include a processor module, 32 GB of memory, memory activations, a storage backplane, one HDD or SSD, a PCIe2 4-port 1GbE adapter, two power supplies and line cords, an operating system indicator, a cover set indicator, and a Language Group Specify.

AIX or Linux is the primary operating system. The minimum defined initial order configuration is as follows:

```
Feature number    Description
--------------    ---------------------------------------------------
EPXL              8-core 4.1 GHz POWER8 Processor Card
EPYL              One Processor Core Activation for #EPXL
EPX1              6-core 3.89 GHz POWER8 Processor module
EPY1              Processor core entitlement activations for EPY1
                  to equal total processors cores ordered
EM96 X 2          16 GB DDR4 Memory
EJ0T              Storage Backplane: 12 SFF-3 Bays and DVD Bay,
                  JBOD, RAID 0, 5, 6, 10
ESDT x 1          146 GB 15k RPM SAS SFF-3 Disk Drive for AIX/Linux
EB2M x 2          CEC AC Power Supply - 1400W
5260              PCIe2 LP 4-port 1GbE Adapter
6458 x 2          Power Cord 4.3 m (14-ft), Drawer to Wall/IBM
                  PDU (250V/10A)
9300/97xx         Language Group Specify
EJT4              Front Bezel for 12-Bay BackPlane
2146              Primary Operating System Indicator - AIX
2147              Primary Operating System Indicator - Linux
```

Notes:

- The racking approach for the initial order must be either a 7014-T00, 7014-T42, or 7953-94Y. If an additional rack is required for I/O expansion drawers as an MES to an existing system, either a feature 0551, 0553, or ER05 rack must be ordered.

- No internal HDD or SSD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel adapter must be ordered if feature 0837 is selected.

- #5260 is the default a 1 Gb Ethernet adapter. Options of a 10GB Ethernet adapter include one of either #EN0J, #EN0L, #EN0T, #EN0V or #EN0X.

Processor modules

A maximum of one processor with four processor cores (#EPXN) or four processor cores (#EPXL) or a maximum of two processors of either six processor cores (#EPX1) or ten processor cores (#EPXD) are allowed. All processor cores must be activated. The following defines the allowed quantities of processor activation entitlements.

- One 4-core 3.02 GHz processor (#EPXN) require that four processor activation codes be ordered. A maximum of four processor activations (#EPYN) is allowed.

- One 8-core 4.1 GHz processors (#EPXL) require that eight processor activation codes be ordered. A maximum of eight processor activations (#EPYL) is allowed.

- Two 8-core 4.1 GHz processors (#EPXL) require that sixteen processor activation codes be ordered. A maximum of sixteen processor activations (#EPYL) is allowed.

- One 6-core, 3.891 GHz processor (#EPX1) requires that six processor activation codes be ordered. A maximum of six processor activation code features (#EPY1) is required.

- Two 6-core, 3.891 GHz processors (#EPX1) require that twelve processor activation codes be ordered. A maximum of twelve processor activation code features (#EPY1) is required.

- One 10-core, 3.425 GHz processor (#EPXD) requires that ten processor activation codes be ordered. A maximum of ten processor activation code features (#EPY1) is required.

- Two 10-core, 3.425 GHz processors (#EPXD) requires that twenty processor activation codes be ordered. A maximum of twenty processor activation code features (#EPY1) is required.

System memory

- A minimum 32 GB of memory is required on the Power S822 system.
- Memory upgrades require memory pairs. Base memory is two 16 GB, 1600 Mbps DDR4 memory modules (#EM96).

Plans for future memory upgrades should be taken into account when deciding which memory feature size to use at the time of initial system order.

```
              Memory features
```

Feature	Feature number	Minimum DIMM quantity	Maximum DIMM quantity
16 GB 1600 Mbps	EM96	0	16
32 GB 1600 Mbps	EM97	0	16
64 GB 1600 Mbps	EM98	0	16

Power supply

- Two power supplies supporting a rack: 1+1 1400 Watt 200-240 Volt (#EB2M)

Redundant fans

Redundant fans are standard.

Power cords

Two power cords are required. A maximum of two feature 6458 cords is allowed on the system unless a valid I/O drawer or tower is attached to the system. The Power S822 supports power cord 4.3m (14-ft), Drawer to Wall/IBM PDU (250V/10A) in the base ship group. Refer to the feature listing for other options.

I/O support

The following I/O is supported.

PCIe slots

The Power S822 has up to nine PCIe hot plug Gen 3 slots, providing excellent configuration flexibility and expandability. For even more PCIe slots, see the Statement of direction section for an I/O drawer with PCIe slots.

With two POWER8 processor dual-chip modules (DCM), nine PCIe Gen 3 slots are available. Four are x16 Low Profile and full-length slots. Five are x8 Gen 3 Low Profile, half-length slots.

With one POWER8 processor DCM, six PCIe Gen 3 slots are available. Two are x16 Low Profile and full-length slots. Four are x8 Gen 3 Low Profile, half-length slots.

The x16 slots can provide up to twice the bandwidth of x8 slots because they offer twice as many PCIe lanes. PCIe Gen 3 slots can support up to twice the bandwidth of a PCIe Gen 2 slot and up to four times the bandwidth of a PCIe Gen 1 slot, assuming an equivalent number of PCIe lanes.

At least one PCIe Ethernet adapter is required on the server by IBM to ensure proper manufacture, test, and support of the server. One of the x8 PCIe slots is used for this required adapter, identified as the C10 slot.

These servers are smarter about energy efficiency for cooling the PCIe adapter environment. They sense which IBM PCIe adapters are installed in their PCIe slots and if an adapter requires higher levels of cooling, they automatically speed up fans to increase airflow across the PCIe adapters. In contrast, POWER7 servers required the user to enter a "non-acoustic mode" command to speed up the fans. Note that faster fans increase the sound level of the server. Higher wattage PCIe adapters include the PCIe3 SAS adapters, PCIe2 SAS adapters and SSD/flash PCIe adapters (#EJ0J, #EJ0M, #EL3B, #EJ0L, #ESA1, #ESA2, #ESA3, and #5913).

IBM is also introducing a gzip acceleration adapter (#EJ13). This PCIe adapter incorporates the latest in FPGA technology to provide significant performance improvements for customers running workloads such as IBM WebSphere, which requires frequent gzip compressions and decompressions. Customers running Java workloads using java/util/gzip will also see impressive performance improvements. This feature is particularly effective for workloads requiring transfer of large buffers. Utilizing this adapter can reduce both storage requirements and network congestion in a customer's environment. This feature is only supported in AIX.

SAS bays and storage backplane options

Three backplane options provide a great deal of flexibility and capability. One of these three must be configured:

- Storage Backplane 12 SFF-3 Bays/DVD Bay (#EJ0T)
- Features EJ0T and EJ0V (split backplane)
- Storage Backplane 8 SFF-3 Bays/six 1.8-inch SSD bays/DVD Bay/Dual IOA with Write Cache and Easy Tier functionality (#EJ0U)

Each of the three backplane options provides SFF-3 SAS bays in the system unit. These 2.5-inch or small form factor (SFF) SAS bays can contain SAS drives (HDD or SSD) mounted on a Gen 3 tray or carrier. Thus the drives are designated SFF-3. SFF-1 or SFF-2 drives do not fit in an SFF-3 bay. All SFF-3 bays support concurrent maintenance or "hot plug" capability.

Each of the three backplane options uses leading-edge, integrated SAS RAID controller technology designed and patented by IBM. A custom-designed PowerPC based ASIC chip is the basis of these SAS RAID controllers and provides industry-leading RAID 5 and RAID 6 performance levels, especially for SSD. Internally, 13 (no cache) or 16 (with cache) 6Gb SAS ports are implemented and provide plenty of bandwidth. Similar SAS RAID technology was first introduced with the PCIe Gen 3 SAS controller, features EJ0J and EJ0L. The integrated SAS controllers are placed in dedicated slots and do not reduce he number of available PCIe slots.

The feature EJ0T Storage Backplane option provides twelve SFF-3 bays, one SAS controller with zero write cache, and a DVD drive bay.

By optionally adding the feature EJ0V Split Backplane, a second integrated SAS controller with no write cache is provided and the twelve SSF-3 bays are logically divided into two sets of six bays. Each SAS controller independently runs one of the six-bay sets of drives.

The feature EJ0U storage backplane option has expanded function compared to the feature EJ0T backplane. Feature EJ0U provides eight SSF-3 bays; a pair of integrated SAS controllers, each with 1.8 GB physical (effectively up to 7.2 GB with compression) 3 GB write cache; a DVD bay; two SAS ports enabled for attaching an external feature 5887 EXP24S Drawer; a six-bay 1.8-inch SSD Cage (#EJTL), and Easy Tier functionality. The external SAS ports are physically mounted on the rear of the server and use up one PCIe x8 slot. The SSD cage is indicated by the EJTL feature number and can only be ordered with feature EJ0U.

The dual SAS controllers provide both performance and protection advantages. Patented Active-Active capabilities enhance performance when there is more than one array configured. Each of the dual controllers has access to all the backplane SAS bays and can back up the other controller if there were to be a problem with the other controller. Each controller mirrors the other's write cache, providing redundancy protection. Integrated flash memory for the write cache content provides protection against electrical power loss to the server and avoids the need for write cache battery protection and battery maintenance.

All three of these backplane options support HDDs or SSDs or a mixture of HDDs and SSDs in the SFF-3 bays. "Mixing" HDD and SSD applies even within a single set of six bays of the split backplane option. Note, if mixing HDDs and SSDs, they must be in separate arrays (unless using Easy Tier function).

All three of these backplane options can offer different drive protection options: RAID 0, RAID 5, RAID 6, or RAID 10. RAID 5 requires a minimum of three drives of the same capacity. RAID 6 requires a minimum of four drives of the same capacity. RAID 10 requires a minimum of two drives. Hot spare capability is supported with RAID 5 or RAID 6. The high-performance, expanded-function dual-IOA backplane also proves Easy Tier functionality which is also called RAID 5T2 (2-tiered RAID 5), RAID 6T2 (2-tiered RAID 6) and RAID 10T2 (2-tiered RAID 10).
Note: I/O performance-sensitive workloads with an appreciable percentage of writes should consider using the feature EJ0U backplane with SAS controllers with write cache or use PCIe SAS adapters with write cache, especially for HDDs. Note also that RAID 5 and RAID 6 result in more drive write activity than mirroring or than unprotected drives.

All three of these backplane options are supported by AIX, Linux, and VIOS. It is highly recommended the drives be protected, but not required.

If the client needs a change after the server is already installed, the backplane option can be changed. For example, the feature EJ0V split backplane feature can be added to an existing feature EJ0T backplane. Or the feature EJ0T backplane can be removed and replaced by the expanded-function dual IOA feature EJ0U backplane. Or a feature EJ0U backplane could be replaced by a feature EJ0T and EJ0V backplane.

Unlike the hot plug PCIe slots and SAS bays, concurrent maintenance is not available for the integrated SAS controllers. Scheduled downtime is required if a service action is required for these integrated resources.

SSD cage

In addition to supporting HDDs and SSDs in the SFF-3 SAS bays, the expanded-function feature EJ0P supports the 6-bay, 1.8-inch SSD Cage (#EJTL) and the optional attachment of an EXP24S drawer. All six bays are accessed by both of the integrated SAS controllers. The bays support concurrent maintenance (hot plug). SSD 1.8-inch drives such as the 387 GB capacity features ES16 or ES17 are supported.

DVD drive bay

Included in the feature EJ0T or EJ0U backplanes is a slimline media bay that can optionally house a SATA DVD-RAM (#5771). The DVD drive is run by the integrated SAS controllers, and a separate PCIe adapter is not required.

Storage Backplane Integrated Easy Tier function

The Easy Tier function is provided with the dual IOA, high-performance storage backplane (#EJ0U). Conceptually, this function is like the Easy Tier function found in the IBM Storage products such as the DS8000, Storwize V7000, or SVC, but implemented just within the integrated Power Systems SAS controllers, the integrated SAS bays, and, optionally, an EXP24S I/O drawer. Hot data is automatically moved to SSD, and cold data is automatically moved to disk (HDD) in an AIX, Linux, or VIOS environment. No user application coding is required.

Clients commonly have this hot/cold characteristic for their data. It is typical for 10% - 20% of the data to be accessed 80% - 90% of the time. This is called the hot data. If you can get the hot data onto SSDs, it can dramatically improve the performance of I/O-bound applications. By keeping the cold data on HDDs, the total cost per gigabyte of the solution can be minimized. You can end up with high I/O performance at a very reasonable price. By avoiding the need for lots of HDD arms for performance, you can reduce the number of I/O drawers, maintenance, rack/floor space, and energy.

On a 2U server, up to 16 internal HDD/SSD SAS bays and, optionally, with the EXP24S drawer, an additional 24 SAS bays are supported with the integrated Easy Tier function.

Easy Tier function is configured using RAID 5T2 (2-tiered RAID-5), RAID 6T2 (2-tiered RAID-6) or RAID 10T2 (2-tiered RAID-10). HDD and SSD are combined in the same array and the controller or adapter swaps 1M or 2M bands of data between HDD and SSD, automatically moving the hot data to SSD and the cold data to SSD. The HDD and SSD can be different capacities in this array. If an array has multiple capacity points, for example, 300 GB HDD and 600 GB HDD, only 300 GB of the larger 600 GB HDD will be used. Similarly, if the array has 387 GB SSD and 775 GB SSD, only 387 GB of the 775 GB will be used. Note that the block size of the drives in the array must match. All drives must be 5xx byte sectors or all must be 4k byte sectors.

Easy Tier function requires AIX 7.1 TL3 SP3, or later; AIX 6.1 TL9 SP3, or later; RHEL 6.5, or later; SLES 11 SP3, or later; or VIOS 2.2.3.3, or later.

I/O drawer attachment

The EXP24S SAS HDD/SSD Expansion Drawer (#5887) is attached to SAS ports on either a PCIe SAS adapter located in the server or to the SAS ports on the rear of the server. Two SAS ports on the rear of the server are enabled with the expanded-function storage backplane with dual IOA support.

- One feature 5887 EXP24S drawer in mode 1 can be attached to the two SAS ports on the rear of the server using two SAS YO cables such as feature ECBT, ECBU, ECBV, or ECBW. Either SSDs or HDDs can be placed in this drawer, but SSDs and HDDs cannot be mixed in this drawer.
- The feature 5887 EXP24S drawer can be attached to SAS ports of PCIe SAS adapters using SAS YO or X cables. Up to 14 EXP24S drawers can be attached. The specific SAS cables used will depend on the specific adapter selected and drawer mode selected. Either SSDs or HDDs can be placed in the drawer, depending on the capabilities of the adapter running the bays. Note that longer distance SAS cables are thicker and can fill the Cable Management Arm more quickly.

Clients migrating from earlier generation servers may have been using I/O drawers such as the GX++ attached feature 5802 or 5877 PCIe 12X I/O Drawers with PCIe Gen 1 slots. Though most PCIe adapters in the feature 5802 or 5877 can be moved to this server and its disk drives converted and moved to the feature 5887 EXP24S drawer, the feature 5802 and 5877 drawers are not supported on this newer Power Systems server built with POWER8 based technology. Similarly, the GX++ attached EXP30 Ultra SSD Drawer (#EDR1 or #5888) is not supported.

The older 3.5-inch-based feature 5886 EXP12S SAS Disk Drawer and feature 5786 EXP24 SCSI Disk Drawer are not supported.

IBM offers a 1U multimedia drawer that can hold one or more DVDs, tape drive, or RDX docking stations. The 7226-1U3 is the most current offering. The earlier 7216-1U2 and 7214-1U2 are also supported. Up to six of these multimedia drawers can be attached.

Cable management arm

A folding arm is attached to the server's rails at the rear of the server. The server's power cords and the cables from the PCIe adapters or integrated ports run through the arm and into the rack. The arm enables the server to be pulled forward on its rails for service access to PCIe slots, memory, processors, and so on without disconnecting the cables from the server. Approximately 1 meter or 3 feet of cord/cable length is needed for the arm.

Integrated I/O ports

In addition to the integrated SAS controllers and SAS ports associated with the storage backplane, there are two HMC ports, one system port, and four USB ports. The two HMC ports are RJ45 supporting 1Gb Ethernet connections.

The one system port is RJ45 and is supported by AIX and Linux for attaching serial devices such as an asynchronous device like a console. If the device does not have a RJ45 connection, a converter cable such as feature 3930 can provide a 9-pin D-shell connection. Note that serial devices can have very individual characteristics (different pin outs) and the feature 3930 may not be appropriate for all possible devices. In this case, the user should acquire an OEM converter cable appropriate for their device.

Two USB-3 ports are available for general client use and two USB-2 ports are available for limited client use. Two USB-3 ports are located on the front of the server and two USB-2 ports are on the rear. The USB-2 ports are on the service processor card and there primarily for IBM use. A converter cable #ECCF provides a USB-to-9-pin D-Shell connection for this function.

Rack-integrated system with Expansion Drawer

Regardless the rack-integrated system to which the PCIe Gen3 I/O Expansion Drawer is attached to, if the Expansion Drawer is ordered as factory integrated, the PDUs in the rack will be defaulted to be placed horizontally to enhance cable management.

Expansion Drawers complicate the access to vertical PDUs if located at the same height. IBM recommends accommodating PDUs horizontally on racks containing one or more PCIe Gen3 I/O Expansion Drawers.

Once the rack with Expansion Drawers is delivered to the customer, the customer is allowed to rearrange the PDUs from horizontal to vertical. However, the configurator will remain considering the PDUs are placed horizontally for the matter of calculating the free space still available in the rack.

Vertical PDUs can be used only if CSRP (#0469) is on the order. When specifying CSRP, the customer will provide the locations where the PCIe Gen3 I/O Expansion Drawers must be placed, avoiding locating those adjacent to Vertical PDU locations, EIA 6 through 16 and 21 through 31.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.h tml

Reliability, fault tolerance, and data correction

The reliability of systems starts with components, devices, and subsystems that are designed to be highly reliable. During the design and development process, subsystems go through rigorous verification and integration testing processes. During system manufacturing, systems go through a thorough testing process to help ensure the highest level of product quality.

Memory subsystem RAS

The memory has error detection and correction circuitry designed such that the failure of any one specific memory module within an ECC word by itself can be corrected absent any other fault.

In addition, a spare DRAM per rank on each memory port provides for dynamic DRAM device replacement during runtime operation. Also, dynamic lane sparing on the DMI link allows for repair of a faulty data lane.

Other memory protection features include retry capabilities for certain faults detected at both the memory controller and the memory buffer. Memory is also periodically scrubbed to allow for soft errors to be corrected and for solid single-cell errors reported to the hypervisor, which supports operating system deallocation of a page associated with a hard single-cell fault.

Mutual surveillance

The service processor monitors the operation of the firmware during the boot process and also monitors the hypervisor for termination. The hypervisor monitors the service processor and reports service reference code when it detects surveillance loss. In the PowerVM environment, it will perform a reset/reload if it detects the loss of the service processor.

Environmental monitoring functions

The Power Systems family does ambient and over temperature monitoring and reporting.

Availability enhancement functions

The Power Systems family continues to offer and introduce significant enhancements designed to increase system availability.

POWER8 processor functions

As in POWER6, POWER7, and POWER7+, the POWER8 processor has the ability to do processor instruction retry for some transient errors and alternate processor recovery for a number of core-related faults. This significantly reduces exposure to both hard (logic) and soft (transient) errors in the processor core. Soft failures in the processor core are transient (intermittent) errors, often due to cosmic rays or other sources of radiation, and generally are not repeatable. When an error is encountered in the core, the POWER8 processor will first automatically retry the instruction. If the source of the error was truly transient, the instruction will succeed and the system will continue as before. On IBM systems prior to POWER6, this error would have caused a checkstop.

Hard failures are more difficult, being true logical errors that will be replicated each time the instruction is repeated. Retrying the instruction will not help in this situation. As in POWER6, POWER7, and POWER7+ technology, processors have the ability to extract the failing instruction from the faulty core and retry it elsewhere in the system for a number of faults, after which the failing core is dynamically deconfigured and called out for replacement in the PowerVM environment. These features are designed to avoid a full system outage.

As in POWER6 and POWER7+, the POWER8 processor includes single processor check stopping for certain faults that cannot be handled by the availability enhancements described in the preceding section. This significantly reduces the probability of any one processor affecting total system availability.

Partition availability priority

Also available is the ability to assign availability priorities to partitions. In the PowerVM environment, if an alternate processor recovery event requires spare processor resources in order to protect a workload, when no other means of obtaining the spare resources is available, the system will determine which partition has the lowest priority and attempt to claim the needed resource. On a properly configured POWER8 processor-based server, this allows that capacity to be first obtained from, for example, a test partition instead of a financial accounting system.

Cache availability

The L2 and L3 caches in the POWER8 processor and L4 cache in the memory buffer chip are protected with double-bit detect, single-bit correct error detection code (ECC). In addition, a threshold of correctable errors detected on cache lines can result in the data in the cache lines being purged and the cache lines removed from further operation without requiring a reboot in PowerVM environment. In addition, the L3 cache has the ability to dynamically substitute a spare bit-line for a faulty bit-lane, allowing an entire faulty "column" of cache, impacting multiple cache lines, to be repaired. An ECC uncorrectable error detected in these caches can also trigger a purge and delete of cache lines. This results in no loss of operation if the cache lines contained data unmodified from what was stored in system memory.

Modified data would be handled through Special Uncorrectable Error handling. L1 data and instruction caches also have a retry capability for intermittent errors and a cache set delete mechanism for handling solid failures.

Special Uncorrectable Error handling

Special Uncorrectable Error (SUE) handling prevents an uncorrectable error in memory or cache from immediately causing the system to terminate. Rather, the system tags the data and determines whether it will ever be used again. If the error is irrelevant, it will not force a check stop. If the data is used, termination may be limited to the program/kernel or hypervisor owning the data; or the I/O adapters controlled by an I/O hub controller would freeze if data were transferred to an I/O device.

PCI extended error handling

PCI extended error handling (EEH)-enabled adapters respond to a special data packet generated from the affected PCI slot hardware by calling system firmware, which will examine the affected bus, allow the device driver to reset it, and continue without a system reboot. For Linux, EEH support extends to the majority of frequently used devices, although some third-party PCI devices may not provide native EEH support.

Predictive failure and dynamic component deallocation

Servers with Power processors have long had the capability to perform predictive failure analysis on certain critical components such as processors and memory. When these components exhibit certain symptoms that may indicate a failure is imminent, the system can dynamically deallocate and call home, when enabled, about the failing part before the error is propagated system-wide. In many cases, the system will first attempt to reallocate resources in such a way that will avoid unplanned outages. In the event that insufficient resources exist to maintain full system availability, these servers will attempt to maintain partition availability by user-defined priority.

Uncorrectable error recovery

When the auto-restart option is enabled, the system can automatically restart following an unrecoverable software error, hardware failure, or environmentally induced (ac power) failure.

Serviceability

The purpose of serviceability is to efficiently repair the system while attempting to minimize or eliminate impact to system operation. Serviceability includes system installation, MES (system upgrades/downgrades), and system maintenance/repair. Depending upon the system and warranty contract, service may be performed by the customer, an IBM representative, or an authorized warranty service provider.

The serviceability features delivered in this system provide a highly efficient service environment by incorporating the following attributes:

- Design for Customer Set Up (CSU), Customer Installed Features (CIF), and Customer Replaceable Units (CRU)
- Detection and Fault Isolation (ED/FI)
- First Failure Data Capture (FFDC)
- Lightpath service indicators:
  - Service labels and service diagrams available on the system and delivered through IBM Knowledge Center
  - Step-by-step service procedures documented in IBM Knowledge Center or available through the Hardware Management Console
  - CRU videos planned to be available on the web at general availability
  - Mobile access to important customer service functions available by scanning a QR label

Service environment

In the PowerVM environment, the HMC is a dedicated server that provides functions for configuring and managing servers for either partitioned or full-system partition using a GUI or command-line interface (CLI). An HMC attached to the system allows support personnel (with client authorization) to remotely log in to review error logs and perform remote maintenance if required.

The POWER8 processor-based platforms support two main service environments:

- Attachment to one or more HMCs is a supported option by the system with PowerVM. This is the default configuration for servers supporting logical partitions with dedicated or virtual I/O. In this case, all servers have at least one logical partition.
- No HMC. There are two service strategies for non-HMC systems.
  - Full-system partition with PowerVM: A single partition owns all the server resources and only one operating system may be installed.
  - Partitioned system with PowerVM: In this configuration, the system can have more than one partition and can be running more than one operating system. In this environment, partitions are managed by the Integrated Virtualization Manager (IVM), which provides some of the functions provided by the HMC.

Service interface

The service interface allows support personnel to communicate with the service support applications in a server using a console, an interface, or a terminal. Delivering a clear, concise view of available service applications, the service interface allows the support team to manage system resources and service information in an efficient and effective way. Applications available through the service interface are carefully configured and placed to give service providers access to important service functions.

Different service interfaces are used, depending on the state of the system, hypervisor, and operating environment. The primary service interfaces are:

- LEDs
- Operator Panel
- Service Processor menu
- Operating system service menu
- Service Focal Point on the HMC with PowerVM
- Service Focal Point Lite on IVM with PowerVM

In the light path LED implementation, the system can clearly identify components for replacement by using specific component-level LEDs, and can also guide the servicer directly to the component by signaling (turning on solid) the amber system fault LED, enclosure fault LED, and component FRU fault LED. The servicer can also use the identify function to blink the FRU-level LED. When this function is activated, a roll-up to the blue enclosure locate and system locate LEDs will occur. These LEDs will turn on solid and can be used to follow the light path from the system to the enclosure and down to the specific FRU in the PowerVM environment.

First Failure Data Capture and error data analysis

First Failure Data Capture (FFDC) is a technique that helps ensure that when a fault is detected in a system, the root cause of the fault will be captured without the need to re-create the problem or run any sort of extending tracing or diagnostics program. For the vast majority of faults, a good FFDC design means that the root cause can also be detected automatically without servicer intervention.

FFDC information, error data analysis, and fault isolation are necessary to implement the advanced serviceability techniques that enable efficient service of the systems and to help determine the failing items.

In the rare absence of FFDC and Error Data Analysis, diagnostics are required to re-create the failure and determine the failing items.

Diagnostics

General diagnostic objectives are to detect and identify problems so they can be resolved quickly. Elements of IBM's diagnostics strategy include:

- Provide a common error code format equivalent to a system reference code with PowerVM, system reference number, checkpoint, or firmware error code.
- Provide fault detection and problem isolation procedures. Support remote connection ability to be used by the IBM Remote Support Center or IBM Designated Service.
- Provide interactive intelligence within the diagnostics with detailed online failure information while connected to IBM's back-end system.

Automatic diagnostics

Because of the FFDC technology designed into IBM servers, it is not necessary to perform re-create diagnostics for failures or require user intervention. Solid and intermittent errors are designed to be correctly detected and isolated at the time the failure occurs. Runtime and boot-time diagnostics fall into this category.

Stand-alone diagnostics with PowerVM

As the name implies, stand-alone or user-initiated diagnostics requires user intervention. The user must perform manual steps, including:

- Booting from the diagnostics CD, DVD, USB, or network
- Interactively selecting steps from a list of choices

Concurrent maintenance

The determination of whether a firmware release can be updated concurrently is identified in the readme information file that is released with the firmware. An HMC is required for the concurrent firmware update with PowerVM. In addition, hot plugging of PCIe adapters is supported with PowerVM. Concurrent maintenance of the Operator Panel is supported through ASMI.

Service labels

Service providers use these labels to assist them in performing maintenance actions. Service labels are found in various formats and positions and are intended to transmit readily available information to the servicer during the repair process. Following are some of these service labels and their purpose:

- Location diagrams: Location diagrams are located on the system hardware, relating information regarding the placement of hardware components. Location diagrams may include location codes, drawings of physical locations, concurrent maintenance status, or other data pertinent to a repair. Location diagrams are especially useful when multiple components such as DIMMs, CPUs, processor books, fans, adapter cards, LEDs, and power supplies are installed.
- Remove/replace procedures: Service labels that contain remove/replace procedures are often found on a cover of the system or in other spots accessible to the servicer. These labels provide systematic procedures, including diagrams, detailing how to remove or replace certain serviceable hardware components.
- Arrows: Numbered arrows are used to indicate the order of operation and the serviceability direction of components. Some serviceable parts such as latches, levers, and touch points need to be pulled or pushed in a certain direction and in a certain order for the mechanical mechanisms to engage or disengage. Arrows generally improve the ease of serviceability.

Packing for service

The following service enhancements are included in the physical packaging of the systems to facilitate service:

- Color coding (touch points): Terracotta-colored touch points indicate that a component (FRU/CRU) can be concurrently maintained. Blue-colored touch points delineate components that are not concurrently maintained -- those that require the system to be turned off for removal or repair.
- Tool-less design: Selected IBM systems support tool-less or simple tool designs. These designs require no tools or simple tools such as flathead screw drivers to service the hardware components.
- Positive retention: Positive retention mechanisms help to assure proper connections between hardware components such as cables to connectors, and between two cards that attach to each other. Without positive retention, hardware components run the risk of becoming loose during shipping or installation, preventing a good electrical connection. Positive retention mechanisms like latches, levers, thumb-screws, pop Nylatches (U-clips), and cables are included to help prevent loose connections and aid in installing (seating) parts correctly. These positive retention items do not require tools.

Error handling and reporting

In the event of system hardware or environmentally induced failure, the system runtime error capture capability systematically analyzes the hardware error signature to determine the cause of failure. The analysis result will be stored in system NVRAM. When the system can be successfully restarted either manually or automatically, or if the system continues to operate, the error will be reported to the operating system. Hardware and software failures are recorded in the system log. When an HMC is attached in the PowerVM environment, an ELA routine analyzes the error, forwards the event to the Service Focal Point (SFP) application running on the HMC, and notifies the system administrator that it has isolated a likely cause of the system problem. The Service Processor event log also records unrecoverable checkstop conditions, forwards them to the SFP application, and notifies the system administrator.

The system has the ability to call home through OS to report platform recoverable errors and errors associated with PCI adapters/devices.

In the IVM environment, call home is supported through an IVM partition.

Call home in the PowerKVM environment requires the Host VM to send SNMP alerts for serviceable errors to a central site ESA application running on another server or on a hosted guest, which will initiate the call home on behalf of the KVM Linux host. Available August 29, 2014

the HMC managed environment, a call home service request will be initiated and the pertinent failure data with service parts information and part locations will be sent to an IBM service organization. Customer contact information and specific system-related data such as the machine type, model, and serial number, along with error log data related to the failure, are sent to IBM Service.

Live Partition Mobility

With Live Partition Mobility, users can migrate an AIX, Linux, or IBM i partition running on one POWER partition system to another POWER system without disrupting services. The migration transfers the entire system environment, including processor state, memory, attached virtual devices, and connected users. It provides continuous operating system and application availability during planned partition outages for repair of hardware and firmware faults.

Service processor

The service processor provides the capability to diagnose, check the status of, and sense the operational conditions of a system. It runs on its own power boundary and does not require resources from a system processor to be operational to perform its tasks.

Under PowerVM the service processor supports surveillance of the connection to the HMC and to the system firmware (hypervisor). It also provides several remote power control options, environmental monitoring, reset, restart, remote maintenance, and diagnostic functions, including console mirroring. The service processors menus (ASMI) can be accessed concurrently with system operation, allowing nondisruptive abilities to change system default parameters.

Call home

Call home refers to an automatic or manual call from a customer location to the IBM support structure with error log data, server status, or other service-related information. Call home invokes the service organization in order for the appropriate service action to begin. Call home can be done through HMC or most non-HMC managed systems through Electronic Service Agent running on top of the operating system. While configuring call home is optional, clients are encouraged to implement this feature in order to obtain service enhancements such as reduced problem determination and faster and potentially more accurate transmittal of error information. In general, using the call home feature can result in increased system availability. The Electronic Service Agent application can be configured for automated call home. Refer to the next section for specific details on this application.

IBM Electronic Services

Electronic Service Agent and the IBM Electronic Services web portal comprise the IBM Electronic Services solution, which is dedicated to providing fast, exceptional support to IBM customers. IBM Electronic Service Agent is a no-charge tool that proactively monitors and reports hardware events such as system errors, performance issues, and inventory. Electronic Service Agent can help focus on the customer's company business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues.

System configuration and inventory information collected by Electronic Service Agent also can be viewed on the secure Electronic Services web portal and used to improve problem determination and resolution between the customer and the IBM support team. As part of an increased focus to provide even better service to IBM customers, Electronic Service Agent tool configuration and activation comes standard with the system. In support of this effort, a new HMC External Connectivity security whitepaper has been published, which describes data exchanges between the HMC and the IBM Service Delivery Center (SDC) and the methods and protocols for this exchange. To read the whitepaper and prepare for Electronic Service Agent installation, go to the "Security" section at

http://www.ibm.com/support/esa

Note: Select your country. Click "IBM Electronic Service Agent Connectivity Guide."
Benefits: increased uptime

Electronic Service Agent is designed to enhance the warranty and maintenance service by providing faster hardware error reporting and uploading system information to IBM Support. This can optimize the time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. And 24x7 monitoring and reporting means no more dependency on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security

The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM. The Electronic Service Agent tool is designed to securely transmit either via the Internet (HTTPS or VPN) or modem to provide customers a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into a customer's system.

For additional information, refer to IBM Electronic Service Agent

http://www-01.ibm.com/support/esa/
More accurate reporting

Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, customers are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support

Using the IBM ID entered during activation, customers can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Services website.

The Electronic Services web portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This web portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The newly improved My Systems and Premium Search functions make it even easier for Electronic Service Agent-enabled customers to track system inventory and find pertinent fixes.

My Systems provides valuable reports of installed hardware and software using information collected from the systems by IBM Electronic Service Agent. Reports are available for any system associated with the customer's IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Service Agent information that has been collected from the system, customers are able to see search results that apply specifically to their systems.

For more information on how to utilize the power of IBM Electronic Services, visit the following website or contact an IBM Systems Services Representative

http://www.ibm.com/support/electronic

Product positioning

IBM Power S822 server solutions and services, designed for midsized businesses, help your business capitalize on new opportunities, manage business risk while meeting high service levels, and keep within tight budget constraints.

Mobile

Worklight on Power provides a mobile application platform to speed development and ongoing management of mobile applications, enabling our clients to extend their business to mobile devices. It includes a comprehensive development environment, mobile-optimized runtime middleware, a private enterprise application store, and an integrated management and analytics console. Worklight on Power enables clients to:

- Simplify operations and reduce complexity by co-locating applications on a more scalable and reliable server
- Streamline access to data and applications with secure, high-performance virtual networking
- Grow seamlessly and accelerate deployment of new applications and services
- Reduce overhead by leveraging existing production and disaster recovery infrastructure

Analytics

IBM Power Analytics solutions give organizations with high volumes of data the building blocks they need to implement capabilities that enable them to quickly make data-driven business decisions. Each solution can be implemented separately or in combination to deliver a reliable and high-performance infrastructure for business intelligence (BI) and predictive analytics. The software is installed and configured on the server before being shipped, reducing the time and effort required to gain the benefits of the solution. These analytics solutions are available for any new POWER8 processor-based system:

- IBM Solution for Analytics Power Systems Edition
- IBM BLU Acceleration Power Systems Edition

IBM Solution for Analytics Power Systems Edition is a flexible, integrated solution that provides options to preload and configure one or more IBM analytics applications with data warehouse acceleration. IBM Solution for Analytics Power Systems Edition delivers Cognos Business Intelligence capabilities on POWER8 processor-based servers running AIX or Linux. Cognos Business Intelligence is designed to help business users, executives, and analysts in an organization understand the business and make smarter decisions. The solution offers a full range of BI capabilities, including reports, analysis, dashboards, scorecards, mobile BI, and more.

IBM Solution for Analytics Power Systems Edition also delivers SPSS predictive analytics combined with business rules capabilities on a Power server platform running AIX. SPSS Modeler, SPSS Collaboration and Deployment Services, and Analytical Decision Management help empower organizations to make the right decision each time for high-demand, mission-critical business requirements. This solution combines and integrates predictive analytics, rules, scoring, and optimization techniques into an organization's processes to deliver recommended actions at the point of impact.

BLU Acceleration Power Systems Edition is updated to deliver DB2 dynamic in-memory, columnar data warehouse acceleration on a POWER8 processor-based server running AIX. BLU Acceleration is an integral part of DB2 Advanced Workgroup Edition and Advanced Enterprise Edition, enabling organizations to use both row-based and columnar data storage simultaneously. With BLU Acceleration, organizations can dramatically reduce the time to get analytic query results and reports from existing data warehouses. Time and effort to set up analytics is reduced by eliminating the need for aggregates, indexes, tuning, and partitions. InfoSphere DataStage is also a preload option for providing extract, transform, and load (ETL) capabilities from an existing data warehouse to the BLU Acceleration warehouse. A separate purchase of the DB2 and InfoSphere software is required to meet license use requirements.

S822 CBU for IBM i

The Power S822 (8284-22A) CBU designation enables you to temporarily transfer IBM i processor license entitlements and IBM i user license entitlements purchased for a primary machine to a secondary CBU-designated system for HA/DR operations. Temporarily transferring these resources instead of purchasing them for your secondary system may result in significant savings. Processor activations cannot be transferred.

The CBU specify feature 0444 is available only as part of a new server purchase. Certain system prerequisites must be met and system registration and approval are required before the CBU specify feature can be applied on a new server. Standard IBM i terms and conditions do not allow either IBM i processor license entitlements or IBM i user license entitlements to be transferred permanently or temporarily. These entitlements remain with the machine they were ordered for. When you register the association between your primary and on-order CBU system, you must agree to certain terms and conditions regarding the temporary transfer.

After a new CBU system is registered along with the proposed primary system and the configuration is approved, you can temporarily move your optional IBM i processor license entitlement and IBM i user license entitlements from the primary system to the CBU system when the primary system is down or while the primary system processors are inactive. The CBU system can then support failover and role swapping for a full range of test, disaster recovery, and high availability scenarios. Temporary entitlement transfer means that the entitlement is a property transferred from the primary system to the CBU system and may remain in use on the CBU system as long as the registered primary and CBU system are in deployment for the high availability or disaster recovery operation. The intent of the CBU offering is to enable regular role-swap operations.

The primary systems for a Power S822 (8284-22A) server with its IBM i P10 software tier can be POWER7, or POWER7+ server with a P10 or P20 software tier listed below:

- 750 (8408 E8D)
- 750 (8233-E8B)
- 730 (8231-E2D)
- 740 (8205 E6B)
- 740 (8205 E6C)
- 740 (8205 E6D)
- S824 (8286 42A)
- 720 (8202-E4B) 8351, 8352
- 720 (8202 E4C) EPC6, EPC7
- 720 (8202 E4D) EPCL, EPCM
- 710 (8231-E1D) EPCG, EPCJ
- 710 (8268-E1D) EPCG, EPCJ
- S814 (8286-41A)
- S822 (8284-22A)
- P460 (7895-43X)
- P460 (7895-42X)
- P270 (7954-24X)
- P260 (7895-22X)
- P260 (7895-23X)
- PS704 (7891-74X)
- PS703 (7891-73X)
- PS701/702 (8406-71Y)

The primary machine must be in the same enterprise as the CBU system. The solution editions are not eligible for CBU status.

Before you can temporarily transfer IBM i processor license entitlements from the registered primary system, you must have more than one IBM i processor license on the primary machine and at least one IBM i processor license on the CBU server. An activated processor must be available on the CBU server to use the transferred entitlement. You can then transfer any IBM i processor entitlements above the minimum one, assuming the total IBM i workload on the primary system does not require the IBM i entitlement you would like to transfer during the time of the transfer. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor license entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. These warning messages in this situation do not mean you are not in compliance.

Before you can temporarily transfer IBM i user entitlements, you must have more than the minimum number of IBM i user entitlements on a primary server. You can then transfer any IBM i user entitlements above the minimum, assuming the total IBM i users on the primary system do not require the IBM i entitlement you want to transfer during the time of the transfer. The Power S824, Power 740, and 750 do not have user entitlements that can be transferred, and only processor license entitlements can be transferred. The minimum number of IBM i users on the POWER7 and POWER8 with IBM i user entitlements are:

- Power 720 4-core (8202-E4B, 8202-E4C, 8202-E4D): 5 users
- Power 720 6-core or 8-core (8202-E4B, 8202-E4C, 8202-E4D): 30 users
- Power S814 4-core (8286-41A): 5 users
- Power S814 6-core or 8-core (8286-41A): 10 users
- Power S822 (8284-22A): 10 users

For example, if you have a S814 6-core server as your primary system with two IBM i processor license entitlements (one above the minimum) and 40 IBM i user entitlements (30 above the minimum), you can temporarily transfer up to one IBM i entitlement and up to 30 user entitlements. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor and user license entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system.

If your primary or CBU machine is sold or discontinued from use, any temporary entitlement transfers must be returned to the machine on which they were originally acquired. For CBU registration and further information visit

http://www.ibm.com/systems/power/hardware/cbu

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Models

Model summary matrix

Model	Processor	Processor sockets	Maximum System Memory
22A	POWER8	Two	1024 GB

Note: IBM Power System Machine type/Model 8284-22A is being withdrawn in South Korea effective December 31, 2019.

Customer setup (CSU)

Yes, except processor (ELPD, ELP3) features.

Devices supported

No answer data found for External Machine Type (Support Devices) section.

Model conversions

Not available.

Feature conversions

The existing components being replaced during a model or feature conversion become the property of IBM and must be returned.

Feature conversions are always implemented on a "quantity of one for quantity of one" basis. Multiple existing features may not be converted to a single new feature. Single existing features may not be converted to multiple new features.

The following conversions are available to customers:

Feature conversions for 8284-22A virtualization engine features

```
                                                            RETURN
From FC:                      To FC:                        PARTS
---------------------------   ---------------------------   ------
5227 - PowerVM Standard       5228 - PowerVM Enterprise     No
Edition                       Edition
```

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Technical description

⇓ Physical specifications
⇓ Operating environment
⇓ Limitations

⇓ Hardware requirements
⇓ Software requirements

Physical specifications

- Width: 443 mm (17.5 in.)
- Depth: 755 mm (29.7 in.)
- Height: 87 mm (3.5 in.)
- Weight: 28.6 kg (63 lb)

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

- Temperature: (nonoperating) 5 to 45 degrees C (41 to 113 F); recommended temperature (operating) 18 to 27 degrees C (64 to 80 F); allowable operating temperature 5 to 35 degrees C (41 to 95 F)
- Relative humidity: Nonoperating 8% to 80%; recommended 5.5 degrees C (42 F) dew point to 60% RH and 15 degrees C (59 F) dew point
- Maximum dew point: 28 degrees C (84 F)(operating)
- Operating voltage: 1400W PSU: 200 to 240 V ac
- Operating frequency: 47/63 Hz
- Maximum measured power consumption: 1810 watts (maximum)
- Power factor: 0.98
- Thermal output: 6,176 Btu/hour (maximum)
- Power-source loading
    - 1.88 kVa (maximum configuration)
    - Maximum altitude: 3,050 m (10,000 ft)

Note: The maximum measured value is the worst case power consumption expected from a fully populated server under an intensive workload. The maximum measured value also accounts for component tolerance and non-ideal operating conditions. Power consumption and heat load vary greatly by server configuration and utilization. The IBM Systems Energy Estimator should be used to obtain a heat output estimate based on a specific configuration http://www-912.ibm.com/see/EnergyEstimator

Noise level and sound power

- Rack-mount system: 6.5 bels operating; 6.5 bels idling

See the Installation Planning Guide in the IBM Knowledge Center for addition detail.

For example, the actual sound power noise level is impacted by multiple factors including:

- Enablement of the Turbo mode increases fan speed which increases the noise levels
- Usage of the Turbo mode further increases fan speed which further increases the acoustical noise levels
- Feature Code EPXL increases system performance and fan speeds resulting in higher acoustical noise levels similar to Turbo mode
- Using higher wattage PCIe adapters such as features #5913, EJ0L, EL3B, and EL60 increases fan speed which increases the acoustical noise levels
- Placing multiple servers in a rack increases the total acoustical noise level coming from the rack
- Placing servers in racks with acoustic doors reduces the acoustical noise levels.

Installation and operation of systems with the #EPXL feature code will result in higher acoustical noise levels than an equivalent IBM Machine without feature code #EPXL due to fan speed increases. The acoustical noise levels will be similar to when an equivalent IBM machine without #EPXL is operated in Turbo mode. See the physical planning manual for more detail.

Local regulations may govern noise level exposure in the workplace and surrounding area, and may apply to client and client's Machine installation. The actual sound pressure levels in client's installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where client designates the racks to be installed; the noise levels from other equipment; the room ambient temperature; and employees' location in relation to the equipment. Further, compliance with such government regulations also depends upon a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. IBM recommends that client consult with qualified experts in this field to determine whether client's use of Machines with feature code #EPXL is in compliance with the applicable regulations

With the 4.1 GHz cards, good cooling in the machine room is recommended as heavy workloads might see some performance degradation above 30 degrees Celsius if internal temperatures trigger a CPU clock reduction. Fans also run faster with the 4.1 GHz cards, increasing the acoustical noise level.

Firmware level 8.1.3, or later, is required unless PowerVM is being used. If PowerVM is being used, then Firmware level 8.3, or later, is required.

EMC conformance classification

This equipment is subject to FCC rules and shall comply with the appropriate FCC rules before final delivery to the buyer or centers of distribution.

- US: FCC Class A
- Europe: CISPR 22 Class A
- Japan: VCCI-A
- Korea: Korean Requirement Class A
- China: People's Republic of China commodity inspection law Class A

Homologation -- Telecom environmental testing (Safety and EMC):

Homologation approval for specific countries has been initiated with the IBM Homologation and Type Approval (HT&A) organization in LaGaude, France. This Power Systems model and applicable features meet the environmental testing requirements of the country telecom and have been designed and tested in compliance with the Full Quality Assurance Approval (FQAA) process as delivered by the British Approval Board for Telecom (BABT), the UK Telecom regulatory authority.

This product is not certified for connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Product safety/Country testing/Certification

- UL 60950 Underwriters Laboratory, Safety Information
- CSA C22.2 No. 60950-00, Canadian Standards Association
- EN60950 European Norm
- IEC 60950, Edition 1, International Electrotechnical Commission, Safety Information
- Nordic deviations to IEC 60950-1 1st Edition

General requirements:

The product is in compliance with IBM Corporate Bulletin C-B 0-2594-000 Statement of Conformity of IBM Product to External Standard (Suppliers Declaration).

Systems

- Product category: D
- Power consumption in active mode: 291 watts
- Base processor configuration Composite Theoretical Performance (CTP): 255,509 MTOPs (6-core 3.026 GHz processor)
- WT:
  - 0.0586 6-core POWER8 3.891 GHz (8 processors)
  - 0.1172 6-core POWER8 3.891 GHz (12 processors)
  - 0.0833 10-core POWER8 3.425 GHz (10 processors)
  - 0.1666 10-core POWER8 3.425 GHz (20 processors)

WT is Weighted Teraflops, which is based on the number of floating point operations the processor can perform in a cycle.

Homologation

This product is not certified for direct connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Limitations

Clients who have acquired 8284-22A who desire to run IBM i need to be at firmware level 860.20 or later. (Firmware 860.20 provides 4 cores per partition for IBM i. Firmware 840.50 also provides support for IBM i however allows 2 cores per partition. Therefore firmware 860.20 or later is recommended.) In case upgrading to the required firmware level is not possible, contact Pcod@us.ibm.com to request a VET code to turn on IBM i.

System limitations

- Multiple IBM i partitions are supported, but a max of 2 or 4 cores (physical or virtual) per IBM i partition is supported. Two is the maximum unless firmware 8.60.10 or later is installed and then it is four.
- All IBM i I/O is through VIOS. No natively attached I/O is supported. Note, though most I/O is supported by VIOS, Async/Bisync PCIe adapters and Crypto cards are not. Also note that only 4k byte sector HDD/SSD are supported when located in an EXP24S or EXP24SX or in the S822 system unit.
- Integrated system ports are not supported under AIX or Linux when the HMC ports are connected to an HMC. Either the HMC ports or the integrated system ports can be used, but not both.
- Integrated system ports are not supported under AIX or Linux when the HMC ports are connected to an HMC. Either the HMC ports or the integrated system ports can be used, but not both.
- The integrated system ports are supported for modem and asynchronous terminal connections by AIX or Linux. Any other application using serial ports requires a serial port adapter to be installed in a PCI slot. The integrated system ports do not support HACMP configurations.
- When feature #EPXL is ordered, the PCIe adapters #EJ0M, #EJ11, #EC32, #EC37, and #EC2M are not available for the configuration. The Expansion Drawer #EMX0 is supported in a configuration with feature #EPXL, so the high profile adapters can be configured and will be supported in the Expansion Drawer #EMX0.

Note: If the 8-core 4.1 GHZ processor feature #EPXL is ordered, then the following PCIe adapters #EJ0M, #EJ11, #EC32, #EC37, and #EC2M cannot be configured in the CEC.

Hardware requirements

The Power S822 offers one or two processor module. The system can contain up to 1024 GB of system memory, storage backplane options of eight or twelve SFF-3 disk/SSD bays and six 1.8-inch SSD modules, four PCIe x 16 Gen 3 adapters (low profile slots), four PCIe x 8 Gen 3 adapters (low profile slots), and multiple media devices, as desired. This flexibility is made available through the many optional features for the Power S822.

One system central electronics complex (CEC) enclosure with the following items:

- Choose one or two processor modules from:
  - One 4-core 3.02 GHz POWER8 processor card (#EPXN)
  - One 8-core 4.157 Ghz POWER8 processor card (#EPXL)
  - One 6-core 3.89 GHz POWER8 Processor module (#EPX1)
  - One 10-core 3.42 GHz POWER8 Processor module (#EPXD)
    Note: If the 8-core 4.1 GHZ processor feature #EPXL is ordered, then the following PCIe adapters #EJ0M, #EJ11, #EC32, #EC37, and #EC2M cannot be configured in the CEC.
    Note: The total number of processor activation features must equal the total number of cores on the system.

- Choose 32 GB minimum memory from:
  - 16 GB CDIMM, 1600 Mbps, 4 Gb DDR4 DRAM (#EM96)
  - 32 GB CDIMM, 1600 Mbps, 4 Gb DDR4 DRAM (#EM97)
  - 64 GB CDIMM, 1600 Mbps, 4 Gb DDR4 DRAM (#EM98)
- Choose storage backplane from:
  - Twelve SFF-3 Bays/DVD Bay (#EJ0T).
  - Eight SFF-3 Bays/six 1.8-inch SSD bays/DVD Bay/Dual IOA with Write Cache (#EJ0U).
  - Split feature EJ0T to 6+6 SFF-3 Bays: Add a second SAS Controller (#EJ0V).
  - One PCIe2 4-port 1 GbE Adapter (#5260) is defaulted. Options for servers with AIX and Linux as the primary operating system are one of a 10GB Ethernet adapter either #EN0J, #EN0L, #EN0T, #EN0V or #EN0X.
    Note: The adapter takes up one PCIe slot.
- Choose HDDs and SSDs from any orderable SFF HDD or SSD. The default is the 146 GB 15K RPM SAS SFF-3 for AIX/Linux (#ESDT).
  Note: No internal HDD or SSD is required if feature 0837 (Boot from SAN) is selected. In this case, a Fibre Channel or Fibre Channel over Ethernet adapter must also be ordered.
- Choose the Primary Operating System Indicator from the following:
  - AIX (#2146)
  - Linux (#2147)
- One Language Group, Specify (#9300 or #97xx)
- Two power supplies: 1+1 1400 Watt 200-240 Volt or 180-400 Volt DC options
- Two PDU power cords (#6665, #6458, #6672, #6671, #6577, #6660, #6460, #6469, or 6669)
- Choose a cover set from:
  - IBM Rack-mount Drawer Bezel and Hardware (#EJT4, used with #EJ0T backplane)
  - IBM Rack-mount Drawer Bezel and Hardware (#EJT5, used with #EJ0U backplane)
  - OEM Rack-mount Drawer Bezel and Hardware (#EJT6, used with #EJ0T backplane)
  - OEM Rack-mount Drawer Bezel and Hardware (#EJT7, used with #EJ0U backplane)

Hardware Management Console (HMC) machine code

An HMC or IVM is required to manage the IBM Power System S822 (8284-22A) implementing partitioning. Multiple POWER6, POWER7, and POWER8 processor-based servers can be supported by a single HMC. If an HMC is used to manage the IBM Power System S822, the HMC must be a rack-mount model CR5, or later, or deskside model C08.

If you are attaching an HMC to a new server or adding function to an existing server that requires a firmware update, the HMC machine code may need to be updated because HMC code must always be equal to or higher than the managed server's firmware. Access to firmware and machine code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM at its discretion.

To determine the HMC machine code level required for the firmware level on any server, go to the following web page to access the Fix Level Recommendation Tool (FLRT) on or after the planned availability date for this product. FLRT will identify the correct HMC machine code for the selected system firmware level

https://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html
If a single HMC is attached to multiple servers, the HMC machine code level must be updated to be at or higher than the server with the most recent firmware level. All prior levels of server firmware are supported with the latest HMC machine code level.

The HMC code level 8.810 contains the following:

- Support for managing IBM Power System S822, S824, S814, S812L and S822L systems.
- Support for the new HMC model 7042-CR8.
- Support for PowerVM functions such as the new HMC GUI interface for VIOS management.
- GUI for HMC's Performance and Capacity Monitoring function.
- A HMC command to initiate a remote restart operation. This removes the requirement of VMControl for the PowerVM Remote Restart function.
- For PowerVM GUI functions, VIOS 2.2.3.3 is recommended.

Software requirements

The Power S822 supports the following:

- Red Hat Enterprise Linux 6.5, or later
- SUSE Linux Enterprise Server 11 Service Pack 3, or later
- AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
- AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
- AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 5 or later (planned availability August 29, 2014)
- AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 10 or later (planned availability August 29, 2014)
- AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 5 or later (planned availability August 29, 2014)
- AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 10 or later (planned availability August 29, 2014)
- These additional AIX levels are supported in an LPAR using virtualize I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
- VIOS 2.2.3.3 with interim fix IV56366, or later
- VIOS 2.2.2.5 (planned availability August 29, 2014)
- VIOS 2.2.1.9 (planned availability August 29, 2014)
- IBM i 7.1 TR11 or later supported via VIOS
- IBM i 7.2 TR3 or later supported via VIOS

Publications

IBM Power Systems hardware documentation provides clients with the following topical information:

- Licenses, notices, safety, and warranty information
- Planning for the system
- Installing and configuring the system
- Troubleshooting, service, and support
- Installing, configuring, and managing consoles, terminals, and interfaces
- Installing operating systems
- Creating a virtual computing environment
- Enclosures and expansion units
- Glossary

You can access the product documentation at

http://www.ibm.com/support/knowledgecenter/POWER8
Product documentation is also available on DVD (SK5T-7087).

The following information is shipped with the 8284-22A:

- Power Hardware Information DVD (SK5T-7087)
- Installing the 8284-22A
- Important Notices
- Warranty Information
- License Agreement for Machine Code

Hardware documentation such as installation instructions, user's information, and service information is available to download or view at

http://www.ibm.com/systems/support
You can access AIX documentation at

http://www.ibm.com/support/knowledgecenter/ssw_aix/we lcome
You can access documentation about Linux on IBM systems at

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http://www.ibm.com/support/knowledgecenter/linuxonibm/liaab/ic-
homepage.htm
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http://www.ibm.com/support/knowledgecenter/

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Features

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⇣ Features - Chargeable   ⇣ Feature descriptions

Features - No charge

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  - (#9700) -Language Group Specify - Dutch
  - (#9703) -Language Group Specify - French
  - (#9704) -Language Group Specify - German
  - (#9705) -Language Group Specify - Polish
  - (#9706) -Language Group Specify - Norwegian
  - (#9707) -Language Group Specify - Portuguese
  - (#9708) -Language Group Specify - Spanish
  - (#9711) -Language Group Specify - Italian
  - (#9712) -Language Group Specify - Canadian French
  - (#9714) -Language Group Specify - Japanese
  - (#9715) -Language Group Specify - Traditional Chinese (Taiwan)
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  - (#9721) -Language Group Specify - Russian
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  - (#9724) -Language Group Specify - Czech
  - (#9725) -Language Group Specify -- Romanian
  - (#9726) -Language Group Specify - Croatian
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- Specify Codes
  - (#9440) -New AIX License Core Counter
  - (#9442) -New Red Hat License Core Counter
  - (#9443) -New SUSE License Core Counter
  - (#9444) -Other AIX License Core Counter
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  - (#9447) -VIOS Core Counter
  - (#9449) -Other License Core Counter

Features - Chargeable

Special Features - Initial Orders

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  - (#EBC0) -Blockchain on Power
  - (#ECP0) -Cloud Private Solution
  - (#ESC0) -S&H - No Charge
  - (#ESC5) -S&H-a
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  - (#4256) -Extender Cable - USB Keyboards, 1.8M
  - (#ECCF) -System Port Converter Cable for UPS
  - (#ECCG) -Variable Length, Blue Cat5e Cable
  - (#ECCH) -Variable Length, Green Cat5e Cable
  - (#ECCJ) -Variable Length, Yellow Cat5e Cable
  - (#ECCK) -Variable Length FIBRE SAN CABLE
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- Miscellaneous
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  - (#EHJD) -PureApp Gen3 Consolidation Feature
  - (#EHJL) -P8 S822 Build Ahead / Specify
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  - (#ER2C) -Water Cooling of Processor Module
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  - (#ERB0) -Bulk Packaging Request ID
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  - (#ERB2) -Bulk Packaging ID #2
  - (#ERB3) -Bulk Packaging ID #3
  - (#ERB4) -Bulk Packaging ID #4
  - (#ERB5) -Bulk Packaging ID #5
  - (#ERB6) -Bulk Packaging ID #6
  - (#ERB7) -Bulk Packaging ID #7
  - (#ERB8) -Bulk Packaging ID #8
  - (#ERB9) -Bulk Packaging ID #9
  - (#ERBA) -Bulk Packaging ID #10
  - (#ERBB) -Bulk Packaging ID #11
  - (#ERBC) -Bulk Packaging ID #12
  - (#ERBD) -Bulk Packaging ID #13
  - (#ERBE) -Bulk Packaging ID #14
  - (#ERBF) -Bulk Packaging ID #15
  - (#ERBG) -Bulk Packaging ID #16
  - (#ERBH) -Bulk Packaging ID #17
  - (#ERBJ) -Bulk Packaging ID #18
  - (#ERBK) -Bulk Packaging ID #19
  - (#ERBL) -Bulk Packaging ID #20
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  - (#EPWA) -Small Linux Configuration - 2 10-core 3.42GHz Processors, 256 GB Memory, 146 GB HDD

- (#EPWA) -Small Linux Configuration --2 10-core 3.42GHz Processors, 256 GB Memory, 146 GB HDD
- (#EPWB) -Medium Linux Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 146 GB HDD
- (#EPWC) -Large Linux Configuration -- 2 10-core 3.42 GHz Processors, 1 TB Memory, 146 GB HDD
- (#EPWD) -Small AIX Configuration -- 2 10-core 3.42 GHz Processors, 256 GB Memory, 146 GB HDD
- (#EPWE) -Medium AIX Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 146 GB HDD
- (#EPWF) -Large AIX Configuration - 2 10--core 3.42 GHz Processors, 1 TB Memory, 146 GB HDD
- (#EPWG) -Small IBM i Configuration --2 10-core 3.42GHz Processors, 256 GB Memory, 146 GB HDD
- (#EPWH) -Medium IBM i Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 146 GB HDD
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- Services
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  - (#4649) -Rack Integration Services
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  - (#EC3T) -PCIe3 LP 1-port 100Gb EDR IB Adapter x16
  - (#EU19) -Cable Ties & Labels
- Adapters
  - (#5260) -PCIe2 LP 4-port 1GbE Adapter
  - (#5269) -PCIe LP POWER GXT145 Graphics Accelerator
  - (#5270) -PCIe LP 10Gb FCoE 2-port Adapter
  - (#5271) -PCIe LP 4-Port 10/100/1000 Base-TX Ethernet Adapter
  - (#5273) -PCIe LP 8Gb 2-Port Fibre Channel Adapter
  - (#5274) -PCIe LP 2-Port 1GbE SX Adapter
  - (#5275) -PCIe LP 10GbE SR 1-port Adapter
  - (#5276) -PCIe LP 4Gb 2-Port Fibre Channel Adapter
  - (#5277) -PCIe LP 4-Port Async EIA-232 Adapter
  - (#5278) -PCIe LP 2-x4-port SAS Adapter 3Gb
  - (#5280) -PCIe2 LP 4-Port 10GbE&1GbE SR&RJ45 Adapter
  - (#5281) -PCIe LP 2-Port 1GbE TX Adapter
  - (#5283) -PCIe2 LP 2-Port 4X IB QDR Adapter 40Gb
  - (#5284) -PCIe2 LP 2-port 10GbE SR Adapter
  - (#5290) -PCIe LP 2-Port Async EIA-232 Adapter
  - (#5285) -PCIe2 2-Port 4X IB QDR Adapter 40Gb
  - (#5287) -PCIe2 2-port 10GbE SR Adapter
  - (#5708) -10Gb FCoE PCIe Dual Port Adapter
  - (#5717) -4-Port 10/100/1000 Base-TX PCI Express Adapter
  - (#5729) -PCIe2 8Gb 4-port Fibre Channel Adapter
  - (#5735) -8 Gigabit PCI Express Dual Port Fibre Channel Adapter
  - (#5744) -PCIe2 4-Port 10GbE&1GbE SR&RJ45 Adapter
  - (#5767) -2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter
  - (#5768) -2-Port Gigabit Ethernet-SX PCI Express Adapter
  - (#5769) -10 Gigabit Ethernet-SR PCI Express Adapter
  - (#5774) -4 Gigabit PCI Express Dual Port Fibre Channel Adapter
  - (#5785) -4 Port Async EIA-232 PCIe Adapter
  - (#5805) -PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter
  - (#5899) -PCIe2 4-port 1GbE Adapter
  - (#5901) -PCIe Dual-x4 SAS Adapter
  - (#5913) -PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb
  - (#5923) -Non-paired PCIe SAS RAID Indicator
  - (#5924) -Non-paired Indicator 5913 PCIe SAS RAID Adapter
  - (#EC27) -PCIe2 LP 2-Port 10GbE RoCE SFP+ Adapter
  - (#EC28) -PCIe2 2-Port 10GbE RoCE SFP+ Adapter
  - (#EC29) -PCIe2 LP 2-Port 10GbE RoCE SR Adapter
  - (#EC2G) -PCIe2 LP 2-port 10GbE SFN6122F Adapter
  - (#EC2J) -PCIe2 2-port 10GbE SFN6122F Adapter
  - (#EC2M) -PCIe3 LP 2-port 10GbE NIC&RoCE SR Adapter
  - (#EC2N) -PCIe3 2-port 10GbE NIC&RoCE SR Adapter
  - (#EC30) -PCIe2 2-Port 10GbE RoCE SR Adapter
  - (#EC32) -PCIe3 LP 2-port 56Gb FDR IB Adapter x16
  - (#EC37) -PCIe3 LP 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
  - (#EC38) -PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
  - (#EC3B) -PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter
  - (#EC3A) -PCIe3 LP 2-Port 40GbE NIC RoCE QSFP+ Adapter
  - (#EC3L) -PCIe3 LP 2-port 100GbE (NIC& RoCE) QSFP28 Adapter x16
  - (#EC41) -PCIe2 LP 3D Graphics Adapter x1
  - (#EC45) -PCIe2 LP 4-Port USB 3.0 Adapter
  - (#EC46) -PCIe2 4-Port USB 3.0 Adapter
  - (#EC51) -PCIe3 LP 3D Graphics Adapter x16
  - (#EC54) -PCIe3 LP 1.6TB NVMe Flash Adapter
  - (#EC56) -PCIe3 LP 3.2TB NVMe Flash Adapter
  - (#EJ05) -PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer
  - (#EJ0J) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8
  - (#EJ0L) -PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
  - (#EJ0M) - PCIe3 LP RAID SAS ADAPTER Quad-Port 6Gb x8
  - (#EJ10) -PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
  - (#EJ11) -PCIe3 LP SAS Tape/DVD Adapter Quad-port 6Gb x8
  - (#EJ13) -PCIe3 LP FPGA Accelerator Adapter
  - (#EJ14) -PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
  - (#EJ18) -PCIe3 LP CAPI FlashSystem Accelerator Adapter
  - (#EJ1N) -PCIe1 LP SAS Tape/DVD Dual-port 3Gb x8 Adapter
  - (#EJ1P) -PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter
  - (#EJ28) -PCIe Crypto Coprocessor Gen3 BSC 4765-001

- (#EJ28) -PCIe Crypto Coprocessor Gen3 BSC 4765-001

- (#EJ33) -PCIe3 Crypto Coprocessor BSC-Gen3 4767
- (#EN0B) -PCIe3 LP 16Gb 2-port Fibre Channel Adapter
- (#EN0F) -PCIe2 LP 8Gb 2-Port Fibre Channel Adapter
- (#EN0G) -PCIe2 8Gb 2-Port Fibre Channel Adapter
- (#EN0J) -PCIe3 LP 4-port (10Gb FCoE & 1GbE) SR&RJ45
- (#EN0L) -PCIe3 LP 4-port(10Gb FCoE & 1GbE) SFP+Copper&RJ45
- (#EN0N) -PCIe3 LP 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter
- (#EN0T) -PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter
- (#EN0V) -PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
- (#EN0X) -PCIe2 LP 2-port 10/1GbE BaseT RJ45 Adapter
- (#EN0Y) -PCIe2 LP 8Gb 4-port Fibre Channel Adapter
- (#EN0A) -PCIe3 16Gb 2-port Fibre Channel Adapter
- (#EN0H) -PCIe3 4-port (10Gb FCoE & 1GbE) SR&RJ45
- (#EN0K) -PCIe3 4-port (10Gb FCoE & 1GbE) SFP+Copper&RJ45
- (#EN0M) -PCIe3 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter
- (#EN0S) -PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter
- (#EN0U) -PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
- (#EN0W) -PCIe2 2-port 10/1GbE BaseT RJ45 Adapter
- (#EN12) -PCIe2 8Gb 4-port Fibre Channel Adapter
- (#EN15) -PCIe3 4-port 10GbE SR Adapter
- (#EN17) -PCIe3 4-port 10GbE SFP+ Copper Adapter
- (#EN27) -2 Port Async EIA-232 PCIe Adapter
- (#EN28) -PCIe LP 2-Port Async EIA-232 Adapter
- (#ESA3) -PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb CR
- Administrative
  - (#0719) -Load Source Not in CEC
  - (#B0LG) -ServicePac Not Selected
  - (#B0LH) -Service Renewal Requested
  - (#B0UQ) -SP WSU 3Y 24x7 SD
  - (#B0VC) -ServicePac for Basic Selection for Power 3 years
  - (#B0VH) -SP HDR/MR POWER 3Y
  - (#EHS2) -SSD Placement Indicator - #ESLS/#ELLS
- Cable
  - (#0348) -V.24/EIA232 6.1m (20-Ft) PCI Cable
  - (#0353) -V.35 6.1m (20-Ft) PCI Cable
  - (#0359) -X.21 6.1m (20-Ft) PCI Cable
  - (#1025) -Modem Cable - US/Canada and General Use
  - (#2456) -2M LC-SC 50 Micron Fiber Converter Cable
  - (#2459) -2M LC-SC 62.5 Micron Fiber Converter Cable
  - (#2934) -3M Asynchronous Terminal/Printer Cable EIA-232
  - (#2936) -Asynchronous Cable EIA-232/V.24 3M
  - (#3124) -Serial-to-Serial Port Cable for Drawer/Drawer-3.7M
  - (#3125) -Serial-to-Serial Port Cable for Rack/Rack-8M
  - (#3287) -1m, (3.3-ft) IB 40G Copper Cable QSFP/QSFP
  - (#3288) -3m, (9.8-ft.) IB 40G Copper Cable QSFP/QSFP
  - (#3289) -5m QDR IB/E'Net Copper Cable QSFP/QSFP
  - (#3290) -10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/ QSFP
  - (#3293) -30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/ QSFP
  - (#3450) -SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure
  - (#3451) -SAS YO Cable 3m - HD 6Gb Adapter to Enclosure
  - (#3452) -SAS YO Cable 6m - HD 6Gb Adapter to Enclosure
  - (#3453) -SAS YO Cable 10m - HD 6Gb Adapter to Enclosure
  - (#3454) -SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure
  - (#3455) -SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure
  - (#3456) -SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure
  - (#3457) -SAS YO Cable 15m - HD 3Gb Adapter to Enclosure
  - (#3458) -SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure
  - (#3661) -SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/ Dual Path 3M:
  - (#3662) -SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/ Dual Path 6M:
  - (#3663) -SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/ Dual Path 15M:
  - (#3681) -3M SAS CABLE, ADPTR TO ADPTR (AA)
  - (#3684) -SAS Cable (AE) Adapter to Enclosure, single controller/ single path 3M
  - (#3685) -SAS Cable (AE) Adapter to Enclosure, single controller/ single path 6M
  - (#3691) -SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M
  - (#3692) -SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M
  - (#3693) -SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M
  - (#3694) -SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M
  - (#3925) -0.3M Serial Port Converter Cable, 9-Pin to 25-Pin
  - (#3927) -Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M
  - (#3928) -Serial Port Null Modem Cable, 9-pin to 9-pin, 10M

- (#3928) -Serial Port Null Modem Cable, 9-pin to 9-pin, 10M

- (#3930) -System Serial Port Converter Cable
- (#4242) -1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)
- (#4276) -VGA to DVI Connection Converter
- (#5915) -SAS AA Cable 3m - HD 6Gb Adapter to Adapter
- (#5916) -SAS AA Cable 6m - HD 6Gb Adapter to Adapter
- (#5917) -SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter
- (#5918) -SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter
- (#7802) -Ethernet Cable, 15m, Hardware Management Console to System Unit
- (#EB27) -QSFP+ 40GBase-SR Transceiver
- (#EB2B) -1m (3.3-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
- (#EB2H) -3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
- (#EB2J) -10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable
- (#EB2K) -30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable
- (#EB40) -0.5M FDR IB / 40GbE Copper Cable QSFP
- (#EB41) -1M FDR IB / 40GbE Copper Cable QSFP
- (#EB42) -2M FDR IB / 40GbE Copper Cable QSFP
- (#EB4A) -3M FDR IB / 40GbE Optical Cable SFP
- (#EB4B) -5M FDR IB / 40GbE Optical Cable QSFP
- (#EB4C) -10M FDR IB / 40GbE Optical Cable QSFP
- (#EB4D) -15M FDR IB / 40GbE Optical Cable QSFP
- (#EB4E) -20M FDR IB / 40GbE Optical Cable QSFP
- (#EB4F) -30M FDR IB / 40GbE Optical Cable QSFP
- (#EB4G) -50M FDR IB / 40GbE Optical Cable QSFP
- (#EB50) - 0.5M EDR IB Copper Cable QSFP28
- (#EB51) - 1.0M EDR IB Copper Cable QSFP28
- (#EB52) - 2.0M EDR IB Copper Cable QSFP28
- (#EB54) - 1.5M EDR IB Copper Cable QSFP28
- (#EB59) -100Gb Optical Transceiver QSFP28
- (#EB5A) - 3M EDR IB Optical Cable QSFP28
- (#EB5B) - 5M EDR IB Optical Cable QSFP28
- (#EB5C) - 10M EDR IB Optical Cable QSFP28
- (#EB5D) - 15M EDR IB Optical Cable QSFP28
- (#EB5E) - 20M EDR IB Optical Cable QSFP28
- (#EB5F) - 30M EDR IB Optical Cable QSFP28
- (#EB5G) - 50M EDR IB Optical Cable QSFP28
- (#EB5H) - 100M EDR IB Optical Cable QSFP28
- (#EB5J) -0.5M 100GbE Copper Cable QSFP28
- (#EB5K) -1.0M 100GbE Copper Cable QSFP28
- (#EB5L) -1.5M 100GbE Copper Cable QSFP28
- (#EB5M) -2.0M 100GbE Copper Cable QSFP28
- (#EB5N) -25M EDR IB Optical Cable QSFP28
- (#EB5R) -3M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5S) -5M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5T) -10M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5U) -15M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5V) -20M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5W) -30M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5X) -50M 100GbE Optical Cable QSFP28 (AOC)
- (#EB5Y) -100M 100GbE Optical Cable QSFP28 (AOC)
- (#ECBJ) -SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure
- (#ECBK) -SAS X Cable 6m - HD Narrow 6Gb 2-Adapters to Enclosure
- (#ECBL) -SAS X Cable 10m - HD Narrow 6Gb 2-Adapters to Enclosure
- (#ECBM) -SAS X Cable 15m - HD Narrow 3Gb 2-Adapters to Enclosure
- (#ECBN) -5m (16.4-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
- (#ECBT) -SAS YO Cable 1.5m - HD Narrow 6Gb Adapter to Enclosure
- (#ECBU) -SAS YO Cable 3m - HD Narrow 6Gb Adapter to Enclosure
- (#ECBV) -SAS YO Cable 6m - HD Narrow 6Gb Adapter to Enclosure
- (#ECBW) -SAS YO Cable 10m - HD Narrow 6Gb Adapter to Enclosure
- (#ECBX) -SAS YO Cable 15m - HD Narrow 3Gb Adapter to Enclosure
- (#ECBY) -SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure
- (#ECBZ) -SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure
- (#ECC0) -SAS AA Cable 0.6m - HD Narrow 6Gb Adapter to Adapter
- (#ECC2) -SAS AA Cable 1.5m - HD Narrow 6Gb Adapter to Adapter
- (#ECC3) -SAS AA Cable 3m - HD Narrow 6Gb Adapter to Adapter
- (#ECC4) -SAS AA Cable 6m - HD Narrow 6Gb Adapter to Adapter
- (#ECC7) -3M Optical Cable Pair for PCIe3 Expansion Drawer
- (#ECC8) -10M Optical Cable Pair for PCIe3 Expansion Drawer
- (#ECCS) -3M Copper CXP Cable Pair for PCIe3 Expansion Drawer
- (#ECDJ) -3.0M SAS X12 Cable (Two Adapter to Enclosure)

- (#ECDK) -4.5M SAS X12 Active Optical Cable (Two Adapter to Enclosure)

- (#ECDL) -10M SAS X12 Active Optical Cable (Two Adapter to Enclosure)
- (#ECDT) -1.5M SAS YO12 Cable (Adapter to Enclosure)
- (#ECDU) -3.0M SAS YO12 Cable (Adapter to Enclosure)
- (#ECDV) -4.5M SAS YO12 Active Optical Cable (Adapter to Enclosure)
- (#ECDW) -10M SAS YO12 Active Optical Cable (Adapter to Enclosure)
- (#ECE0) -0.6M SAS AA12 Cable (Adapter to Adapter)
- (#ECE3) -3.0M SAS AA12 Cable
- (#ECE4) -4.5M SAS AA12 Active Optical Cable (Adapter to Adapter)
- (#ECW0) -Optical Wrap Plug
- (#EN01) -1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper
- (#EN02) -3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper
- (#EN03) -5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper
- (#EQ02) -Quanity 150 of #3452 SAS YO Cable 6m - HD 6Gb Adapter to Enclosure
- (#EQ03) -Quantity 150 of #3453 SAS YO Cable 10m - HD 6Gb Adapter to Enclosure
- Disk
  - (#1752) -900GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#1818) -Quantity 150 of #1964
  - (#1866) -Quantity 150 of #1917
  - (#1869) -Quantity 150 of #1925
  - (#1917) -146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#1925) -300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#1929) -Quantity 150 of #1953
  - (#1953) -300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#1964) -600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#EQ52) -Quantity 150 of #1752 (900GB SFF-2 disk)
  - (#EQ62) -Quantity 150 of #ES62 3.86-4.0 TB 7200 rpm 4k LFF-1 Disk
  - (#EQ64) -Quantity 150 of #ES64 7.72-8.0 TB 7200 rpm 4k LFF-1 Disk
  - (#EQD3) -Quantity 150 of #ESD3 (1.2TB 10k SFF-2)
  - (#EQDP) -Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/ LINUX)
  - (#EQEZ) -Quantity 150 of #ESEZ (300GB SFF-2)
  - (#EQF3) -Quantity 150 of #ESF3 (1.2TB 10k SFF-2)
  - (#EQFP) -Quantity 150 of #ESFP (600GB SFF-2)
  - (#EQFT) -Quantity 150 of #ESFT (1.8TB 10k SFF-2)
  - (#EQEV) -Quantity 150 of #ESEV (600GB 10k SFF-2)
  - (#ES62) -3.86-4.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)
  - (#ES64) -7.72-8.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)
  - (#ESD3) -1.2TB 10K RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#ESD5) -600GB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESD9) -1.2TB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESDB) -300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESDF) -600GB 15k RPM SAS SFF-3 Disk Drive - 5xx Block
  - (#ESDP) -600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block
  - (#ESDR) -300GB 10k RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESDT) -146GB 15k RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESEV) -600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
  - (#ESEZ) -300GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive
  - (#ESF3) -1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
  - (#ESF5) -600GB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
  - (#ESF9) -1.2TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
  - (#ESFB) -300GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive
  - (#ESFF) -600GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive
  - (#ESFP) -600GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive
  - (#ESFT) -1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
  - (#ESFV) -1.8TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
  - (#ESNK) -300GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/ Linux)
  - (#ESNM) -300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
  - (#ESNP) -600GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/ Linux)
  - (#ESNR) -600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
  - (#ESPM) -Quantity 150 of #ESNM (300GB 15k SFF-2)
  - (#ESPR) -Quantity 150 of #ESNR (600GB 15k SFF-2)
- Display
  - (#3632) -Widescreen LCD Monitor
- Drive
  - (#1107) -USB 500 GB Removable Disk Drive
  - (#EU01) -1TB Removable Disk Drive Cartridge
  - (#EU04) -RDX USB External Docking Station for Removable Disk Cartridge
  - (#EU08) -RDX 320 GB Removable Disk Drive
  - (#EU15) -1.5TB Removable Disk Drive Cartridge
  - (#EU2T) -2TB Removable Disk Drive Cartridge (RDX)
- Keyboards

- (#EK51) -Full Width Keyboard -- USB, US English, #103P

- (#EK52) -Full Width Keyboard -- USB, French, #189

- (#EK53) -Full Width Keyboard -- USB, Italian, #142
- (#EK58) -Full Width Keyboard -- USB, Brazilian Portuguese, #275
- (#EK59) -Full Width Keyboard -- USB, Hungarian, #208
- (#EK60) -Full Width Keyboard -- USB, Korean, #413
- (#EK61) -Full Width Keyboard -- USB, Chinese, #467
- (#EK62) -Full Width Keyboard to USB, French Canadian, #445
- (#EK64) -Full Width Keyboard -- USB, Belgian/UK, #120
- (#EK65) -Full Width Keyboard -- USB, Swedish/Finnish, #153
- (#EK66) -Full Width Keyboard -- USB, Danish, #159
- (#EK67) -Full Width Keyboard -- USB, Bulgarian, #442
- (#EK68) -Full Width Keyboard -- USB, Swiss/French/German, #150
- (#EK69) -Full Width Keyboard -- USB, Norwegian,#155
- (#EK70) -Full Width Keyboard -- USB, Dutch, #143
- (#EK71) -Full Width Keyboard -- USB, Portuguese, #163
- (#EK72) -Full Width Keyboard -- USB, Greek, #319
- (#EK73) -Full Width Keyboard -- USB, Hebrew, #212
- (#EK74) -Full Width Keyboard -- USB, Polish, #214
- (#EK75) -Full Width Keyboard -- USB, Slovakian, #245
- (#EK76) -Full Width Keyboard -- USB, Czech, #243
- (#EK77) -Full Width Keyboard -- USB, Turkish, #179
- (#EK78) -Full Width Keyboard -- USB, LA Spanish, #171
- (#EK79) -Full Width Keyboard -- USB, Arabic, #253
- (#EK80) -Full Width Keyboard -- USB, Thai, #191
- (#EK81) -Full Width Keyboard -- USB, Russian, #443
- (#EK82) -Full Width Keyboard -- USB, Slovenian, #234
- (#EK83) -Full Width Keyboard -- USB, US English Euro, #103P
- Linecords
  - (#6458) - Pwr Crd 4.3m 14ft to IBM PDU
  - (#6460) -Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)
  - (#6469) -Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/ 15A) U. S.
  - (#6470) -Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)
  - (#6471) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)
  - (#6472) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/ 16A)
  - (#6473) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/ 10A)
  - (#6474) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 13A)
  - (#6475) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 16A)
  - (#6476) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 10A)
  - (#6477) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 16A)
  - (#6478) -Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)
  - (#6488) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (125V/ 15A or 250V/10A)
  - (#6489) -4.3m (14-Ft) 3PH/32A 380-415V Power Cord
  - (#6491) -4.3m (14-Ft) 1PH/63A 200-240V Power Cord
  - (#6492) -4.3m (14-Ft) 1PH/48A 200-240V Power Cord
  - (#6493) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 10A)
  - (#6494) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 10A)
  - (#6496) -Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
  - (#6577) -Power Cable - Drawer to IBM PDU, 200-240V/10A
  - (#6651) -Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)
  - (#6653) -4.3m (14-Ft) 3PH/16A 380-415V Power Cord
  - (#6654) -4.3m (14-Ft) 1PH/24A Power Cord
  - (#6655) -4.3m (14-Ft) 1PH/24A WR Power Cord
  - (#6656) -4.3m (14-Ft)1PH/32A Power Cord
  - (#6657) -4.3m (14-Ft) 1PH/32A Power Cord
  - (#6658) -4.3m (14-Ft) 1PH/24A Power Cord-Korea
  - (#6659) -Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)
  - (#6660) -Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/ 15A)
  - (#6665) -Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)
  - (#6667) -4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia
  - (#6669) -Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)
  - (#6671) -Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A
  - (#6672) -Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A
  - (#6680) -Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/ 10A)
  - (#ECJ5) - 4.3m (14-Ft) PDU to Wall 3PH/24A 200-240V Delta-wired Power Cord
  - (#ECJ7) - 4.3m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power Cord
  - (#ELC0) -PDU Access Cord 0.38m
  - (#ELC5) -Power Cable - Drawer to IBM PDU (250V/10A)
  - (#EPAD) -2.5 Meter HVDC Power Cord
- Manufacturing Instruction
  - (#9359) -specify mode-1 & (1)5901/5278 for EXP24S #5887/EL1S
  - (#9360) -Specify mode-1 & (2)5901/5278 for EXP24S #5887/EL1S

- (#9361) -Specify mode-2 & (2)5901/5278 for EXP24S #5887/EL1S

- (#9365) -Specify mode-4 & (4)5901/5278 for EXP24S #5887/EL1S
- (#9366) -Specify mode-2 & (4)5901/5278 for EXP24S #5887/EL1S
- (#9367) -Specify mode-1 & (2)5903/5805 for EXP24S #5887/EL1S
- (#9368) -Specify mode-2 & (4)5903/5805 for EXP24S #5887/EL1S
- (#9385) -Specify mode-1 & (2) 5913 for EXP24S #5887/EL1S
- (#9386) -Specify mode-2 & (4) 5913 for EXP24S #5887/EL1S
- (#9387) -Specify mode-1 & CEC SAS port for EXP24 #5887/EL1S
- (#EJPJ) -Specify mode-2 (1)5901/5278 for EXP24 #5887 or #EL1S
- (#EJPK) -Specify mode-2 (2)5901/5278 for EXP24 #5887 or #EL1S
- (#EJPL) -Specify mode-4 (1)5901/5278 for EXP24 #5887 or #EL1S
- (#EJPM) -Specify mode-4 (2)5901/5278 for EXP24 #5887 or #EL1S
- (#EJPN) -Specify mode-4 (3)5901/5278 for EXP24 #5887 or #EL1S
- (#EJPR) -Specify mode-2 (2)5903/5805 for EXP24 #5887 or #EL1S
- (#EJPT) -Specify mode-2 (2)5913 for EXP24 #5887 or #EL1S
- (#EJR1) -Specify Mode-1 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJR2) -Specify Mode-1 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJR3) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) X for EXP24S (#5887/EL1S)
- (#EJR4) -Specify Mode-2 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJR5) -Specify Mode-4 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJR6) Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)
- (#EJR7) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)
- (#EJRA) Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (1) YO for EXP24S (#5887/El1S)
- (#EJRB) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (1) X for EXP24S (#5887/EL1S)
- (#EJRC) -Specify Mode-4 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJRD) -Specify Mode-4 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
- (#EJRE) -Specify Mode-4 & (3)EJ0J/EJ0M/EL3B for EXP24S (#5888/EL1S)
- (#EJRF) -Specify Mode-1 & (2)EJ14 for EXP24S (#5887/EL1S)
- (#EJRG) Specify Mode-2 & (2)EJ14 & (2) X for EXP24S (#5887/EL1S)
- (#EJRH) Specify Mode-2 & (2)EJ14 & (1) X for EXP24S (#5887/EL1S)
- (#EJRJ) -Specify Mode-2 & (4)EJ14 for EXP24S (#5887/EL1S)
- (#EJRL) -Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter
- (#EJRP) -Specify Mode-1 & (2)EJ0L for EXP24S (#5887/EL1S)
- (#EJRR) -Specify mode-2 & (4) EJ0L for EXP24S #5887/EL1S
- (#EJRS) Specify Mode-2 & (2)EJ0L & (2) X for EXP24S (#5887/EL1S)
- (#EJRT) Specify Mode-2 & (2)EJ0L & (1) X for EXP24S (#5887/EL1S)
- (#EJRU) -Non-paired Indicator EJ0L PCIe SAS RAID Adapter
- (#EJS1) -Non-paired Indicator ESA3 PCIe SAS RAID Adapter
- (#EJS2) -Specify Mode-2 & (2)ESA3 for EXP24S (#5887/#EL1S)
- (#EJS3) -Specify Mode-1 & (2)ESA3 for EXP24S (#5887/#EL1S)
- (#EJS4) -Specify Mode-2 & (4)ESA3 for EXP24S (#5887/#EL1S)
- (#EJV0) -Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP12SX #ESLL/ELLL
- (#EJV1) -Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL
- (#EJV2) -Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL
- (#EJV3) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJV4) -Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJV5) -Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJV6) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL
- (#EJV7) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL
- (#EJVA) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL
- (#EJVB) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL
- (#EJVC) -Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL
- (#EJVD) -Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL
- (#EJVE) -Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJVF) -Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ ELLL
- (#EJVG) -Specify Mode-2 & (2)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJVH) -Specify Mode-2 & (2)EJ14 & (1)X12 for EXP12SX #ESLL/ELLL
- (#EJVJ) -Specify Mode-2 & (4)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJVP) -Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ ELLL
- (#EJVR) -Specify Mode-2 & (4)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJVS) -Specify Mode-2 & (2)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL
- (#EJVT) -Specify Mode-2 & (2)EJ0L& (1)X12 for EXP12SX #ESLL/ELLL
- (#EJW0) -Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP24SX #ESLS/ELS
- (#EJW1) -Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS
- (#EJW2) -Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW3) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW4) -Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW5) -Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW6) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW7) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

- (#EJWA) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

- (#EJWA) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

- (#EJWB) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

- (#EJWC) -Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWD) -Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWE) -Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWF) -Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ ELLS
- (#EJWG) -Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWH) -Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWJ) -Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWP) -Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP24SX #ESLS/ ELLS
- (#EJWR) -Specify Mode-2 & (4)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWS) -Specify Mode-2 & (2)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWT) -Specify Mode-2 & (2)EJ0L& (1)X12 for EXP24SX #ESLS/ELLS
- Media Devices
  - (#5771) -SATA Slimline DVD-RAM Drive
  - (#EJ0T) -Storage Backplane 12 SFF-3 Bays/DVD Bay
  - (#EJ0U) -Storage Backplane 8 SFF-3 Bays/six 1.8-inch SSD bay/DVD Bay/Dual IOA with Write Cache
  - (#EJ0V) -Split #EJ0T to 6+6 SFF-3 Bays: Add 2nd SAS Controller
- Memory
  - (#4793) -Power Active Memory Expansion Enablement
  - (#EM83) -16GB CDIMM, 1600MHZ, 4GBIT DDR3 DRAM, Short
  - (#EM84) -32 GB DDR3 Memory
  - (#EM85) -64 GB DDR3 Memory
  - (#EM8P) -16 GB DDR4 Memory
  - (#EM8Q) -32 GB DDR4 Memory
  - (#EM8R) -64 GB DDR4 Memory
  - (#EM96) -16 GB DDR4 Memory
  - (#EM97) -32 GB DDR4 Memory
  - (#EM98) -64 GB DDR4 Memory
- Miscellaneous
  - (#1140) -Custom Service Specify, Rochester Minn, USA
  - (#2146) -Primary OS - AIX
  - (#2147) -Primary OS - Linux
  - (#2148) -IBM i with VIOS Only System Indicator
  - (#6586) -Modem Tray for 19-Inch Rack
  - (#ECSC) -Custom Service Specify, Shenzhen, China
  - (#ECSF) -Custom Service Specify, Montpellier, France
  - (#ECSM) -Custom Service Specify, Mexico
  - (#ECSP) -Custom Service Specify, Poughkeepsie, USA
- Packaging
  - (#EJTL) -Six-bay 1.8-inch SSD Cage
- Pointing Device
  - (#8845) -USB Mouse
- Power
  - (#7109) -Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
  - (#7188) -Power Distribution Unit
  - (#7196) -Power Distribution Unit (US) - 1 EIA Unit, Universal, Fixed Power Cord
  - (#EB2M) -AC Power Supply - 1400W for System Unit (200-240 VAC)
  - (#EB2N) -DC Power Supply - 1400W (180-400V)
  - (#ECJJ) - High Function 9xC19 Single-Phase or Three-Phase Wye PDU plus
  - (#ECJL) - High Function 9xC19 PDU plus 3-Phase Delta
  - (#ECJN) - High Function 12xC13 Single-Phase or Three-Phase Wye PDU plus
  - (#ECJQ) - High Function 12xC13 PDU plus 3-Phase Delta
  - (#EMXA) -AC Power Supply Conduit for PCIe3 Expansion Drawer
  - (#EMXB) -DC Power Supply Conduit for PCIe3 Expansion Drawer
  - (#EPAA) -HVDC PDU - 90A 6xOutlet
- Processor
  - (#EPNA) -570 Processor Days Activation for #EPWA/ESYA
  - (#EPNB) -570 Processor Days Activation for #EPWB/ESYB
  - (#EPNC) -570 Processor Days Activation for #EPWC/ESYC
  - (#EPND) -570 Processor Days Activation for #EPWD/ESYD
  - (#EPNE) -570 Processor Days Activation for #EPWE/ESYE
  - (#EPNF) -570 Processor Days Activation for #EPWF/ESYF
  - (#EPNG) -570 Processor Days Activation for #EPWG/ESYG
  - (#EPNH) -570 Processor Days Activation for #EPWH/ESYH
  - (#EPNJ) -570 Processor Days Activation for #EPWJ/ESYJ
  - (#EPTJ) -High Function 9xC19 PDU: Switched, Monitoring
  - (#EPTL) -High Function 9xC19 PDU 3-Phase: Switched, Monitoring
  - (#EPTN) -High Function 12xC13 PDU: Switched, Monitoring
  - (#EPTQ) -High Function 12xC13 PDU 3-Phase: Switched, Monitoring
  - (#EPX1) -6-core 3.89 GHz POWER8 Processor Card
  - (#EPXD) -10-core 3.42 GHz POWER8 Processor Card
  - (#EPXL) -8-core 4.1 GHz POWER8 Processor Card

- (#EPXN) -4-Core 3.02 GHz POWER8 Processor Card

- (#EPXN) -4-Core 3.02 GHz POWER8 Processor Card

- (#EPY1) -One Processor Core Activation for #EPX1

- (#EPYD) -One Processor Core Activation for #EPXD
- (#EPYL) -One Processor Core Activation for #EPXL
- (#EPYN) -One Processor Core Activation for #EPXN
- (#ESLA) -Specify AC Power Supply for EXP12SX/EXP24SX Storage Enclosure
- Rack Related
  - (#0551) -19 inch, 1.8 meter high rack
  - (#0553) -19 inch, 2.0 meter high rack
  - (#0599) -Rack Filler Panel Kit
  - (#5887) -EXP24S SFF Gen2-bay Drawer
  - (#6068) -Opt Front Door for 1.8m Rack
  - (#6069) -Opt Front Door for 2.0m Rack
  - (#6248) -1.8m Rack Acoustic Doors
  - (#6249) -2.0m Rack Acoustic Doors
  - (#6263) -1.8m Rack Trim Kit
  - (#6272) -2.0m Rack Trim Kit
  - (#6580) -Optional Rack Security Kit
  - (#7118) -Environmental Monitoring Probe
  - (#EB3Z) -Lift tool based on GenieLift GL-8 (standard)
  - (#EB4Z) -Service wedge shelf tool kit for EB3Z
  - (#EBA5) -HVDC PDU Horizontal Mounting
  - (#EC01) -Rack Front Door (Black)
  - (#EC02) -Rack Rear Door
  - (#EC03) -Rack Side Cover
  - (#EC04) -Rack Suite Attachment Kit
  - (#EC07) -Slim Rear Acoustic Door
  - (#EC08) -Slim Front Acoustic Door
  - (#EC15) -Rear Door Heat Exchanger for 2.0 Meter Slim Rack
  - (#ECR0) -2.0 Meter Slim Rack
  - (#ECRF) -Rack Front Door High-End appearance
  - (#ECRG) -Rack Rear Door Black
  - (#ECRJ) -Rack Side Cover
  - (#ECRK) -Rack Rear Extension 5-In
  - (#ECRM) -Rack Front Door for Rack (Black/Flat)
  - (#EJT4) -Front Bezel for 12-Bay BackPlane
  - (#EJT5) -Front Bezel for 8-Bay BackPlane
  - (#EJT6) -Front OEM Bezel for 12-Bay BackPlane
  - (#EJT7) -Front OEM Bezel for 8-Bay BackPlane
  - (#EMX0) -PCIe Gen3 I/O Expansion Drawer
  - (#EMXF) -PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
  - (#EMXG) -PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
  - (#EPTH) -Horizontal PDU Mounting Hardware
  - (#ER05) -42U Slim Rack
  - (#ERG0) -Rear rack extension
  - (#ESLL) -EXP12SX SAS Storage Enclosure
  - (#ESLS) -EXP24SX SAS Storage Enclosure
- Services
  - (#0010) -One CSC Billing Unit
  - (#0011) -Ten CSC Billing Units
  - (#EUC6) -Core Use HW Feature
  - (#EUC7) -Core Use HW Feature 10X
- Solid State Drive
  - (#EQ0C) -Quantity of 150 #ES0C
  - (#EQ0G) -Quantity 150 of #ES0G (775GB SSD SFF-2)
  - (#EQ0Q) -Quantity 150 of #ES0Q 387GB SFF-2 4k SSD (AIX/Linux)
  - (#EQ0S) -Quantity 150 of #ES0S 775GB SFF-2 4k SSD (AIX/Linux)
  - (#EQ19) -Quantity 150 of #ES19 (387GB SSD SFF-2)
  - (#EQ78) -Quantity 150 of #ES78 387GB SFF-2 SSD 5xx
  - (#EQ7E) -Quantity 150 of #ES7E 775GB SFF-2 SSD 5xx
  - (#EQ80) -Quantity 150 of #ES80 1.9TB SFF-2 SSD 4k
  - (#EQ85) -Quantity 150 of #ES85 387GB SFF-2 SSD 4k
  - (#EQ8C) -Quantity 150 of #ES8C 775GB SFF-2 SSD 4k
  - (#EQ8F) -Quantity 150 of #ES8F 1.55TB SFF-2 SSD 4k
  - (#EQ8Y) -Quantity 150 of #ES8Y 931GB SFF-2 SSD 4k
  - (#EQ96) -Quantity 150 of ES96 1.86TB SFF-2 SSD 4k
  - (#EQE7) -Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k
  - (#EQG5) -Quantity 150 of #ESG5 (387GB SAS 5xx)
  - (#EQGB) -Quantity 150 of #ESGB (387GB SAS 4k)
  - (#EQGF) -Quantity 150 of #ESGF (775GB SAS 5xx)
  - (#EQGK) -Quantity 150 of #ESGK (775GB SAS 4k)
  - (#EQGP) -Quantity 150 of #ESGP (1.55TB SAS 4k)

- (#ER94) -Quantity 150 of ES94 387GB SAS 4k

- (#ERHJ) -Quantity 150 of #ESHJ 931 GB SSD 4k SFF-2

- (#ERHL) -Quantity 150 of #ESHL 1.86 TB SSD 4k SFF-2
- (#ERGV) -Quantity 150 of ESGV 387GB SSD 4k
- (#ERGZ) -Quantity 150 of ESGZ 775GB SSD 4k
- (#ERJ0) -Quantity 150 of ESJ0 931GB SAS 4k
- (#ERJ2) -Quantity 150 of ESJ2 1.86TB SAS 4k
- (#ERJ4) -Quantity 150 of ESJ4 3.72TB SAS 4k
- (#ERM8) -Quantity 150 of #ESM8 3.72 TB SSD 4k SFF-2
- (#ERNA) -Quantity 150 of ESNA 775GB SSD 4k
- (#ERNE) -Quantity 150 of ESNE 1.55TB SSD 4k
- (#ES0C) -387GB SFF-2 SSD for AIX/Linux with eMLC
- (#ES0G) -775GB SFF-2 SSD for AIX/Linux
- (#ES0L) -387GB SFF-3 SSD for AIX/Linux
- (#ES0N) -775GB SFF-3 SSD for AIX/Linux
- (#ES16) -387GB 1.8" SSD for AIX/Linux
- (#ES19) -387GB SFF-2 SSD for AIX/Linux
- (#ES0Q) -387GB SFF-2 4K SSD for AIX/Linux
- (#ES0S) -775GB SFF-2 4k SSD for AIX/Linux
- (#ES0U) -387GB SFF-3 4k SSD AIX/Linux
- (#ES0W) -775GB SFF-3 4k SSD for AIX/Linux
- (#ES0Y) -177 GB 1.8" 4k SSD Read Intensive for AIX/Linux
- (#ES0Z) -177 GB 1.8" SSD Read Intensive for AIX/Linux (528 byte)
- (#ES1C) -387GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux
- (#ES2V) -387GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux
- (#ES2X) -775GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux
- (#ES4K) -775GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux
- (#ES78) -387GB SFF-2 SSD 5xx eMLC4 for AIX/Linux
- (#ES7E) -775GB SFF-2 SSD 5xx eMLC4 for AIX/Linux
- (#ES7K) -387GB SFF-3 SSD 5xx eMLC4 for AIX/Linux
- (#ES7P) -775GB SFF-3 SSD 5xx eMLC4 for AIX/Linux
- (#ES80) -1.9TB Read Intensive SAS 4k SFF-2 SSD for AIX/Linux
- (#ES83) -931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ES85) -387GB SFF-2 SSD 4k eMLC4 for AIX/Linux
- (#ES8C) -775GB SFF-2 SSD 4k eMLC4 for AIX/Linux
- (#ES8F) -1.55TB SFF-2 SSD 4k eMLC4 for AIX/Linux
- (#ES8J) -1.9TB Read Intensive SAS 4k SFF-3 SSD for AIX/Linux
- (#ES8N) -387GB SFF-3 SSD 4k eMLC4 for AIX/Linux
- (#ES8Q) -775GB SFF-3 SSD 4k eMLC4 for AIX/Linux
- (#ES8V) -1.55TB SFF-3 SSD 4k eMLC4 for AIX/Linux
- (#ES8Y) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ES90) -387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ES92) -1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ES94) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ES96) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESB0) -387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESB2) -387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESB4) -775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESB6) -775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESB8) -387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESBA) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESBE) -775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESBG) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESBJ) -1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESBL) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESE1) -3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESE7) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESG5) -387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESG9) -387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESGB) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESGD) -387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESGF) -775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESGH) -775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESGK) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESGM) -775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESGP) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESGR) -1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESGT) -387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESGV) -387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESGX) -775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
- (#ESGZ) -775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

- (#ESHJ) -931 GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESHL) -1.86 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESHS) -931 GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESHT) -931 GB Mainstream SAS 4k SFF-3 SSD for IBM i
- (#ESHU) -1.86 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJ0) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ2) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ4) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ8) -931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJA) -1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJC) -3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESM8) -3.72 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESMQ) -3.72 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESNA) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESNC) -775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESNE) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESNG) -1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
- (#ESQ2) -Quantity 150 of ESB2 387GB SAS 4k
- (#ESQ6) -Quantity 150 of ESB6 775GB SAS 4k
- (#ESQA) -Quantity 150 of ESBA 387GB SAS 4k
- (#ESQG) -Quantity 150 of ESBG 775GB SAS 4k
- (#ESQL) -Quantity 150 of ESBL 1.55TB SAS 4k
- Specify Codes
  - (#0265) -AIX Partition Specify
  - (#0266) -Linux Partition Specify
  - (#0267) -IBM i Operating System Partition Specify
  - (#0567) -IBM i 7.1 Specify Code
  - (#0728) -Specify #5887 or #EL1S Load Source placement
  - (#0837) -SAN Load Source Specify
  - (#EB72) -IBM i 7.2 Indicator
  - (#EB73) -IBM i 7.3 Indicator
  - (#EB74) -IBM i 7.4 Indicator
  - (#EHR1) -Boot Drive / Load Source in EXP12SX Specify (in #ESLL or #ELLL)
  - (#EHR2) -Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)
- Virtualization Engine
  - (#5227) -PowerVM Standard Edition
  - (#5228) -PowerVM Enterprise Edition
  - (#EC2A) -CAPI Activation
  - (#ELPM) -Trial PowerVM Live Partition Mobility for POWER8 and below Clients on PowerVM Standard edition

Feature availability matrix

The following feature availability matrix for MT 8284 uses the letter "A" to indicate features that are available and orderable on the specified models. "S" indicates a feature that is supported on the new model during a model conversion; these features will work on the new model, but additional quantities of these features cannot be ordered on the new model; they can only be removed. "N" indicates that the feature is not supported on the new model and must be removed during the model conversion. As additional features are announced, supported, or withdrawn, this list will be updated. Please check with your Marketing Representative for additional information.

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         |2|  A = AVAILABLE   S = SUPPORTED
         |2|  N = NOT SUPPORTED, MUST BE REMOVED
         |A|
         | |
         | |
FEAT/PN  | |        DESCRIPTION
---------|-|---------------------------------------------------------


0010     |A| One CSC Billing Unit
0011     |A| Ten CSC Billing Units



0265     |A| AIX Partition Specify
0266     |A| Linux Partition Specify
0267     |A| IBM i Operating System Partition Specify
0348     |A| V.24/EIA232 6.1m (20-Ft) PCI Cable
0353     |A| V.35 6.1m (20-Ft) PCI Cable
0359     |A| X.21 6.1m (20-Ft) PCI Cable



0444     |S| CBU Specify
0456     |S| Customer Specified Placement
0465     |S| SSD Placement Indicator - 5887, EL1S
0551     |A| 19 inch, 1.8 meter high rack
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0553     |A|  19 inch, 2.0 meter high rack
0567     |S|  IBM i 7.1 Specify Code
0599     |A|  Rack Filler Panel Kit
0709     |S|  Flexible Thermal Settings for NEBS Applications
0712     |S|  Power Cloud Integrated Solution Indicator For Order Routing
0719     |A|  Load Source Not in CEC
0728     |S|  Specify #5887 or #EL1S Load Source placement
0837     |A|  SAN Load Source Specify


1025     |S|  Modem Cable - US/Canada and General Use
1107     |A|  USB 500 GB Removable Disk Drive
1140     |A|  Custom Service Specify, Rochester Minn, USA
1752     |S|  900GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
1818     |A|  Quantity 150 of #1964
1866     |S|  Quantity 150 of #1917
1869     |S|  Quantity 150 of #1925
1917     |S|  146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
1925     |S|  300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
1929     |A|  Quantity 150 of #1953
1953     |A|  300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
1964     |A|  600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)
2146     |A|  Primary OS - AIX
2147     |A|  Primary OS - Linux
2148     |A|  IBM i with VIOS Only System Indicator
2319     |S|  Factory Deconfiguration of 1-core
2456     |A|  2M LC-SC 50 Micron Fiber Converter Cable
2459     |A|  2M LC-SC 62.5 Micron Fiber Converter Cable
2934     |A|  3M Asynchronous Terminal/Printer Cable EIA-232
2936     |A|  Asynchronous Cable EIA-232/V.24 3M
3124     |A|  Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M
3125     |A|  Serial-to-Serial Port Cable for Rack/Rack- 8M
3287     |A|  1m, (3.3-ft) IB 40G Copper Cable QSFP/QSFP
3288     |A|  3m, (9.8-ft.) IB 40G Copper Cable QSFP/QSFP
3289     |S|  5m QDR IB/E'Net Copper Cable QSFP/QSFP
3290     |S|  10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP
3293     |S|  30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP
3450     |S|  SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure
3451     |S|  SAS YO Cable 3m - HD 6Gb Adapter to Enclosure
3452     |S|  SAS YO Cable 6m - HD 6Gb Adapter to Enclosure
3453     |A|  SAS YO Cable 10m - HD 6Gb Adapter to Enclosure
3454     |A|  SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure
3455     |A|  SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure
3456     |S|  SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure
3457     |S|  SAS YO Cable 15m - HD 3Gb Adapter to Enclosure
3458     |A|  SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure
3632     |S|  Widescreen LCD Monitor
3661     |A|  SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/
         |  |Dual Path 3M:
3662     |A|  SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/
         |  |Dual Path 6M:
3663     |S|  SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/
         |  |Dual Path 15M:
3681     |S|  3M SAS CABLE, ADPTR TO ADPTR (AA)
3684     |A|  SAS Cable (AE) Adapter to Enclosure, single controller/
         |  |single path 3M
3685     |S|  SAS Cable (AE) Adapter to Enclosure, single controller/
         |  |single path 6M
3691     |A|  SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/
         |  |Dual Path 1.5 M
3692     |A|  SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/
         |  |Dual Path 3 M
3693     |A|  SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/
         |  |Dual Path 6 M
3694     |S|  SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/
         |  |Dual Path 15 M
3925     |A|  0.3M Serial Port Converter Cable, 9-Pin to 25-Pin
3927     |A|  Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M
3928     |A|  Serial Port Null Modem Cable, 9-pin to 9-pin, 10M
3930     |A|  System Serial Port Converter Cable
4242     |S|  1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell
         |  |to 15-pin D-shell)
4256     |A|  Extender Cable - USB Keyboards, 1.8M
4276     |A|  VGA to DVI Connection Converter
4648     |A|  Rack Integration Services: BP only
4649     |S|  Rack Integration Services

One and only one rack indicator feature is required onall orders (#4650 to #4666).
4650     |S|  Rack Indicator- Not Factory Integrated
4651     |S|  Rack Indicator, Rack #1
4652     |S|  Rack Indicator, Rack #2
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4653   |S| Rack Indicator, Rack #3
4654   |S| Rack Indicator, Rack #4
4655   |S| Rack Indicator, Rack #5
4656   |S| Rack Indicator, Rack #6
4657   |S| Rack Indicator, Rack #7
4658   |S| Rack Indicator, Rack #8
4659   |S| Rack Indicator, Rack #9
4660   |S| Rack Indicator, Rack #10
4661   |S| Rack Indicator, Rack #11
4662   |S| Rack Indicator, Rack #12
4663   |S| Rack Indicator, Rack #13
4664   |S| Rack Indicator, Rack #14
4665   |S| Rack Indicator, Rack #15
4666   |S| Rack Indicator, Rack #16
4793   |A| Power Active Memory Expansion Enablement
5000   |S| Software Preload Required
5227   |A| PowerVM Standard Edition
5228   |A| PowerVM Enterprise Edition
5260   |A| PCIe2 LP 4-port 1GbE Adapter
5269   |A| PCIe LP POWER GXT145 Graphics Accelerator
5270   |S| PCIe LP 10Gb FCoE 2-port Adapter
5271   |S| PCIe LP 4-Port 10/100/1000 Base-TX Ethernet Adapter
5273   |S| PCIe LP 8Gb 2-Port Fibre Channel Adapter
5274   |S| PCIe LP 2-Port 1GbE SX Adapter
5275   |S| PCIe LP 10GbE SR 1-port Adapter
5276   |S| PCIe LP 4Gb 2-Port Fibre Channel Adapter
5277   |A| PCIe LP 4-Port Async EIA-232 Adapter
5278   |S| PCIe LP 2-x4-port SAS Adapter 3Gb
5280   |S| PCIe2 LP 4-Port 10GbE&1GbE SR&RJ45 Adapter
5281   |S| PCIe LP 2-Port 1GbE TX Adapter
5283   |S| PCIe2 LP 2-Port 4X IB QDR Adapter 40Gb
5284   |S| PCIe2 LP 2-port 10GbE SR Adapter
5285   |S| PCIe2 2-Port 4X IB QDR Adapter 40Gb
5287   |S| PCIe2 2-port 10GbE SR Adapter
5290   |N| PCIe LP 2-Port Async EIA-232 Adapter
5708   |S| 10Gb FCoE PCIe Dual Port Adapter
5717   |S| 4-Port 10/100/1000 Base-TX PCI Express Adapter
5729   |S| PCIe2 8Gb 4-port Fibre Channel Adapter
5735   |S| 8 Gigabit PCI Express Dual Port Fibre Channel Adapter
5744   |S| PCIe2 4-Port 10GbE&1GbE SR&RJ45 Adapter
5767   |S| 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter
5768   |S| 2-Port Gigabit Ethernet-SX PCI Express Adapter
5769   |S| 10 Gigabit Ethernet-SR PCI Express Adapter
5771   |A| SATA Slimline DVD-RAM Drive
5774   |S| 4 Gigabit PCI Express Dual Port Fibre Channel Adapter
5785   |A| 4 Port Async EIA-232 PCIe Adapter
5805   |S| PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter
5887   |S| EXP24S SFF Gen2-bay Drawer
5899   |A| PCIe2 4-port 1GbE Adapter
5901   |S| PCIe Dual-x4 SAS Adapter
5913   |S| PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb
5915   |A| SAS AA Cable 3m - HD 6Gb Adapter to Adapter
5916   |A| SAS AA Cable 6m - HD 6Gb Adapter to Adapter
5917   |A| SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter
5918   |A| SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter
5923   |S| Non-paired PCIe SAS RAID Indicator
5924   |S| Non-paired Indicator 5913 PCIe SAS RAID Adapter
6068   |A| Opt Front Door for 1.8m Rack
6069   |A| Opt Front Door for 2.0m Rack
6248   |A| 1.8m Rack Acoustic Doors
6249   |A| 2.0m Rack Acoustic Doors
6263   |A| 1.8m Rack Trim Kit
6272   |A| 2.0m Rack Trim Kit
6458   |A| Pwr Crd 4.3m 14ft to IBM PDU
6460   |A| Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)
6469   |A| Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A)
       | |U. S.
6470   |A| Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)
6471   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)
6472   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)
6473   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)
6474   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/13A)
6475   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)
6476   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)
6477   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)
6478   |A| Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)
6488   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (125V/15A
       | |or 250V/10A )
6489   |A| 4.3m (14-Ft) 3PH/32A 380-415V Power Cord
6491   |A| 4.3m (14-Ft) 1PH/63A 200-240V Power Cord
6492   |A| 4.3m (14-Ft) 1PH/48A 200-240V Power Cord
6493   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)
6494   |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)
6496   |A| Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
6577   |A| Power Cable - Drawer to IBM PDU, 200-240V/10A
6580   |A| Optional Rack Security Kit
6586   |S| Modem Tray for 19-Inch Rack
6651   |A| Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)
6653   |A| 4.3m (14-Ft) 3PH/16A 380-415V Power Cord
6654   |A| 4.3m (14-Ft) 1PH/24A Power Cord
6655   |A| 4.3m (14-Ft) 1PH/24A WR Power Cord
6656   |A| 4.3m (14-Ft) 1PH/32A Power Cord
6657   |A| 4.3m (14-Ft) 1PH/32A Power Cord
6658   |A| 4.3m (14-Ft) 1PH/24A Power Cord-Korea
6659   |A| Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)
6660   |A| Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/15A)
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6665    |A| Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)
6667    |A| 4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia
6669    |A| Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)
6671    |A| Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A
6672    |A| Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A
6680    |A| Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)
7109    |S| Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
7118    |A| Environmental Monitoring Probe
7188    |A| Power Distribution Unit
7196    |S| Power Distribution Unit (US) - 1 EIA Unit, Universal,
        | |Fixed Power Cord


7802    |A| Ethernet Cable, 15m, Hardware Management Console to System
        | |Unit
8143    |S| Linux Software Preinstall
8144    |S| Linux Software Preinstall (Business Partners)
8845    |S| USB Mouse
9169    |S| Order Routing Indicator- System Plant
9300    |S| Language Group Specify - US English
9359    |S| specify mode-1 & (1)5901/5278 for EXP24S #5887/EL1S
9360    |S| Specify mode-1 & (2)5901/5278 for EXP24S #5887/EL1S
9361    |S| Specify mode-2 & (2)5901/5278 for EXP24S #5887/EL1S
9365    |S| Specify mode-4 & (4)5901/5278 for EXP24S #5887/EL1S
9366    |S| Specify mode-2 & (4)5901/5278 for EXP24S #5887/EL1S
9367    |S| Specify mode-1 & (2)5903/5805 for EXP24S #5887/EL1S
9368    |S| Specify mode-2 & (4)5903/5805 for EXP24S #5887/EL1S
9385    |S| Specify mode-1 & (2) 5913 for EXP24S #5887/EL1S
9386    |S| Specify mode-2 & (4) 5913 for EXP24S #5887/EL1S
9387    |S| Specify mode-1 & CEC SAS port for EXP24 #5887/EL1S
9440    |S| New AIX License Core Counter
9441    |S| New IBM i License Core Counter
9442    |S| New Red Hat License Core Counter
9443    |S| New SUSE License Core Counter
9444    |S| Other AIX License Core Counter
9445    |S| Other Linux License Core Counter
9446    |S| 3rd Party Linux License Core Counter
9447    |S| VIOS Core Counter
9449    |S| Other License Core Counter
9450    |S| Ubuntu Linux License Core Counter
9461    |S| Month Indicator
9462    |S| Day Indicator
9463    |S| Hour Indicator
9464    |S| Minute Indicator
9465    |S| Qty Indicator
9466    |S| Countable Member Indicator
9700    |S| Language Group Specify - Dutch
9703    |S| Language Group Specify - French
9704    |S| Language Group Specify - German
9705    |S| Language Group Specify - Polish
9706    |S| Language Group Specify - Norwegian
9707    |S| Language Group Specify - Portuguese
9708    |S| Language Group Specify - Spanish
9711    |S| Language Group Specify - Italian
9712    |S| Language Group Specify - Canadian French
9714    |S| Language Group Specify - Japanese
9715    |S| Language Group Specify - Traditional Chinese (Taiwan)
9716    |S| Language Group Specify - Korean
9718    |S| Language Group Specify - Turkish
9719    |S| Language Group Specify - Hungarian
9720    |S| Language Group Specify - Slovakian
9721    |S| Language Group Specify - Russian
9722    |S| Language Group Specify - Simplified Chinese (PRC)
9724    |S| Language Group Specify - Czech
9725    |S| Language Group Specify -- Romanian
9726    |S| Language Group Specify - Croatian
9727    |S| Language Group Specify -- Slovenian
9728    |S| Language Group Specify - Brazilian Portuguese
9729    |S| Language Group Specify - Thai
B0LG    |S| ServicePac Not Selected
B0LH    |S| Service Renewal Requested
B0UQ    |A| SP WSU 3Y 24x7 SD


    B0VC    |A| ServicePac for Basic Selection for Power 3 years


B0VH    |A| SP HDR/MR POWER 3Y
EBA5    |S| HVDC PDU Horizontal Mounting
EB27    |A| QSFP+ 40GBase-SR Transceiver
EB2B    |A| 1m (3.3-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
EB2H    |A| 3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
EB2J    |A| 10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable
EB2K    |A| 30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable
EB2M    |A| AC Power Supply - 1400W for System Unit (200-240 VAC)
EB2N    |S| DC Power Supply - 1400W (180-400V)
EB3H    |S| 750 Watt, -48V DC Hot-Swap Power Supply
EB3Z    |A| Lift tool based on GenieLift GL-8 (standard)
EB40    |A| 0.5M FDR IB / 40GbE Copper Cable QSFP
EB41    |A| 1M FDR IB / 40GbE Copper Cable QSFP
EB42    |A| 2M FDR IB / 40GbE Copper Cable QSFP
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EB4A    |A|  3M FDR IB / 40GbE Optical Cable SFP
EB4B    |A|  5M FDR IB / 40GbE Optical Cable QSFP
EB4C    |A|  10M FDR IB / 40GbE Optical Cable QSFP
EB4D    |A|  15M FDR IB / 40GbE Optical Cable QSFP
EB4E    |A|  20M FDR IB / 40GbE Optical Cable QSFP
EB4F    |A|  30M FDR IB / 40GbE Optical Cable QSFP
EB4G    |S|  50M FDR IB / 40GbE Optical Cable QSFP
EB4Z    |A|  Service wedge shelf tool kit for EB3Z
EB50    |S|  0.5M EDR IB Copper Cable QSFP28
EB51    |A|  1.0M  EDR IB Copper Cable QSFP28
EB52    |A|  2.0M EDR IB Copper Cable QSFP28
EB54    |A|  1.5M EDR IB Copper Cable QSFP28
EB59    |A|  100Gb Optical Transceiver QSFP28
EB5A    |A|  3M EDR IB Optical Cable QSFP28
EB5B    |A|  5M EDR IB Optical Cable QSFP28
EB5C    |A|  10M EDR IB Optical Cable QSFP28
EB5D    |A|  15M EDR IB Optical Cable QSFP28
EB5E    |A|  20M EDR IB Optical Cable QSFP28
EB5F    |A|  30M EDR IB Optical Cable QSFP28
EB5G    |A|  50M EDR IB Optical Cable QSFP28
EB5H    |A|  100M EDR IB Optical Cable QSFP28
EB5J    |A|  0.5M 100GbE Copper Cable QSFP28
EB5K    |A|  1.0M 100GbE Copper Cable QSFP28
EB5L    |A|  1.5M 100GbE Copper Cable QSFP28
EB5M    |A|  2.0M 100GbE Copper Cable QSFP28
EB5N    |S|  25M EDR IB Optical Cable QSFP28
EB5R    |A|  3M 100GbE Optical Cable QSFP28 (AOC)
EB5S    |A|  5M 100GbE Optical Cable QSFP28 (AOC)
EB5T    |A|  10M 100GbE Optical Cable QSFP28 (AOC)
EB5U    |A|  15M 100GbE Optical Cable QSFP28 (AOC)
EB5V    |A|  20M 100GbE Optical Cable QSFP28 (AOC)
EB5W    |A|  30M 100GbE Optical Cable QSFP28 (AOC)
EB5X    |A|  50M 100GbE Optical Cable QSFP28 (AOC)
EB5Y    |A|  100M 100GbE Optical Cable QSFP28 (AOC)
EB72    |S|  IBM i 7.2 Indicator
EB73    |A|  IBM i 7.3 Indicator
EB74    |A|  IBM i 7.4 Indicator
EBC0    |S|  Blockchain on Power
EC01    |S|  Rack Front Door (Black)
EC02    |S|  Rack Rear Door
EC03    |S|  Rack Side Cover
EC04    |S|  Rack Suite Attachment Kit
EC07    |A|  Slim Rear Acoustic Door
EC08    |A|  Slim Front Acoustic Door
EC15    |S|  Rear Door Heat Exchanger for 2.0 Meter Slim Rack
EC27    |S|  PCIe2 LP 2-Port 10GbE RoCE SFP+ Adapter
EC28    |S|  PCIe2 2-Port 10GbE RoCE SFP+ Adapter
EC29    |S|  PCIe2 LP 2-Port 10GbE RoCE SR Adapter
EC2A    |A|  CAPI Activation
EC2G    |S|  PCIe2 LP 2-port 10GbE SFN6122F Adapter
EC2J    |S|  PCIe2 2-port 10GbE SFN6122F Adapter
EC2M    |S|  PCIe3 LP 2-port 10GbE NIC&RoCE SR Adapter
EC2N    |S|  PCIe3 2-port 10GbE NIC&RoCE SR Adapter
EC30    |S|  PCIe2 2-Port 10GbE RoCE SR Adapter
EC32    |A|  PCIe3 LP 2-port 56Gb FDR IB Adapter x16
EC37    |S|  PCIe3 LP 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
EC38    |S|  PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
EC3A    |S|  PCIe3 LP 2-Port 40GbE NIC RoCE QSFP+ Adapter
EC3B    |S|  PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter
EC3E    |S|  PCIe3 LP 2-port 100Gb EDR IB Adapter x16
EC3L    |S|  PCIe3 LP 2-port 100GbE (NIC& RoCE) QSFP28 Adapter x16
EC3T    |S|  PCIe3 LP 1-port 100Gb EDR IB Adapter x16
EC41    |S|  PCIe2 LP 3D Graphics Adapter x1
EC45    |S|  PCIe2 LP 4-Port USB 3.0 Adapter
EC46    |S|  PCIe2 4-Port USB 3.0 Adapter
EC51    |A|  PCIe3 LP 3D Graphics Adapter x16
EC54    |S|  PCIe3 LP 1.6TB NVMe Flash Adapter
EC56    |S|  PCIe3 LP 3.2TB NVMe Flash Adapter
ECBJ    |A|  SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure
ECBK    |A|  SAS X Cable 6m - HD Narrow 6Gb 2-Adapters to Enclosure
ECBL    |S|  SAS X Cable 10m - HD Narrow 6Gb 2-Adapters to Enclosure
ECBM    |A|  SAS X Cable 15m - HD Narrow 3Gb 2-Adapters to Enclosure
ECBN    |S|  5m (16.4-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)
ECBT    |A|  SAS YO Cable 1.5m - HD Narrow 6Gb Adapter to Enclosure
ECBU    |A|  SAS YO Cable 3m - HD Narrow 6Gb Adapter to Enclosure
ECBV    |A|  SAS YO Cable 6m - HD Narrow 6Gb Adapter to Enclosure
ECBW    |A|  SAS YO Cable 10m - HD Narrow 6Gb Adapter to Enclosure
ECBX    |S|  SAS YO Cable 15m - HD Narrow 3Gb Adapter to Enclosure
ECBY    |A|  SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure
ECBZ    |A|  SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure
ECC0    |A|  SAS AA Cable 0.6m - HD Narrow 6Gb Adapter to Adapter
ECC2    |A|  SAS AA Cable 1.5m - HD Narrow 6Gb Adapter to Adapter
ECC3    |A|  SAS AA Cable 3m - HD Narrow 6Gb Adapter to Adapter
ECC4    |S|  SAS AA Cable 6m - HD Narrow 6Gb Adapter to Adapter
ECC7    |A|  3M Optical Cable Pair for PCIe3 Expansion Drawer
ECC8    |A|  10M Optical Cable Pair for PCIe3 Expansion Drawer
ECCF    |A|  System Port Converter Cable for UPS
ECCG    |S|  Variable Length, Blue Cat5e Cable
ECCH    |S|  Variable Length, Green Cat5e Cable
ECCJ    |S|  Variable Length, Yellow Cat5e Cable
ECCK    |S|  Variable Length FIBRE SAN CABLE
ECCN    |S|  Variable Length DAC QSFP+ TO QSFP+ CABLE
ECCS    |A|  3M Copper CXP Cable Pair for PCIe3 Expansion Drawer
ECDJ    |A|  3.0M SAS X12 Cable (Two Adapter to Enclosure)
ECDK    |A|  4.5M SAS X12 Active Optical Cable (Two Adapter to
        | |Enclosure)
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ECDL    |A| 10M SAS X12 Active Optical Cable (Two Adapter to Enclosure)
ECDT    |A| 1.5M SAS YO12 Cable (Adapter to Enclosure)
ECDU    |A| 3.0M SAS YO12 Cable (Adapter to Enclosure)
ECDV    |A| 4.5M SAS YO12 Active Optical Cable (Adapter to Enclosure)
ECDW    |A| 10M SAS YO12 Active Optical Cable (Adapter to Enclosure)
ECE0    |A| 0.6M SAS AA12 Cable (Adapter to Adapter)
ECE3    |A| 3.0M SAS AA12 Cable
ECE4    |A| 4.5M SAS AA12 Active Optical Cable (Adapter to Adapter)
ECJ5    |A| 4.3m (14-Ft) PDU to Wall 3PH/24A 200-240V Delta-wired Power
        |  |Cord
ECJ7    |A| 4.3m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power
        |  |Cord
ECJJ    |A| High Function 9xC19 Single-Phase or Three-Phase Wye PDU plus
ECJL    |A| High Function 9xC19 PDU plus 3-Phase Delta
ECJN    |A| High Function 12xC13 Single-Phase or Three-Phase Wye PDU plus
ECJQ    |A| High Function 12xC13 PDU plus 3-Phase Delta
ECP0    |S| Cloud Private Solution
ECR0    |A| 2.0 Meter Slim Rack
ECRF    |A| Rack Front Door High-End appearance
ECRG    |A| Rack Rear Door Black
ECRJ    |A| Rack Side Cover
ECRK    |A| Rack Rear Extension 5-In
ECRM    |A| Rack Front Door for Rack (Black/Flat)




ECSC    |A| Custom Service Specify, Shenzhen, China
ECSF    |A| Custom Service Specify, Montpellier, France




ECSM    |A| Custom Service Specify, Mexico
ECSP    |A| Custom Service Specify, Poughkeepsie, USA
ECSS    |S| Integrated Solution Packing
ECW0    |A| Optical Wrap Plug
EHCE    |S| IBM Cognos Business Intelligence
EHDS    |S| InfoSphere Information Server (IIS) / Data Stage
EHJD    |S| PureApp Gen3 Consolidation Feature
EHJL    |A| P8 S822 Build Ahead / Specify
EHKV    |S| SAP HANA TRACKING FEATURE
EHKX    |S| PurePower Base Indicator
EHR1    |A| Boot Drive / Load Source in EXP12SX Specify (in #ESLL or
        |  |#ELLL)
EHR2    |A| Boot Drive / Load Source in EXP24SX Specify (in #ESLS or
        |  |#ELLS)
EHS2    |A| SSD Placement Indicator - #ESLS/#ELLS
EHSS    |S| SPSS Modeler Server Gold
EJ05    |A| PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer
EJ0J    |A| PCIe3 RAID SAS Adapter Quad-port 6Gb x8
EJ0L    |A| PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
EJ0M    |A| PCIe3 LP RAID SAS ADAPTER Quad-Port 6Gb x8
EJ0T    |S| Storage Backplane 12 SFF-3 Bays/DVD Bay
EJ0U    |S| Storage Backplane 8 SFF-3 Bays/six 1.8-inch SSD bays/
        |  |DVD Bay/Dual IOA with Write Cache
EJ0V    |S| Split #EJ0T to 6+6 SFF-3 Bays: Add 2nd SAS Controller
EJ10    |A| PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
EJ11    |A| PCIe3 LP SAS Tape/DVD Adapter Quad-port 6Gb x8
EJ13    |S| PCIe3 LP FPGA Accelerator Adapter
EJ14    |A| PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
EJ18    |S| PCIe3 LP CAPI FlashSystem Accelerator Adapter
EJ1N    |S| PCIe1 LP SAS Tape/DVD Dual-port 3Gb x8 Adapter
EJ1P    |S| PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter
EJ28    |S| PCIe Crypto Coprocessor Gen3 BSC 4765-001
EJ33    |S| PCIe3 Crypto Coprocessor BSC-Gen3 4767
EJPJ    |S| Specify mode-2 (1)5901/5278 for EXP24 #5887 or #EL1S
EJPK    |S| Specify mode-2 (2)5901/5278 for EXP24 #5887 or #EL1S
EJPL    |S| Specify mode-4 (1)5901/5278 for EXP24 #5887 or #EL1S
EJPM    |S| Specify mode-4 (2)5901/5278 for EXP24 #5887 or #EL1S
EJPN    |S| Specify mode-4 (3)5901/5278 for EXP24 #5887 or #EL1S
EJPR    |S| Specify mode-2 (2)5903/5805 for EXP24 #5887 or #EL1S
EJPT    |S| Specify mode-2 (2)5913 for EXP24 #5887 or #EL1S
EJR1    |S| Specify Mode-1 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S))
EJR2    |S| Specify Mode-1 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S))
EJR3    |S| Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) X for EXP24S
        |  |(#5887/EL1S)
EJR4    |S| Specify Mode-2 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
EJR5    |S| Specify Mode-4 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
EJR6    |S| Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (2) YO for EXP24S
        |  |(#5887/EL1S)
EJR7    |S| Specify Mode-2 & (2)EJ0J/EJ0M/EL3B  & (2) YO for EXP24S
        |  |(#5887/EL1S)
EJRA    |S| Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (1) YO for EXP24S
        |  |(#5887/El1S)
EJRB    |S| Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (1) X for EXP24S
        |  |(#5887/EL1S)
EJRC    |S| Specify Mode-4 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
EJRD    |S| Specify Mode-4 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)
EJRE    |S| Specify Mode-4 & (3)EJ0J/EJ0M/EL3B for EXP24S (#5888/EL1S)
EJRF    |S| Specify Mode-1 & (2)EJ14 for EXP24S (#5887/EL1S)
EJRG    |S| Specify Mode-2 & (2)EJ14 & (2) X  for EXP24S (#5887/EL1S)
EJRH    |S| Specify Mode-2 & (2)EJ14 & (1) X  for EXP24S (#5887/EL1S)
EJRJ    |S| Specify Mode-2 & (4)EJ14 for EXP24S (#5887/EL1S)
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EJRP   |S|  Specify Mode-1 & (2)EJ0L for EXP24S (#5887/EL1S)
EJRR   |S|  Specify mode-2 & (4) EJ0L for EXP24S #5887/EL1S
EJRS   |S|  Specify Mode-2 & (2)EJ0L & (2) X for EXP24S (#5887/EL1S)
EJRT   |S|  Specify Mode-2 & (2)EJ0L & (1) X for EXP24S (#5887/EL1S)
EJRU   |A|  Non-paired Indicator EJ0L PCIe SAS RAID Adapter
EJS1   |A|  Non-paired Indicator ESA3 PCIe SAS RAID Adapter
EJS2   |S|  Specify Mode-2 & (2)ESA3 for EXP24S (#5887/#EL1S)
EJS3   |S|  Specify Mode-1 & (2)ESA3 for EXP24S (#5887/#EL1S)
EJS4   |S|  Specify Mode-2 & (4)ESA3 for EXP24S (#5887/#EL1S)
EJT4   |S|  Front Bezel for 12-Bay BackPlane
EJT5   |S|  Front Bezel for 8-Bay BackPlane
EJT6   |A|  Front OEM Bezel for 12-Bay BackPlane
EJT7   |A|  Front OEM Bezel for 8-Bay BackPlane
EJTL   |S|  Six-bay 1.8-inch SSD Cage
EJV0   |A|  Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP12SX #ESLL/
       |    |ELLL
EJV1   |A|  Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for
       |    |EXP12SX #ESLL/ELLL
EJV2   |A|  Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP12SX #ESLL/ELLL
EJV3   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP12SX #ESLL/ELLL
EJV4   |A|  Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP12SX #ESLL/ELLL
EJV5   |A|  Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP12SX #ESLL/ELLL
EJV6   |A|  Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP12SX #ESLL/ELLL
EJV7   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP12SX #ESLL/ELLL
EJVA   |A|  Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for
       |    |EXP12SX #ESLL/ELLL
EJVB   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP12SX #ESLL/ELLL
EJVC   |A|  Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP12SX #ESLL/ELLL
EJVD   |A|  Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP12SX #ESLL/ELLL
EJVE   |A|  Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP12SX #ESLL/ELLL
EJVF   |A|  Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL
EJVG   |S|  Specify Mode-2 & (2)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL
EJVH   |S|  Specify Mode-2 & (2)EJ14 & (1)X12 for EXP12SX #ESLL/ELLL
EJVJ   |S|  Specify Mode-2 & (4)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL
EJVP   |A|  Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ELLL
EJVR   |S|  Specify Mode-2 & (4)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL
EJVS   |S|  Specify Mode-2 & (2)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL
EJVT   |S|  Specify Mode-2 & (2)EJ0L& (1)X12 for EXP12SX #ESLL/ELLL
EJW0   |A|  Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP24SX #ESLS/
       |    |ELS
EJW1   |A|  Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for
       |    |EXP24SX #ESLS/ELLS
EJW2   |A|  Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP24SX #ESLS/ELLS
EJW3   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP24SX #ESLS/ELLS
EJW4   |A|  Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP24SX #ESLS/ELLS
EJW5   |A|  Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP24SX #ESLS/ELLS
EJW6   |A|  Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP24SX #ESLS/ELLS
EJW7   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for
       |    |EXP24SX #ESLS/ELLS
EJWA   |A|  Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for
       |    |EXP24SX #ESLS/ELLS
EJWB   |A|  Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP24SX #ESLS/ELLS
EJWC   |A|  Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP24SX #ESLS/ELLS
EJWD   |A|  Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for
       |    |EXP24SX #ESLS/ELLS
EJWE   |A|  Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for
       |    |EXP24SX #ESLS/ELLS
EJWF   |A|  Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ELLS
EJWG   |A|  Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
EJWH   |A|  Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS
EJWJ   |A|  Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
EJWP   |A|  Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP24SX #ESLS/ELLS
EJWR   |A|  Specify Mode-2 & (4)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS
EJWS   |A|  Specify Mode-2 & (2)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS
EJWT   |A|  Specify Mode-2 & (2)EJ0L& (1)X12 for EXP24SX #ESLS/ELLS
EK51   |S|  Full Width Keyboard -- USB, US English, #103P
EK52   |S|  Full Width Keyboard -- USB, French, #189
EK53   |S|  Full Width Keyboard -- USB, Italian, #142
EK54   |S|  Full Width Keyboard -- USB, German/Austrian, #129
EK55   |S|  Full Width Keyboard -- USB, UK English, #166P
EK56   |S|  Full Width Keyboard -- USB, Spanish, #172
EK57   |S|  Full Width Keyboard -- USB, Japanese, #194
EK58   |S|  Full Width Keyboard -- USB, Brazilian Portuguese, #275
EK59   |S|  Full Width Keyboard -- USB, Hungarian, #208
EK60   |S|  Full Width Keyboard -- USB, Korean, #413
EK61   |S|  Full Width Keyboard -- USB, Chinese, #467
EK62   |S|  Full Width Keyboard -- USB, French Canadian, #445
EK64   |S|  Full Width Keyboard -- USB, Belgian/UK, #120
EK65   |S|  Full Width Keyboard -- USB, Swedish/Finnish, #153
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EK66    |S| Full Width Keyboard -- USB, Danish, #159
EK67    |S| Full Width Keyboard -- USB, Bulgarian, #442
EK68    |S| Full Width Keyboard -- USB, Swiss/French/German, #150
EK69    |S| Full Width Keyboard -- USB, Norwegian,#155
EK70    |S| Full Width Keyboard -- USB, Dutch, #143
EK71    |S| Full Width Keyboard -- USB, Portuguese, #163
EK72    |S| Full Width Keyboard -- USB, Greek, #319
EK73    |S| Full Width Keyboard -- USB, Hebrew, #212
EK74    |S| Full Width Keyboard -- USB, Polish, #214
EK75    |S| Full Width Keyboard -- USB, Slovakian, #245
EK76    |S| Full Width Keyboard -- USB, Czech, #243
EK77    |S| Full Width Keyboard -- USB, Turkish, #179
EK78    |S| Full Width Keyboard -- USB, LA Spanish, #171
EK79    |S| Full Width Keyboard -- USB, Arabic, #253
EK80    |S| Full Width Keyboard -- USB, Thai, #191
EK81    |S| Full Width Keyboard -- USB, Russian, #443
EK82    |S| Full Width Keyboard -- USB, Slovenian, #234
EK83    |S| Full Width Keyboard -- USB, US English Euro, #103P
ELC0    |A| PDU Access Cord 0.38m
ELC5    |A| Power Cable - Drawer to IBM PDU (250V/10A)
ELPM    |A| Trial PowerVM Live Partition Mobility for POWER8 and below
        |  |Clients on PowerVM Standard edition
EM83    |S| 16GB CDIMM, 1600MHZ, 4GBIT DDR3 DRAM, Short
EM84    |S| 32 GB DDR3 Memory
EM85    |S| 64 GB DDR3 Memory
EM8P    |S| 16 GB DDR4 Memory
EM8Q    |S| 32 GB DDR4 Memory
EM8R    |S| 64 GB DDR4 Memory
EM96    |S| 16 GB DDR4 Memory
EM97    |A| 32 GB DDR4 Memory
EM98    |A| 64 GB DDR4 Memory
EN12    |S| PCIe2 8Gb 4-port Fibre Channel Adapter
EN15    |A| PCIe3 4-port 10GbE SR Adapter
EN17    |S| PCIe3 4-port 10GbE SFP+ Copper Adapter
EN27    |S| 2 Port Async EIA-232 PCIe Adapter
EMX0    |A| PCIe Gen3 I/O Expansion Drawer
EMXA    |A| AC Power Supply Conduit for PCIe3 Expansion Drawer
EMXB    |S| DC Power Supply Conduit for PCIe3 Expansion Drawer
EMXF    |S| PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
EMXG    |S| PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
EN01    |A| 1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper
EN02    |A| 3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper
EN03    |A| 5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper
EN0A    |A| PCIe3 16Gb 2-port Fibre Channel Adapter
EN0B    |A| PCIe3 LP 16Gb 2-port Fibre Channel Adapter
EN0F    |S| PCIe2 LP 8Gb 2-Port Fibre Channel Adapter
EN0G    |S| PCIe2 8Gb 2-Port Fibre Channel Adapter
EN0H    |S| PCIe3 4-port (10Gb FCoE & 1GbE) SR&RJ45
EN0J    |S| PCIe3 LP 4-port (10Gb FCoE & 1GbE) SR&RJ45
EN0K    |S| PCIe3 4-port (10Gb FCoE & 1GbE) SFP+Copper&RJ45
EN0L    |S| PCIe3 LP 4-port(10Gb FCoE & 1GbE) SFP+Copper&RJ45
EN0M    |S| PCIe3 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter
EN0N    |S| PCIe3 LP 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter
EN0S    |A| PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter
EN0T    |A| PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter
EN0U    |A| PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
EN0V    |A| PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
EN0W    |A| PCIe2 2-port 10/1GbE BaseT RJ45 Adapter
EN0X    |A| PCIe2 LP 2-port 10/1GbE BaseT RJ45 Adapter
EN0Y    |S| PCIe2 LP 8Gb 4-port Fibre Channel Adapter
EN28    |S| PCIe LP 2-Port Async EIA-232 Adapter



EPTH    |A| Horizontal PDU Mounting Hardware
EPTJ    |S| High Function 9xC19 PDU: Switched, Monitoring
EPTL    |S| High Function 9xC19 PDU 3-Phase: Switched, Monitoring
EPTN    |S| High Function 12xC13 PDU: Switched, Monitoring
EPTQ    |S| High Function 12xC13 PDU 3-Phase: Switched, Monitoring
EPX1    |A| 6-core 3.89 GHz POWER8 Processor Card
EPXD    |A| 10-core 3.42 GHz POWER8 Processor Card
EPXN    |A| 4-Core 3.02 GHz POWER8 Processor Card
EPY1    |A| One Processor Core Activation for #EPX1
EPYD    |A| One Processor Core Activation for #EPXD
EPYN    |A| One Processor Core Activation for #EPXN
EQ02    |S| Quanity 150 of #3452 SAS YO Cable 6m - HD 6Gb Adapter to
        |  |Enclosure
EQ03    |A| Quantity 150 of #3453 SAS YO Cable 10m - HD 6Gb Adapter to
        |  |Enclosure
EQ0C    |S| Quantity of 150 #ES0C
EQ0G    |S| Quantity 150 of #ES0G (775GB SSD SFF-2)
EQ0Q    |S| Quantity 150 of #ES0Q 387GB SFF-2 4k SSD (AIX/Linux)
EQ0S    |S| Quantity 150 of #ES0S 775GB SFF-2 4k SSD (AIX/Linux)
EQ19    |S| Quantity 150 of #ES19 (387GB SSD SFF-2)
EQ52    |S| Quantity 150 of #1752 (900GB SFF-2 disk)
EQ62    |A| Quantity 150 of #ES62 3.86-4.0 TB 7200 rpm 4k LFF-1 Disk
EQ64    |A| Quantity 150 of #ES64 7.72-8.0 TB 7200 rpm 4k LFF-1 Disk
EQ78    |S| Quantity 150 of #ES78 387GB SFF-2 SSD 5xx
EQ7E    |S| Quantity 150 of #ES7E 775GB SFF-2 SSD 5xx
EQ80    |S| Quantity 150 of #ES80 1.9TB SFF-2 SSD 4k
EQ85    |S| Quantity 150 of #ES85 387GB SFF-2 SSD 4k
EQ8C    |S| Quantity 150 of #ES8C 775GB SFF-2 SSD 4k
EQ8F    |S| Quantity 150 of #ES8F 1.55TB SFF-2 SSD 4k
EQ8Y    |S| Quantity 150 of #ES8Y 931GB SFF-2 SSD 4k
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EQ96   |S| Quantity 150 of ES96 1.86TB SFF-2 SSD 4k
EQD3   |A| Quantity 150 of #ESD3 (1.2TB 10k SFF-2)
EQDP   |D| Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/
       | |LINUX)
EQE7   |A| Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k
EQEZ   |S| Quantity 150 of #ESEZ (300GB SFF-2)
EQFP   |S| Quantity 150 of #ESFP (600GB SFF-2)
EPAA   |S| HVDC PDU - 90A 6xOutlet
EPAC   |S| Auto Selected HVDC Power Cord
EPAD   |S| 2.5 Meter HVDC Power Cord
EPNA   |A| 570 Processor Days Activation for #EPWA/ESYA
EPNB   |A| 570 Processor Days Activation for #EPWB/ESYB
EPNC   |A| 570 Processor Days Activation for #EPWC/ESYC
EPND   |A| 570 Processor Days Activation for #EPWD/ESYD
EPNE   |A| 570 Processor Days Activation for #EPWE/ESYE
EPNF   |A| 570 Processor Days Activation for #EPWF/ESYF
EPNG   |A| 570 Processor Days Activation for #EPWG/ESYG
EPNH   |A| 570 Processor Days Activation for #EPWH/ESYH
EPNJ   |A| 570 Processor Days Activation for #EPWJ/ESYJ
EPWA   |S| Small Linux Configuration --2 10-core 3.42GHz Processors,
       | |256 GB Memory, 146 GB HDD
EPWB   |S| Medium Linux Configuration - 2 10-core 3.42 GHz
       | |Processors, 512 GB Memory, 146 GB HDD
EPWC   |S| Large Linux Configuration -- 2 10-core 3.42 GHz
       | |Processors, 1 TB Memory, 146 GB HDD
EPWD   |S| Small AIX Configuration -- 2 10-core 3.42 GHz Processors,
       | |256 GB Memory, 146 GB HDD
EPWE   |S| Medium AIX Configuration - 2 10-core 3.42 GHz Processors,
       | |512 GB Memory, 146 GB HDD
EPWF   |S| Large AIX Configuration - 2 10--core 3.42 GHz Processors,
       | |1 TB Memory, 146 GB HDD
EPWG   |S| Small IBM i Configuration --2 10-core 3.42GHz Processors,
       | |256 GB Memory, 146 GB HDD
EPWH   |S| Medium IBM i Configuration - 2 10-core 3.42 GHz
       | |Processors, 512 GB Memory, 146 GB HDD
EPWJ   |S| Large IBM i Configuration -- 2 10-core 3.42 GHz
       | |Processors, 1 TB Memory, 146 GB HDD
EPXL   |A| 8-core 4.1 GHz POWER8 Processor Card
EPYL   |A| One Processor Core Activation for #EPXL
EQEV   |A| Quantity 150 of #ESEV (600GB 10k SFF-2)
EQF3   |A| Quantity 150 of #ESF3 (1.2TB 10k SFF-2)
EQFT   |A| Quantity 150 of #ESFT (1.8TB 10k SFF-2)
EQG5   |S| Quantity 150 of #ESG5 (387GB SAS 5xx)
EQGB   |S| Quantity 150 of #ESGB (387GB SAS 4k)
EQGF   |S| Quantity 150 of #ESGF (775GB SAS 5xx)
EQGK   |S| Quantity 150 of #ESGK (775GB SAS 4k)
EQGP   |S| Quantity 150 of #ESGP (1.55TB SAS 4k)
ER05   |S| 42U Slim Rack
ER2C   |S| Water Cooling of Processor Module
ER94   |S| Quantity 150 of ES94 387GB SAS 4k
ERB0   |S| Bulk Packaging Request ID
ERB1   |S| Bulk Packaging ID #1
ERB2   |S| Bulk Packaging ID #2
ERB3   |S| Bulk Packaging ID #3
ERB4   |S| Bulk Packaging ID #4
ERB5   |S| Bulk Packaging ID #5
ERB6   |S| Bulk Packaging ID #6
ERB7   |S| Bulk Packaging ID #7
ERB8   |S| Bulk Packaging ID #8
ERB9   |S| Bulk Packaging ID #9
ERBA   |S| Bulk Packaging ID #10
ERBB   |S| Bulk Packaging ID #11
ERBC   |S| Bulk Packaging ID #12
ERBD   |S| Bulk Packaging ID #13
ERBE   |S| Bulk Packaging ID #14
ERBF   |S| Bulk Packaging ID #15
ERBG   |S| Bulk Packaging ID #16
ERBH   |S| Bulk Packaging ID #17
ERBJ   |S| Bulk Packaging ID #18
ERBK   |S| Bulk Packaging ID #19
ERBL   |S| Bulk Packaging ID #20
ERBZ   |S| No Bulk Packaging Specify
ERF1   |S| RFID Tags for Servers, Compute Nodes, Chassis, Racks, and
       | |HMCs
ERG0   |A| Rear rack extension
ERGV   |S| Quantity 150 of ESGV 387GB SSD 4k
ERGZ   |S| Quantity 150 of ESGZ 775GB SSD 4k
ERHJ   |S| Quantity 150 of #ESHJ 931 GB SSD 4k SFF-2
ERHL   |S| Quantity 150 of #ESHL 1.86 TB SSD 4k SFF-2
ERJ0   |A| Quantity 150 of ESJ0 931GB SAS 4k
ERJ2   |A| Quantity 150 of ESJ2 1.86TB SAS 4k
ERJ4   |A| Quantity 150 of ESJ4 3.72TB SAS 4k
ERM8   |S| Quantity 150 of #ESM8 3.72 TB SSD 4k SFF-2
ERNA   |S| Quantity 150 of ESNA 775GB SSD 4k
ERNE   |S| Quantity 150 of ESNE 1.55TB SSD 4k
ES0C   |S| 387GB SFF-2 SSD for AIX/Linux with eMLC
ES0G   |S| 775GB SFF-2 SSD for AIX/Linux
ES0L   |S| 387GB SFF-3 SSD for AIX/Linux
ES0N   |S| 775GB SFF-3 SSD for AIX/Linux
ES0Q   |S| 387GB SFF-2 4K SSD for AIX/Linux
ES0S   |S| 775GB SFF-2 4k SSD for AIX/Linux
ES0U   |S| 387GB SFF-3 4k SSD AIX/Linux
ES0W   |S| 775GB SFF-3 4k SSD for AIX/Linux
ES0Y   |S| 177 GB 1.8" 4k SSD Read Intensive for AIX/Linux
ES0Z   |S| 177 GB 1.8" SSD Read Intensive for AIX/Linux (528 byte)
ES16   |S| 387GB 1.8" SSD for AIX/Linux
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ES19     |S| 387GB SFF-2 SSD for AIX/Linux
ES1C     |S| 387GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux
ES2V     |S| 387GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux
ES2X     |S| 775GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux
ES4K     |S| 775GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux
ES62     |A| 3.86-4.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/
         | |Linux)
ES64     |A| 7.72-8.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/
         | |Linux)
ES78     |S| 387GB SFF-2 SSD 5xx eMLC4 for AIX/Linux
ES7E     |S| 775GB SFF-2 SSD 5xx eMLC4 for AIX/Linux
ES7K     |S| 387GB SFF-3 SSD 5xx eMLC4 for AIX/Linux
ES7P     |S| 775GB SFF-3 SSD 5xx eMLC4 for AIX/Linux
ES80     |S| 1.9TB Read Intensive SAS 4k SFF-2 SSD for AIX/Linux
ES83     |S| 931GB  Mainstream  SAS 4k SFF-3 SSD for AIX/Linux
ES85     |S| 387GB SFF-2 SSD 4k eMLC4 for AIX/Linux
ES8C     |S| 775GB SFF-2 SSD 4k eMLC4 for AIX/Linux
ES8F     |S| 1.55TB SFF-2 SSD 4k eMLC4 for AIX/Linux
ES8J     |S| 1.9TB Read Intensive SAS 4k SFF-3 SSD for AIX/Linux
ES8N     |S| 387GB SFF-3 SSD 4k eMLC4 for AIX/Linux
ES8Q     |S| 775GB SFF-3 SSD 4k eMLC4 for AIX/Linux
ES8V     |S| 1.55TB SFF-3 SSD 4k eMLC4 for AIX/Linux
ES8Y     |S| 931GB  Mainstream  SAS 4k SFF-2 SSD for AIX/Linux
ES90     |S| 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ES92     |S| 1.86TB  Mainstream  SAS 4k SFF-3 SSD for AIX/Linux
ES94     |S| 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ES96     |S| 1.86TB  Mainstream  SAS 4k SFF-2 SSD for AIX/Linux
ESA3     |S| PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb CR
ESB0     |A| 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESB2     |A| 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESB4     |A| 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESB6     |A| 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESB8     |A| 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESBA     |A| 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESBE     |A| 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESBG     |A| 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESBJ     |A| 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESBL     |A| 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESC0     |A| S&H - No Charge
ESC5     |S| S&H-a
ESCB     |S| SAN-less PowerVM Compute Node Indicator
ESD3     |S| 1.2TB 10K RPM SAS SFF-2 Disk Drive (AIX/Linux)
ESD5     |A| 600GB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESD9     |S| 1.2TB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESDB     |A| 300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESDF     |S| 600GB 15k RPM SAS SFF-3 Disk Drive - 5xx Block
ESDP     |S| 600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block
ESDR     |S| 300GB 10k RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESDT     |S| 146GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESE1     |S| 3.72TB  Mainstream  SAS 4k SFF-3 SSD for AIX/Linux
ESE7     |S| 3.72TB  Mainstream  SAS 4k SFF-2 SSD for AIX/Linux
ESEV     |A| 600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ESEZ     |S| 300GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive
ESF3     |A| 1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ESF5     |A| 600GB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
ESF9     |A| 1.2TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
ESFB     |S| 300GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive
ESFF     |S| 600GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive
ESFP     |S| 600GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive
ESFT     |A| 1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ESFV     |A| 1.8TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096
ESG5     |S| 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESG9     |S| 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESGB     |S| 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESGD     |S| 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESGF     |S| 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESGH     |S| 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESGK     |S| 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESGM     |S| 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESGP     |S| 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESGR     |S| 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESGT     |S| 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESGV     |S| 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESGX     |S| 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux
ESGZ     |S| 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESHJ     |S| 931 GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESHL     |S| 1.86 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESHS     |S| 931 GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESHU     |S| 1.86 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJ0     |A| 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ2     |A| 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ4     |A| 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ8     |A| 931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJA     |A| 1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJC     |A| 3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESLA     |A| Specify AC Power Supply for EXP12SX/EXP24SX Storage
         | |Enclosure
ESLL     |A| EXP12SX SAS Storage Enclosure
ESLS     |A| EXP24SX SAS Storage Enclosure
ESM8     |S| 3.72 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESMQ     |S| 3.72 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESNA     |S| 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESNC     |S| 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESNE     |S| 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESNG     |S| 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux
ESNK     |A| 300GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/
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        | |Linux)
ESNM    |A|  300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/
        | |Linux)
ESNP    |A|  600GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/
        | |Linux)
ESNR    |A|  600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/
        | |Linux)
ESPM    |A|  Quantity 150 of #ESNM (300GB 15k SFF-2)
ESPR    |A|  Quantity 150 of #ESNR (600GB 15k SFF-2)
ESQ2    |A|  Quantity 150 of ESB2 387GB SAS 4k
ESQ6    |A|  Quantity 150 of ESB6 775GB SAS 4k
ESQA    |A|  Quantity 150 of ESBA 387GB SAS 4k
ESQG    |A|  Quantity 150 of ESBG 775GB SAS 4k
ESQL    |A|  Quantity 150 of ESBL 1.55TB SAS 4k
EU01    |A|  1TB Removable Disk Drive Cartridge
EU04    |S|  RDX USB External Docking Station for Removable Disk
        | |Cartridge
EU08    |S|  RDX 320 GB Removable Disk Drive
EU15    |S|  1.5TB Removable Disk Drive Cartridge
EU19    |A|  Cable Ties & Labels




EU2B    |S|  BLU Acceleration Solution Edition Indicator
EU2T    |A|  2TB Removable Disk Drive Cartridge (RDX)




EUC0    |S|  Solution Specify - Reserved
EUC1    |S|  Solution Specify - Reserved
EUC2    |S|  Solution Specify - Reserved
EUC3    |S|  Solution Specify - Reserved
EUC6    |A|  Core Use HW Feature
EUC7    |A|  Core Use HW Feature 10X
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Feature descriptions

Note: Not all of the following features are available in all countries. Check with your country representative for specific feature availability.
The following is a list of all feature codes in numeric order for the IBM Power Systems 8284 machine type.

Attributes, as defined in the following feature descriptions, state the interaction of requirements among features.

Minimums and maximums are the absolute limits for a single feature without regard to interaction with other features. The maximum valid quantity for MES orders may be different than for initial orders. The maximums listed below refer to the largest quantity of these two possibilities.

The order type defines if a feature is orderable only on initial orders, only on MES orders, on both initial and MES orders, or if a feature is supported on a model due to a model conversion. Supported features cannot be ordered on the converted model, only left on or removed from the converted model.

(#0010) - One CSC Billing Unit

One Billing Unit used by the Customer Solution Center.

- Attributes provided: One CSC Billing Unit
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#0011) - Ten CSC Billing Units

Ten Billing Units used by the Customer Solutions Center.

- Attributes provided: Ten CSC Billing Units
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 100 (Initial order maximum: 100)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#0265) - AIX Partition Specify

This feature indicates customers intend to create a partition on the system that will use the AIX operating system. This feature should be included once for each intended AIX partition. This feature is an indicator and does not deliver parts, software, or services.

- Attributes provided: None
- Attributes required: Customers intend to create a partition on the system that will run the AIX operating system.
- Minimum required: 0
- Maximum allowed: 480 (Initial order maximum: 250)
- OS level required:
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0266) - Linux Partition Specify

This feature indicates customers intend to create a partition on the system that will use the Linux operating system. This feature should be included once for each intended Linux partition. This feature is an indicator and does not deliver parts, software, or services.

- Attributes provided: None
- Attributes required: Customers intend to create a partition on the system that will run the Linux operating system.
- Minimum required: 0
- Maximum allowed: 480 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0267) - IBM i Operating System Partition Specify

This feature indicates customers intend to create a partition on the system that will use the IBM i operating system. This feature should be included once for each intended IBM i partition. This feature is an indicator and does not deliver parts, software, or services.

- Attributes provided: None
- Attributes required: Customers intend to create a partition on the system that will run the IBM i operating system.
- Minimum required: 0
- Maximum allowed: 480 (Initial order maximum: 250)
- OS level required:
  - IBM i 7.1 or later
  - IBM i 7.2 or later
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0348) - V.24/EIA232 6.1m (20-Ft) PCI Cable

This feature provides a 20-foot WAN PCI cable that supports a V.24 or a EIA232 electrical connection interface.

- Attributes provided: N/A
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0353) - V.35 6.1m (20-Ft) PCI Cable

This feature provides a 20-foot WAN PCI cable that supports a V.35 electrical connection interface.

- Attributes provided: N/A
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0359) - X.21 6.1m (20-Ft) PCI Cable

This feature provides a 20-foot WAN PCI cable that supports a X.21 electrical connection interface.

- Attributes provided: N/A
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0444) - CBU Specify

(No longer available as of February 28, 2019)

This specify code indicates this system has been properly registered as a Capacity BackUp system and has, through that registration been authorized to temporarily receive IBM i Operating System License Entitlements and either 5250 Processor Enablement entitlements or IBM i user entitlements, from a primary system under the conditions specified at the time the system was registered. This feature is an indicator only, authorization to use this system as a backup is obtained only by registering the system with IBM on the CBU website at: www.ibm.com/systems/power/hardware/cbu

- Attributes provided: Indicates the system has been registered for use as a CBU system for IBM i License entitlement purposes.
- Attributes required: # 2145 Primary OS - IBM i or #0267 IBM i Operating System Partition Specify
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#0456) - Customer Specified Placement

(No longer available as of February 28, 2019)

1. Requests that IBM deliver the system to the customer according to the slot in drawer hardware placement defined by the account team.
2. Eliminates the need to have these parts relocated in the customers environment as may happen if the order is placed without this feature code.
3. Client placement specifications are collected using the System Planning Tool (SPT) and processed through the marketing configurator. (Use of the SPT is not required).
4. Requires account team to submit the output of the marketing configurator into IBM manufacturing via the CSP website http://www.ibm.com/eserver/power/csp (US Business Partners and Distributors can bypass this step.)
5. Requires account team to assure that the marketing configurator output submitted reflects the actual order placed.

- Attributes provided: I/O component placement
- Attributes required: Marketing Configurator output submitted to the CSP website. (US Business Partners and Distributors can bypass this step.)
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#0465) - SSD Placement Indicator - 5887, EL1S

(No longer available as of February 28, 2019)

This is an IBM internal automatic generated SSD specify indicator for placement and it is not selectable.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#0551) - 19 inch, 1.8 meter high rack

Provides a 19 inch, 1.8 meter high rack with 36 EIA units of total space for installing rack mounted CECs and/or expansion units. Every 0551 rack is equipped with a standard rear door and (2x) side covers. #0551 racks, however, do not come equipped with a front door or trim kit. One of the following front door or trim kit features is therefore required with every #0551:

- #6068 - Optional Front Door for 1.8m Rack
- #6263 - 1.8m Rack Trim Kit
- #6248 - 1.8m Rack Acoustic Front and Rear Doors

The following features are also orderable on the #0551:

- #0599 - Rack Filler Panel Kit
- #6580 - Optional Rack Security Kit
- #6586 - Modem Tray

The #0551 can support up to eight PDUs, four mounted vertically and four mounted horizontally. Each PDU mounted horizontally takes up 1 EIA of rack space. The following PDUs are supported:

- #7188 - Power Distribution Unit (12, C-13 sockets)
- #7109 - Power Distribution Unit (12, C-13 sockets)
- #7196 - Power Distribution Unit (6, C-19 sockets)
- #EPTJ - Power Distribution Unit (9, C-19 sockets)
- #EPTL - Power Distribution Unit (9, C-19 sockets)
- #EPTN-Power Distribution Unit (12, C-13 sockets)
- #EPTQ-Power Distribution Unit (12, C-13 sockets)
- #EPAA - HVDC Power Distribution Unit (6, Rong Feng sockets)
- Attributes provided: 19 inch, 1.8M, 36 EIA Rack with standard rear door and (2x) standard side covers.
- Attributes required: #6068 or #6248 or #6263.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#0553) - 19 inch, 2.0 meter high rack

Provides a 19-inch, 2.0 meter high rack with 42 EIA units of total space for installing rack mounted CECs and/or expansion units. Every 0553 rack is equipped with a standard rear door and (2x) side covers. #0553 racks, however, do not come equipped with a front door or trim kit. One of the following front door or trim kit features is therefore required with every #0553:

- #6069 - Optional Front Door for 2.0m Rack
- #6247 - 2.0m Rack Trim Kit (w/d 5/28/2010)
- #6272 - 2.0m Rack Trim Kit
- #6249 - 2.0m Rack Front and Rear Acoustic Doors
- #EC08 - Slim Front Acoustic Door

The following optional features on the #0553 rack:

- #EC07-Slim Rear Acoustic Door
- #6238_ High-End Appearance Side Covers (Note: #6238 is limited to high-end servers).
- #ERG0 - Rear rack extension
- #6580 - Rack Security Kit
- #0599 - Rack Filler Panel Kit
- #6586 - Modem Tray

The #0553 can support up to nine power distribution units (PDU), four mounted vertically and five mounted horizontally. Each PDU mounted horizontally takes up 1 EIA of rack space. The following PDUs are supported:

- #7188 - Power Distribution Unit (12, C13 sockets)
- #7109 - Power Distribution Unit (12, C13 sockets)
- #7196 - Power Distribution Unit (6, C19 sockets)
- #EPTJ - Power Distribution Unit (9, C19 sockets)
- #EPTL - Power Distribution Unit (9, C19 sockets)
- #EPTN-Power Distribution Unit (12, C13 sockets)
- #EPTQ-Power Distribution Unit (12, C13 sockets)
- #EPAA - HVDC Power Distribution Unit (6, Rong Feng sockets)

The manufacturing practice and recommended configuration of the rack is:

- Reserve 2U Rack Space at Bottom of Rack
- Reserve 1U rack horizonal space - 1 EIA. Supports horizontally mounted PDU if needed.
- Attributes provided: 19 inch, 2.0M, 42 EIA Rack, standard rear door and standard side covers.
- Attributes required: #6069 or #6247 or #6272 or #6249 or #EC08.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#0567) - IBM i 7.1 Specify Code

(No longer available as of October 19, 2018)

This feature is used to indicate the correct level of code when IBM i is specified.

- Attributes provided: IBM i 7.1 indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 480 (Initial order maximum: 250)
- OS level required:
  - IBM i 7.1
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0599) - Rack Filler Panel Kit

Provides rack filler panels for IBM 19-inch racks. The #0599 provides three 1-EIA -unit filler panels and one 3-EIA-unit filler panel. These are snap-on panels.

- Attributes provided: Snap on rack filler panels
- Attributes required: 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0709) - Flexible Thermal Settings for NEBS Applications

(No longer available as of February 28, 2019)

Ordering this feature will deliver a system that will enable customers to reset the thermal tolerances of the system to the higher limits specified by NEBS Level 3 (Network Equipment Building System) compliant specifications. This feature is also available for systems currently installed via an MES order.

- Attributes provided: NEBS compliant system
- Attributes required: Supported system
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#0712) - Power Cloud Integrated Solution Indicator For Order Routing

(No longer available as of February 28, 2019)

A manufacturing code used to identify when a Machine Type/Model is part of a Power Cloud solution or configuration.

- Attributes provided: Manufacturing Routing Code
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#0719) - Load Source Not in CEC

This specify feature indicates to the IBM Marketing configurator tools and IBM manufacturing that disk drives will not be placed in the system unit, but will be placed in I/O drawers or in external SAN attached disk.

- Attributes provided: System unit(s) are shipped with no disk units placed inside.
- Attributes required: Alternate load source specified
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0728) - Specify #5887 or #EL1S Load Source placement

(No longer available as of December 31, 2020)

#0728 Specifies that Load/Source DASD are placed in an EXP24S SFF Gen2-bay Drawer.

- Attributes provided: External load source placement specify
- Attributes required: DASD Slot 1 open in drawer
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0837) - SAN Load Source Specify

Indicates that a SAN drive is being used as the Load Source for the operating system.

- Attributes provided: SAN load source placement specify
- Attributes required: Fiber Channel adapter
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1025) - Modem Cable - US/Canada and General Use

(No longer available as of December 31, 2020)

Modem cable, use with #2893, 6808 and 6833 or similar modem adapters. Maximum of two per adapter. Select this cable for use with your modem if there is not another cable feature that is identified as specific to your country.

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1107) - USB 500 GB Removable Disk Drive

Provides an RDX disk drive in a rugged cartridge to be used in an RDX Internal and External docking station such as the #1103, #1104, #1123, #EU03, #EU04, #EU23 or #EU07. 500 GB is uncompressed. With typical 2X compression, capacity would be 1000 GB. Compression/ decompression is provided by the operating system, not the drive itself. Feature 1107 is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 500 GB RDX rugged disk/cartridge
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - For IBM i, see docking station for OS requirements.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#1140) - Custom Service Specify, Rochester Minn, USA

Having #1140 on the order, will cause the order to be routed to Rochester and the machine to be internally routed to the CSC build area in building 114 (Rochester).

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1752) - 900GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)

900GB SFF 10k rpm SAS drive in Gen-2 carrier. Supported in SFF SAS bays such as provided in #5887 EXP24S Gen2 I/O drawer. Disk is formatted for 512 byte sectors.

The drive can be reformatted to 528 byte sectors and then used by IBM i/AIX/Linux/VIOS

Limitation: Cannot be used in #5802/5803 I/O drawers or in CEC SFF bays due to physical difference in Gen1 and Gen2 carriers.

- Attributes provided: 900GB of Disk Storage mounted in a Gen2 carrier
- Attributes required: one SFF (SFF-2) SAS GEN2 drive bay
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1818) - Quantity 150 of #1964

This feature ships a quantity of 150 #1964 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: see feature #1964
- Attributes required: see feature #1964
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1866) - Quantity 150 of #1917

(No Longer Available as of July 8, 2016)

This feature ships a quantity of 150 #1917 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: see feature #1917
- Attributes required: see feature #1917
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1869) - Quantity 150 of #1925

(No Longer Available as of July 8, 2016)

This feature ships a quantity of 150 #1925 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: see feature #1925
- Attributes required: see feature #1925
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1917) - 146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)

(No Longer Available as of July 8, 2016)

146GB SFF 15k RPM SAS SFF-2 Disk Drive (AIX/Linux) mounted in Gen-2 carrier and supported in SFF SAS bays such as provided in #5887 EXP24S Gen2 I/O drawer. Disk is formatted for 512 byte sectors.

Limitation: Cannot be used in #5802/5803 I/O drawers due to physical difference in Gen1 and Gen2 carriers.

- Attributes provided: 146GB of Disk Storage mounted in a Gen-2 carrier
- Attributes required: One SFF SAS disk drive bay slot
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1925) - 300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)

(No Longer Available as of July 8, 2016)

300GB SFF 10k RPM SAS SFF-2 Disk Drive (AIX/Linux). Supported in SFF SAS bays such as provided in #5887 EXP24S Gen2 I/O drawer. Disk is formatted for 512 byte sectors.

Limitation: Cannot be used in #5802/5803 I/O drawers or in CEC due to physical difference in Gen1 and Gen2 carriers.

- Attributes provided: 300GB SFF disk drive mounted in a carrier
- Attributes required: One SFF Gen-2 bay
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1929) - Quantity 150 of #1953

This feature ships a quantity of 150 #1953 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: see feature #1953
- Attributes required: see feature #1953
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1953) - 300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)

300 GB SFF 15k RPM SAS disk drive mounted in a Gen-2 carrier and supported in SFF SAS bay such as used in the #5887 EXP24S I/O drawer or #ESLS EXP24SX I/O drawer. Disk can be formatted for either 512 bytes or 528 byte sectors and is thus called having 5xx drive sectors. 528 byte sectors provide additional protection. IBM Manufacturing will ship pre-formatted with 528 or with 512 byte sectors. Selection of the formatting is selected by IBM Manufacturing based on manufacturing rules, but the client may change at their location. In the EPX24SX IBM Manufacturing will ship using 528 byte sectors. Capacity is 300 GB with 512 byte formatting and is 283 GB with 528 byte sector. CCIN is 19B1.

Limitations: physical difference in carriers prevent this drive from being used in SFF-1 bays such as used in the #5802/5803 I/O drawer or in SFF-3 bays such as used in POWER8 system units.

- Attributes provided: 300 GB/283 GB of SFF (2.5-inch) SAS disk storage mounted in Gen-2 carrier.
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1964) - 600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)

600 GB SFF 10k RPM SAS disk drive mounted in a Gen-2 carrier and supported in SFF SAS bay such as used in the #5887 EXP24S I/O drawer or #ESLS EXP24SX I/O drawer. Disk can be formatted for either 512 bytes or 528 byte sectors and is thus called having 5xx drive sectors. 528 byte sectors provide additional protection. IBM Manufacturing will ship pre-formatted with 528 or with 512 byte sectors. Selection of the formatting is selected by IBM Manufacturing based on manufacturing rules, but the client may change at their location. In the EPX24SX IBM Manufacturing will ship using 528 byte sectors. Capacity is 600 GB with 512 byte formatting and is 571 GB with 528 byte sector.

Limitations: physical difference in carriers prevent this drive from being used in SFF-1 bays such as used in the #5802/5803 I/O drawer or in SFF-3 bays such as used in POWER8 system units.

- Attributes provided: 600GB/571GB of SFF (2.5-inch) SAS disk storage mounted in Gen-2 carrier.
- Attributes required: one SFF-2 drive bay.
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2146) - Primary OS - AIX

Indicates clients intend to use the AIX operating system on the primary system partition. This feature is used as a Manufacturing Routing indicator and does not deliver parts, software or services.

- Attributes provided: None
- Attributes required: Indicates clients intend to use the AIX operating system on the primary system partition.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#2147) - Primary OS - Linux

Indicates clients intend to use the Linux operating system on the primary system partition. This feature is used as a Manufacturing Routing indicator and does not deliver parts, software or services.

- Attributes provided: None
- Attributes required: Indicates clients intend to use the Linux operating system on the primary system partition.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2148) - IBM i with VIOS Only System Indicator

This feature indicates that IBM i is supported on the system via VIOS only.

- Attributes provided: None
- Attributes required: Indicates clients intend to use the IBM i operating system on the system.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
  - IBM i 7.1 or later
  - IBM i 7.2 or later
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Requires VIOS.

(#2319) - Factory Deconfiguration of 1-core

(No longer available as of February 28, 2019)

Factory deconfiguration of 1 processor core to assist with optimization of software licensing. The maximum number of this feature that can be ordered is one less than the number of cores on the system, e.g. 7 for an 8-core system and 15 for a 16-core system.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 19 (Initial order maximum: 19)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#2456) - 2M LC-SC 50 Micron Fiber Converter Cable

The 50 micron fiber cable is used to convert from LC type to SC type connectors. The 2 meter cable has a male LC type connector on one end and a female SC type connector on the other.

- Attributes provided: Cable with (1X) LC type plug and (1X) SC type receptacle
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2459) - 2M LC-SC 62.5 Micron Fiber Converter Cable

The 62.5 micron fiber cable is used to convert from LC type to SC type connectors. The 2 meter cable has a male LC type connector on one end and a female SC type connector on the other.

- Attributes provided: Cable with (1X) LC type plug and (1X) SC type receptacle
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2934) - 3M Asynchronous Terminal/Printer Cable EIA-232

The Asynchronous Printer/Terminal Cable is used for attaching printers, plotters, and terminals that support the EIA-232 standard to any asynchronous adapter. This cable is the equivalent of the combination of FC 2936 (modem cable) and FC 2937 (printer/terminal interposer) and replaces this method of printer/terminal attachment.

This cable is 3m (9.8 feet) long, uses DB25 connectors and is supported on all RS/6000 systems using any asynchronous ports.

- Attributes provided: EIA232 device attachment capability
- Attributes required: Any Asynchronous port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2936) - Asynchronous Cable EIA-232/V.24 3M

Used to attach a modem to the standard I/O ports with the 10-pin to 25-pin converter cable (#3925), 8-port Cable Assembly, 16-Port Cable Assembly. The cable is 3 meters (9.8 feet) in length.

- Attributes provided: Modem attachment to async or serial port
- Attributes required: Async or serial port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3124) - Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M

This 3.7 meter cable is available to provide a null-modem connection between the serial ports of two system drawers that are mounted within the same rack. The cable provides a DB25 female connector at each end.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3125) - Serial-to-Serial Port Cable for Rack/Rack- 8M

This 8 meter cable is available to provide a null-modem connection between the serial ports of two system drawers that are mounted in separate racks. The cable provides a DB25 female connector at each end.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3287) - 1m, (3.3-ft) IB 40G Copper Cable QSFP/QSFP

This 1 meter (3.3 foot) copper cable provides a high bandwidth connection up to 40 Gb/s (Quad Data Rate). Both ends of the cable have a QFSP connector. The cable connectors can be described as QSFP+/QSFP+ as well as QSFP/QSFP. Usage examples include a) connecting a PCIe2 InfiniBand QDR Adapter to a QDR IB switch or b) connecting two IBM Rack Switches together using QSFP+ ports.

- Attributes provided: 1 meter Quad Data Rate InfiniBand Copper Cable, QSFP/QSFP
- Attributes required: QDR InfiniBand QSFP port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3288) - 3m, (9.8-ft.) IB 40G Copper Cable QSFP/QSFP

This 3 meter (9.8 foot) copper cable provides a high bandwidth connection up to 40 Gb/s (Quad Data Rate). Both ends of the cable have a QFSP connector. The cable connectors can be described as QSFP+/QSFP+ as well as QSFP/QSFP. Usage examples include a) connecting a PCIe2 InfiniBand QDR Adapter to a QDR IB switch or b) connecting two IBM Rack Switches together using QSFP+ ports.

- Attributes provided: 3 meter Quad Data Rate InfiniBand Copper Cable, QSFP/QSFP
- Attributes required: QDR InfiniBand QSFP port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3289) - 5m QDR IB/E'Net Copper Cable QSFP/QSFP

(No longer available as of December 31, 2020)

This 5 meter Quad Data Rate (40Gb/s) InfinBand copper cable is used to connect the QDR Host Channel Adapter to QDR InfiniBand Switches.

- Attributes provided: 5 meter Quad Data Rate InfiniBand Copper Cable, QSFP/QSFP
- Attributes required: QDR InfiniBand port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3290) - 10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP

(No longer available as of December 31, 2020)

This 10 meter Quad Data Rate (40Gb/s) InfinBand optical cable is used to connect the QDR Host Channel Adapter to QDR InfiniBand Switches. It can also be used for QDR InfiniBand switch-to-switch applications.

- Attributes provided: 10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP
- Attributes required: InfiniBand switch #3699, or follow-on
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3293) - 30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP

(No longer available as of December 31, 2020)

This 30 meter Quad Data Rate (40Gb/s) InfinBand optical cable is used to connect the QDR Host Channel Adapter to QDR InfiniBand Switches. It can also be used for QDR InfiniBand switch-to-switch applications.

- Attributes provided: 30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP
- Attributes required: InfiniBand switch #3699, or follow-on
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3450) - SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This 1.5 meter SAS cable connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3451) - SAS YO Cable 3m - HD 6Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This 6 meter SAS cable connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3452) - SAS YO Cable 6m - HD 6Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This 6 meter SAS cable connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3453) - SAS YO Cable 10m - HD 6Gb Adapter to Enclosure

This 10 meter SAS cable connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3454) - SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure

This 3 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) connector and two Mini SAS connectors. The Mini-SAS HD connectors attaches to two SAS adapters such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

- Attributes provided: connection between two SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3455) - SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure

This 6 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) connector and two Mini SAS connectors. The Mini-SAS HD connectors attaches to two SAS adapters such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

- Attributes provided: connection between two SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3456) - SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure

(No longer available as of December 31, 2020)

This 10 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) connector and two Mini SAS connectors. The Mini-SAS HD connectors attaches to two SAS adapters such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

- Attributes provided: connection between two SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3457) - SAS YO Cable 15m - HD 3Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This 15 meter SAS cable connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter or #ESA1/ESA2 PCIe2 RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 3Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3458) - SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure

This 15 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) connector and two Mini SAS connectors. The Mini-SAS HD connectors attaches to two SAS adapters such as the #5913 1.8GB RAID SAS Adapter or #ESA1/ESA2 PCIe2 RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 3Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

- Attributes provided: connection between two SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3632) - Widescreen LCD Monitor

(No Longer Available as of August 08, 2017)

The Widescreen LCD Monitor has the following general characteristics:

- Black color
- Minimum 533mm (21 inch) diagonal LCD digital screen
- Maximum native resolution of 1680 x 1050 (widescreen format 1.6:1)
- Can display traditional resolutions (1024x768 and 1280x1024) without stretching
- Tilt, swivel, and height stand adjustments
- Industry standard analog input (15-pin D) and a DVI to VGA converter
- Attributes provided: Color Flat-panel Monitor
- Attributes required: Graphics Adapter
- Attributes provided: Color Flat-panel Monitor
- Attributes required: Graphics Adapter
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: Not supported in Mainland China.

(#3661) SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:

This SAS cable (X) connects a SAS disk drawer to two SAS controller adapters. This cable supports dual controller/dual path attach between two SAS controller adapters and the SAS disk drawer. The SAS controller adapters can be in the same or in different host systems. This cable has four Mini SAS 4x plug connectors. Two of the Mini SAS 4x plug connectors attach to the adapters and are keyed as END DEVICES. Two of the Mini SAS 4x plug connectors attach to the SAS disk drawer and are keyed for ENCLOSURE DOWN Arrow. All of the connectors are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 3 meters long, choose the SAS (X) cable length that matches the distance between the adapters and the SAS disk drawer. The adapter legs of this cable are each 2.5 meters long.

- Attributes provided: Connection between two SAS controller adapters and a SAS disk drawer
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3662) SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M

This SAS cable (X) connects a SAS disk drawer to two SAS controller adapters. This cable supports dual controller/dual path attach between two SAS controller adapters and the SAS disk drawer. The SAS controller adapters can be in the same or in different host systems. This cable has four Mini SAS 4x plug connectors. Two of the Mini SAS 4x plug connectors attach to the adapters and are keyed as END DEVICES. Two of the Mini SAS 4x plug connectors attach to the SAS disk drawer and are keyed for ENCLOSURE DOWN Arrow. All of the connectors are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 6 meters long, choose the SAS (X) cable length that matches the distance between the adapters and the SAS disk drawer. The adapter legs of this cable are each 5.5 meters long.

- Attributes provided: Connection between two SAS controller adapters and a SAS disk drawer
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3663) SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M

(No longer available as of December 31, 2020)

This SAS cable (X) connects a SAS disk drawer to two SAS controller adapters. This cable supports dual controller/dual path attach between two SAS controller adapters and the SAS disk drawer. The SAS controller adapters can be in the same or in different host systems. This cable has four Mini SAS 4x plug connectors. Two of the Mini SAS 4x plug connectors attach to the adapters and are keyed as END DEVICES. Two of the Mini SAS 4x plug connectors attach to the SAS disk drawer and are keyed for ENCLOSURE DOWN Arrow. All of the connectors are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 15 meters long, choose the SAS (X) cable length that matches the distance between the adapters and the SAS disk drawer. The adapter legs of this cable are each 14.5 meters long.

- Attributes provided: Connection between two SAS controller adapters and a SAS disk drawer
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3681) - 3M SAS CABLE, ADPTR TO ADPTR (AA)

(No longer available as of December 31, 2020)

The dedicated 2:6 cable connects between the dedicated top port on #5904, #5906 or #5908 for a SAS RAID Dual controller configuration providing (higher performance) path for all the dual controller communication including the mirroring of Write Cache and Parity update footprints between the adapters.

If the cable fails or is disconnected for some reason, then the "traditional" dual controller communication path via the SAS fabric (i.e. through the common disk expanders) is used for the adapter-to-adapter communication (mirror Write Cache, Parity Update footprints, etc...). This cable provides higher performance and redundancy. The cable is required for dual SAS RAID configuration. It is not required nor used for a single SAS RAID adapter (standalone) configuration.

- Attributes provided: Higher performance path for all the dual controller communication including the mirroring of Write Cache and Parity update footprints between the adapters.
- Attributes required: Two of any combination of the following SAS RAID adapters #5904, #5906 or 5908.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3684) - SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M

This adapter-to-enclosure (AE) SAS cable most commonly connects a SAS controller to a media expansion drawer.

For AIX and Linux, this cable can also be used to connect two SAS adapters to a SAS disk drawer in a specific dual controller HA two system JBOD configuration using two #5912 controllers. Single controller/single path connections are supported with this cable only for this specific JBOD configuration, and, as such, two #5912 SAS controllers and two (AE style) cables are required for a supported configuration. The two SAS adapters must be in different host systems/partitions.

This cable has one mini SAS 4X plug connector on the adapter end wired in 4x mode and one mini SAS 4X plug connector on the drawer end, wired in 4x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is three meters long. Select the SAS (AE) cable length that best matches the distance between the host system and the remote SAS drawer being attached.

- Attributes provided: Connection between a SAS controller and a media expansion drawer or for AIX and Linux connection between #5912 SAS controller and a SAS disk drawer in a dual controller HA two system JBOD configuration only
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3685) - SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M

(No longer available as of December 31, 2020)

This adapter-to-enclosure (AE) SAS cable most commonly connects a SAS controller to a media expansion drawer.

For the AIX and Linux operating systems, this cable can also be used to connect two SAS adapters to a SAS disk drawer in a specific dual controller HA two system JBOD configuration using two #5912 controllers. Single controller/single path connections are supported with this cable only for this specific JBOD configuration, and, as such, two #5912 SAS controllers and two (AE style) cables are required for a supported configuration. The two SAS adapters must be in different host systems/partitions.

This cable has one mini SAS 4X plug connector on the adapter end wired in 4x mode and one mini SAS 4X plug connector on the drawer end, wired in 4x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is three meters long. Select the SAS (AE) cable length that best matches the distance between the host system and the remote SAS drawer being attached.

- Attributes provided: Connection between a SAS controller and a media expansion drawer or for AIX and Linux connection between #5912 SAS controller and a SAS disk drawer in a dual controller HA two system JBOD configuration only
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3691) SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5M

This SAS cable (YO) connects a remote SAS drawer to a SAS controller adapter. This cable supports single controller/dual path attach between the SAS controller adapter and the SAS disk drawer. This cable has one Mini SAS 4X plug connector on the adapter end keyed for an END DEVICE, wired in 4x mode and two Mini SAS 4X plug connectors on the drawer end keyed for ENCLOSURE DOWN Arrow, both are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 1.5 meters long, choose the SAS (YO) cable length that matches the distance between the adapter and the SAS disk drawer.

- Attributes provided: connection between SAS controller adapter and a SAS disk drawer
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3692) SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3M

This SAS cable (YO) connects a remote SAS drawer to a SAS controller adapter. This cable supports single controller/dual path attach between the SAS controller adapter and the SAS disk drawer. This cable has one Mini SAS 4X plug connector on the adapter end keyed for an END DEVICE, wired in 4x mode and two Mini SAS 4X plug connectors on the drawer end keyed for ENCLOSURE DOWN Arrow, both are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 3 meters long, choose the SAS (YO) cable length that matches the distance between the adapter and the SAS disk drawer.

- Attributes provided: connection between SAS controller adapter and a SAS disk drawer
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3693) SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6M

This SAS cable (YO) connects a remote SAS drawer to a SAS controller adapter. This cable supports single controller/dual path attach between the SAS controller adapter and the SAS disk drawer. This cable has one Mini SAS 4X plug connector on the adapter end keyed for an END DEVICE, wired in 4x mode and two Mini SAS 4X plug connectors on the drawer end keyed for ENCLOSURE DOWN Arrow, both are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 6 meters long, choose the SAS (YO) cable length that matches the distance between the adapter and the SAS disk drawer.

- Attributes provided: connection between SAS controller adapter and a SAS disk drawer
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3694) SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15M

(No longer available as of December 31, 2020)

This SAS cable (YO) connects a remote SAS drawer to a SAS controller adapter. This cable supports single controller/dual path attach between the SAS controller adapter and the SAS disk drawer. This cable has one Mini SAS 4X plug connector on the adapter end keyed for an END DEVICE, wired in 4x mode and two Mini SAS 4X plug connectors on the drawer end keyed for ENCLOSURE DOWN Arrow, both are wired in 2x mode. Follow the directions on the connector labels when attaching the connectors on this cable. This cable is 15 meters long, choose the SAS (YO) cable length that matches the distance between the adapter and the SAS disk drawer.

- Attributes provided: connection between SAS controller adapter and a SAS disk drawer
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3925) - 0.3M Serial Port Converter Cable, 9-Pin to 25-Pin

This cable converts the 9-pin serial port on the system to a 25-pin serial port which allows the user to attach 25-pin serial devices to the system.

- Attributes provided: 9-Pin to 25-Pin connectivity
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3927) - Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M

This 3.7 meter 9 pin to 9 pin Null modem Serial cable allows two EIA-232 communications ports to exchange data with one another without going through a modem.

- Attributes provided: 9 pin female connector at each end of the cable
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3928) - Serial Port Null Modem Cable, 9-pin to 9-pin, 10M

This 10 meter 9 pin to 9 pin Null Modem Serial cable allows two EIA-232 communications ports to exchange data with one another without going through a modem.

- Attributes provided: 9 pin female connector at each end of the cable
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3930) - System Serial Port Converter Cable

This cable is used to connect the System port/UPS Conversion Cable (#1827) to the CEC serial port. Also used to connect an ASCII terminal or modem to the serial port which is physically an RJ45 connection on the Power 710/720/730/740 and Power S824/S822/S814/ S822L/S812L systems unit .

- Attributes provided: Attachment of #1827 to CEC serial port; attachment of ASCII terminal or modem to the serial port.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#4242) 1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)

(No Longer Available as of March 31, 2018)

This cable is required to connect displays with a 15-pin "D" shell connector to the appropriate accelerator connector when it is farther away than the attached monitor cable can reach. Rack mounted systems are likely candidates for this extender cable.

- Attributes provided: 6-foot extension cable
- Attributes required: Supported monitor and adapter with a 15-pin "D" shell connector.
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#4256) - Extender Cable - USB Keyboards, 1.8M

This feature provides a 1.8M extension cable for use with USB keyboards.

- Attributes provided: 1.8M Extension Cable
- Attributes required: USB Keyboard
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- Return parts MES: No

(#4276) - VGA to DVI Connection Converter

This feature is a plug converter that will allow a Video device with a 15 pin D-shell VGA cable plug (such as a KVM switch) to connect to a graphics adapter with a 28 pin D-shell DVI receptacle connector. This device has both a 28 pin D-Shell DVI plug and a 15 pin D-shell VGA receptacle.

- Attributes provided: VGA to DVI connection converter
- Attributes required: VGA device and graphics adapter with DVI connector.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#4648) - Rack Integration Services: BP only

#4648 is a prerequisite for business partner integration: #4651-4666.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4649) - Rack Integration Services

(No longer available as of February 28, 2019)

#4649 is a prerequisite for #4651-4666.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

One and only one rack indicator feature is required onall orders (#4650 to #4666).

(#4650) - Rack Indicator- Not Factory Integrated

(No longer available as of February 28, 2019)

This indicator is used to specify that the rack mountable device in this initial order should not be merged into a rack within IBM Manufacturing. If a device with 4650 is ordered with a rack, the device will not be factory integrated in the ordered rack and will ship uninstalled in the rack.
Note: This "no additional charge" feature will be placed on an initial order for a rack mountable device by the Configuration Tool when the order does not ship from IBM Manufacturing in a Rack.

A rack integration indicator is required on all 19" Rack mountable device initial orders. One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

- Attributes provided: System will not be shipped in a rack.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4651) - Rack Indicator, Rack #1

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the first rack for a multi rack order, or the only rack for a single rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #1.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack Integration/ Rack Specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4652) - Rack Indicator, Rack #2

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the second rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #2 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack Integration/Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4653) - Rack Indicator, Rack #3

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the third rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #3 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4654) - Rack Indicator, Rack #4

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the fourth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #4 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4655) - Rack Indicator, Rack #5

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the fifth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #5 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4656) - Rack Indicator, Rack #6

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the sixth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #6 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4657) - Rack Indicator, Rack #7

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the seventh rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #7 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4658) - Rack Indicator, Rack #8

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the eighth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #8 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4659) - Rack Indicator, Rack #9

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the ninth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #9 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4660) - Rack Indicator, Rack #10

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the tenth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #10 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4661) - Rack Indicator, Rack #11

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the eleventh rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #11 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4662) - Rack Indicator, Rack #12

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the twelfth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #12 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4663) - Rack Indicator, Rack #13

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the thirteenth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #13 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4664) - Rack Indicator, Rack #14

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the fourteenth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #14 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4665) - Rack Indicator, Rack #15

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the fifteenth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #15 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4666) - Rack Indicator, Rack #16

(No longer available as of February 28, 2019)

When added to an initial rack order, this indicator is used to specify the sixteenth rack for a multi rack order.

When added to an initial rack mountable device order, this indicator is used to specify that the rack mountable device (such as a system or I/O drawer) is to be mounted in rack #16 of a multi rack order.
Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#4793) - Power Active Memory Expansion Enablement

This feature enables memory expansion on the system. Using compression/decompression of memory content can effectively expand the maximum memory capacity providing additional server workload capacity and performance.

- Attributes provided: None
- Attributes Required: Available HMC
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5000) - Software Preload Required

(No longer available as of February 28, 2019)

Indicates that preloaded software and/or consolidated I/O is shipped with the initial order. A maximum of one (#5000) is supported. This feature has country-specific usage.

- Attributes provided: Software Pre-load
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#5227) - PowerVM Standard Edition

This feature allows the customer to create partitions that are in units of less than 1 CPU (sub-CPU LPARs) and allows the same system I/O to be virtually allocated to these partitions. When PowerVM is installed in the system, all activated processors must have the PowerVM feature. A fully activated 4-core system requires that four of this feature be ordered. An encrypted key is supplied to the customer and is installed on the system, authorizing the partitioning at the sub-processor level. Note: If feature 5227 is ordered, the quantity ordered must be equal to the number of active processors.

- Attributes provided: Capability to partition processor
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5228) - PowerVM Enterprise Edition

This feature allows the customer to create partitions that are in units of less than 1 CPU (sub-CPU LPARs) and allows the same system I/O to be virtually allocated to these partitions. When PowerVM is installed in the system, all activated processors must have the PowerVM feature. A fully activated 4-core system requires that four of this feature be ordered. An encrypted key is supplied to the customer and is installed on the system, authorizing the partitioning at the sub-processor level. PowerVM Enterprise Edition also includes Live Partition Mobility, which allows for the movement of a logical partition from one Power6, Power7, Power7+ or Power8 server to another Power6, Power7, Power7+ or Power8 with no application downtime. Note: If feature 5228 is ordered, the quantity ordered must be equal to the number of active processors.

- Attributes provided: Capability to partition processor
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5260) - PCIe2 LP 4-port 1GbE Adapter

This short PCIe Gen2 adapter provides four 1Gb Ethernet ports that can be configured to run at 1000, 100 or 10 Mbps. 4-pair CAT-5 Unshielded Twisted Pair (UTP) cables up to 100 meters in length are attached to the copper RJ45 connectors. Each port is independent of one another and supports full-duplex or half-duplex. 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

Feature #5260 and #5899 are electronically identical and have the same CCIN of 576F. #5260 indicates a low profile tail stock while #5899 indicates a full high tail stock.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four-port 1 Gb Ethernet
- Attributes required: 1 Low Profile (LP) PCIe slot (Gen1 or Gen2)
- Minimum required: 1
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#5269) - PCIe LP POWER GXT145 Graphics Accelerator

This feature is the Low Profile (LP) equivalent of feature number 5748. The POWER GXT145 is a versatile, low-priced 2D graphics accelerator. It can be configured to operate in either 8-bit or 24-bit color modes. This adapter supports both analog and digital monitors. The adapter requires a PCI Express slot. If attaching a device that requires a 15 pin D-Shell receptacle for a VGA connection (eg. when the graphic adapter output is routed directly to a 7316-TF3 display or indirectly through a KVM switch), order a VGA to DVI Connection Converter, feature number 4276 to accommodate the attaching device. A short converter cable is included which adapts the 2nd 28-pin port on the adapter to 15-pin D-Shell receptacle.

Limitation: Placement of this PCIe adapter is not supported in the PCIe Gen3 I/O Drawer.

Limitation: Not supported by VIOS

- Hardware Description
  - 128-bit graphics processor
  - 8-bit indexed, 8-bit true color, or 24-bit true color
  - 32 MB SDRAM
  - x1 PCI Express interface
  - 2 DVI-I (analog/digital video) connectors
  - 1 converter cable
- Features Supported
  - Up to approximately 16.7 million colors
  - Rectangular clipping
  - 1 monitor connected analog at up to 2048 x 1536 resolution
  - 1 monitor connected digital at up to 1280 x 1024 resolution
  - 2nd monitor supported on secondary connecter at up to 1600 x 1200 analog or 1280 x 1024 digital
  - 2nd monitor support in AIX is only in clone mode with an analog connection
- APIs Supported
  - X-Windows and Motif
- Software Requirements
  - The total number of graphics adapters in any one partition may not exceed four.
- Attributes provided: 2D Graphics Adapter
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - SUSE Linux Enterprise 11, Service Pack 3, or later
  - AIX 6.1 and 7.1 or later supported
  - IBM i not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5270) - PCIe LP 10Gb FCoE 2-port Adapter

This feature is the Low Profile (LP) equivalent of feature number 5708. 10 Gb FCoE PCIe Dual Port Adapter (#5708/5270) is a high- performance, 10 Gb, dual port, PCIe Converged Network Adapter (CNA) utilizing SR optics. Each port can provide NIC (Network Interface Card) traffic and Fibre Channel functions simultaneously. CCIN is 2B3B

Highlights

- PCIe 2.0 adapter with x8 Gen 1
- Convergence Enhanced Ethernet (CEE) supported
- SR optical transceiver with LC connection provides up to 300m cable length
- Non-volatile error log on the adapter
- Supported with AIX and Linux and VIOS for FC and Ethernet NIC.
- Supported with IBM i under VIOS for FC and Ethernet NIC
- SAN and Network boot support for AIX, Linux
- Requires FCoCEE capable switches for full FC+Ethernet capability. Ethernet only functionality if attached to ordinary Ethernet switch.
- Utilizes existing cabling that supports 10 Gb SR
- Based on the QLogic Converged Network Adapter (CNA)
- NPIV support requires VIOS for all OS environments

Configuration maximum when used for NIC traffic (not Fibre Channel usage)

- Recommended performance Max assuming high utilization, One adapter per four active processors cores.
- Recommended connectivity Max assuming high utilization, two adapters per one physical processor core.
- Attributes provided: 10Gb FCoE PCIe Dual Port Adapter (LP)
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
    - These additional AIX levels are supported in an LPAR using virtualized I/O only:
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#5271) - PCIe LP 4-Port 10/100/1000 Base-TX Ethernet Adapter

This is the low-profile (LP) equivalent of feature number 5717. The 4-Port 10/100/1000 Base-TX PCI Express Adapter is a short/ low- profile, full duplex, four-ported Gigabit Ethernet adapter that can be configured to run any of the ports at 1000,100 or 10 Mbps data rate. This adapter interfaces to the system via a PCIe bus and connects to a network using a 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable for distances of up to 100m. Each port is independent of one another and is boot capable under AIX Network Instalationl Managment (NIM). The adapter conforms to the IEEE 802.3ab 1000Base-T standard. The #5717 supports jumbo frames when running at the 1000 Mbps speed.

The 4-Port 10/100/1000 Base-TX PCI Express adapter (#5717) should be considered where maximum port density is required per I/O card slot. For a suggested maximum number of adapters considering performance, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit.

Limitations: The 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

- Attributes provided: Four-port Gigabit Ethernet
- Attributes required: 1 low-profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
    - These additional AIX levels are supported in an LPAR using virtualized I/O only:
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#5273) - PCIe LP 8Gb 2-Port Fibre Channel Adapter

(No longer available as of December 13, 2019)

This feature is the Low Profile (LP) equivalent of feature number 5735.

The 8 Gigabit PCI Express Dual Port Fibre Channel Adapter is a high-performance 8x short form adapter based on the Emulex LPe12002 PCIe Host Bus Adapter (HBA). Each port provides single initiator capability over a fibre link. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiates to the highest speed possible. LEDs on each port provide information on the status and link speed of the port.

The adapter connects to a Fibre Channel switch (AIX, IBM i, Linux,VIOS). If in an IBM i environment, devices can also be directly attached.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables.

The following table shows the supported distances for the three different cable types at the three different link speeds.

```
 Cable   2.125 Gbps    4.25 Gbps    8.5 Gbps
 ------  ------------  -----------  -----------
 OM3     .5m - 500m    .5m - 380m   .5m - 150m
 OM2     .5m - 300m    .5m - 150m   .5m - 50m
 OM1     .5m - 150m    .5m - 70m    .5m - 21m
```

See also feature #EN0F or #EN0G for a 2-port 8Gb Fibre Channel adapter based on a QLogic adapter.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) In some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.

Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#5274) - PCIe LP 2-Port 1GbE SX Adapter

(No Longer Available as of February 24, 2015)

This feature is the Low Profile (LP) equivalent of feature number 5768. The IBM 2-Port Gigabit Ethernet-SX PCI Express (PCIe) Adapter provides two 1 Gbps (1000 Base-SX) full-duplex Ethernet LAN connections. The adapter interfaces to the system via a PCIe bus. It is PCIe x4 capable and conforms to the PCIe 1.0a standard. The adapter connects to a network using a 50/62.5 micron shortwave (850 nm) multimode optical cable that conforms to the IEEE 802.3z standard. The adapter supports distances of 260m for 62.5 micron Multi Mode Fiber (MMF) and 550m for 50.0 micron MMF. AIX Network Install Manager (NIM) boot capability is supported with this adapter.

A function called 'Large Send' or sometimes known as TCP Segmentation is also provided by this adapter. This function offloads the TCP segmentation operation from the AIX IP layer to the adapter for outgoing (transmit side) TCP segments. Another function known as "Checksum Offload" which offloads the TCP Checksum Operation or workload from the CPU to the adapter is also provided.

For a suggested maximum number of adapters taking performance into consideration, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit.
Note: The 2-Port IBM Gigabit Ethernet-SX PCIe Adapter incorporates an LC type connector on the card. This new, smaller form factor connector is being used by the industry for the next generation of fiber optic networks. If connecting into an older, existing SC type connector network, an LC-SC 62.5 Micron Fiber Converter Cable (#2459) or LC-SC 50 Micron Fiber Converter Cable (#2456) is required.

Limitation: Half Duplex (HDX) mode is not supported.

- Attributes provided: Two full-duplex 1000Base-SX fibre connections to Gigabit Ethernet LAN(s)
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
    - These additional AIX levels are supported in an LPAR using virtualized I/O only:
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#5275) - PCIe LP 10GbE SR 1-port Adapter

(No Longer Available as of July 14, 2017)

This feature is the Low Profile (LP) equivalent of feature number 5769. The 10 Gigabit Ethernet-SR PCI Express Adapter is a low- profile, high performance adapter that uses a LC Duplex type connector and is capable of transferring data a distance of 300m over MMF-850nm Fiber cable. The product conforms to the IEEE, 802.3ae 10GBASE-SR specification for Ethernet transmission.

Highlights

- Implements iWARP RDMA/RDDP (Remote Direct Data Placement) which adheres to IETF (Internet Engineering Task Force) standards. (Linux Only)
- RDMA-enabled NIC (RNIC) specifically optimized for cluster computing (Linux Only)
- Full iSCSI initiator and target mode stack (Linux Only)
    - iSCSI Header & Data Digest (CRC) generation & checking (Linux Only)
    - PDU recovery (Linux Only)

Attributes

- MSI-X, MSI and support of legacy pin interrupts
- 10GBASE-SR short-reach optics
- IEEE 802.3ae (10 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- Receive side scaling and packet steering
- Line rate packet filtering and attack protection
- IETF RDDP and RDMAC iWARP compliance (Linux Only)
- APIs: RNIC-PI, kDAPL and OpenFabrics 1.4 (Linux Only)
- Attributes provided: PCIe-V1.1 x8 10GBASE-SR short-reach optics adapter (LP)
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#5276) - PCIe LP 4Gb 2-Port Fibre Channel Adapter

This feature is the Low Profile (LP) equivalent of feature number 5774. The 4 Gigabit Dual Port Fibre Channel Adapter is a 64-bit address/data, short form factor PCIe adapter with an LC type external fiber connector. With the use of appropriate optical fiber cabling, this adapter provides the capability for a network of high-speed local and remote located storage. The adapter will auto-negotiate for the highest data rate between adapter and an attaching device at 1 Gbps, 2 Gbps or 4 Gbps of which the device or switch is capable. Between the adapter and an attaching device or switch, the distances supported are up to: 500 meters running at 1 Gbps data rate, 300 meters running at 2 Gbps data rate, and 150 meters running at 4 Gbps data rate. When used with IBM Fibre Channel storage switches supporting long-wave optics, distances of up to 10 kilometers are capable running at either 1 Gbps, 2 Gbps, or 4 Gbps data rates.

The 4 Gigabit PCIe Dual Port Fibre Channel Adapter can be used to attach devices either directly, or by means of Fibre Channel Switches. If attaching a device or switch with a SC type fiber connector(s), use of an LC-SC 50 Micron Fiber Converter Cable (#2456) or a LC-SC 62.5 Micron Fiber Converter Cable (#2459) is required.

Refer to the following IBM storage subsystem web page for additional supported server attachment information for IBM devices.

http://www.ibm.com/servers/storage/product/products_p series.html
Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: Dual-port Fibre channel
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

#5735 feature indicates a full high adapter. #5273 feature indicates a low profile adapter which is electronically identical. CCIN is 577D. Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

- Attributes provided: Dual port fibre channel
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Supports PowerKVM and VIOS. Refer to Software Requirements for specific code levels supported.

(#5277) - PCIe LP 4-Port Async EIA-232 Adapter

This feature is the Low Profile (LP) equivalent of feature number 5785. One connector on the rear of the adapter provides attachment for a fan-out cable (provided) which provides four EIA-232 ports.

Note #5785 and # 5277 are physically and electrically identical adapters, except for the type of PCIe slot used (full-high or low profile). Note also the 4-port #5277/5785 is functionally nearly identical to the 2-port #5289/5290 except for the number and type of connectors.

- Attributes provided: 4-Port Asynchroous EIA-232 via 4-Port DB9 DTE Fan-Out Cable 1.2 M (4 ft.), 4 x 9-pin D-Sub (Male DB-9) and 1 x 68-pin D-Sub (HD-68)
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - IBM i not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5278) - PCIe LP 2-x4-port SAS Adapter 3 Gb

(No longer available as of December 31, 2020)

This feature is the Low Profile (LP) equivalent of feature number 5901. The #5901/5278 PCIe Dual-4x SAS Adapter is a low-profile short form factor adapter which supports the attachment of SAS disk, tape, and DVD using a pair of mini SAS 4x connectors. From a high level perspective, it is functionally equivalent to the #5912 PCI-X SAS adapter and provides a high-performance connection to SAS devices.

The #5901/5278 supports external SAS tape drives such as the DAT72, DAT160, LTO-4, LTO-5, LTO-6, and LTO-7 found in the IBM tape units such as the 7226-1U3, 7214-1U2, TS2240, TS2340, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD-ROM/RAM drives. SAS adapter-to-enclosure (AE) cables are used to attach these drives. See also feature EJ1P.

The #5901/5278 supports SAS SFF disk drives located in a PCIe 12X I/O Drawer or SAS disk drives located in an EXP 12S Disk Drawer or drives in a POWER6 or POWER7 system CEC (split DASD backplane). AIX/ Linux formatted SAS drives are supported with RAID 0 (with mirroring) and RAID 10. IBM i formatted SAS drives are supported and data spreading and mirroring functions are provided by IBM i. RAID-5 or RAID-6 are not supported on the #5901/5278. #5901/5278 has zero write cache. CCIN for #5901/5278 is 57B3.

With proper cabling and configuration, multiple wide ports are used to provide redundant paths to each dual port SAS disk . The adapter manages SAS path redundancy and path switching should a SAS drive failure occur. SAS Y cables attach SAS disk drives in an EXP 12S Disk Drawers. SAS #3688 cables attach SFF SAS drives in an PCIe 12X I/O Drawer. In the EXP 12S Drawer, a high availability I/O configuration can be created using a pair of #5901, a pair of 5278 or a paired 5901/5278 adapters and SAS X cables to protect against the failure of a SAS adapter. In the PCIe 12X I/O Drawer, this function is provided via the internal wiring within the drawer itself.

Limitation: 4k byte sector HDD/SSD are not supported. Only 5xx byte sector drives are supported on this generation of PCIe adapter.

Highlights:

- Supports up to 48 SAS disks, when configured with four #5886 EXP 12S Disk Drawers
- Supports up to 42 disk (18 SFF disk plus up to 24 3.5-inch SAS disk) when configured with a #5802 19-inch PCIe 12X I/O Drawer and two #5886 EXP 12S Disk Drawers
- Supports up to 50 disk (26 SFF disk plus up to 24 3.5-inch SAS disk) when configured with a #5803 24-inch PCIe 12X I/O Drawer and two #5886 EXP 12S Disk Drawers
- SAS speed = 3 Gbs
- SATA speed = 1.5 Gbs
- SAS Serial SCSI Protocol (SSP), Serial ATA Tunneling Protocol (STP) and Serial Management Protocol (SMP)
- Dual controller supports mirrored RAID parity footprints
- Concurrent firmware update
- Attributes provided: Eight physical links via two mini SAS 4x connectors
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5280) - PCIe2 LP 4-Port 10GbE&1GbE SR&RJ45 Adapter

(No Longer Available as of February 23, 2017)

This PCIe Gen2 Ethernet adapter provides two 10 Gb SFP+ SR optical transceiver ports and two 1 Gb RJ45 ports. This is a low profile adapter.

For the 10Gb ports, LC Duplex type connectors and MMF-850nm fiber cable are used. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3, up to 300 meter fiber cable lengths are supported.

For the 1Gb RJ45 ports, The RJ45 port, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters is supported. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

Note #5744 and #5280 adapters are physically and electronically identical except for their low profile or full high PCI slot attribute.

Highlights

- Implements iWARP RDMA/RDDP (Remote Direct Data Placement) which adheres to IETF (Internet Engineering Task Force) standards. (Linux and 10 Gb port Only)
- RDMA-enabled NIC (RNIC) specifically optimized for cluster computing (Linux and 10 Gb port Only)
- Full iSCSI initiator and target mode stack (Linux and 10 Gb port Only)
- iSCSI Header & Data Digest (CRC) generation & checking (Linux and 10 Gb port Only)
- PDU recovery (Linux and 10 Gb port Only)

Attributes

- MSI-X, MSI and support of legacy pin interrupts
- 10GBASE-SR short-reach optics
- IEEE 802.3ae (10 GbE)
- IEEE 802.3ab (1 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- IETF RDDP and RDMAC iWARP compliance (Linux and 10 Gb port Only)
- APIs: RNIC-PI, kDAPL and OpenFabrics 1.4 (Linux and 10 Gb port Only)

Homologation:

This feature is not certified for connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

- Attributes provided: PCIe-V1.1 x8 10GBASE-SR short -reach optics adapter
- Attributes required: 1 PCI Express slot Low Profile (LP), Fiber Cable (Optional LC-SC 62.5 micron converter cable, 50 micron LC-SC connections), LC wrap plug-d
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux 6
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#5281) - PCIe LP 2-Port 1GbE TX Adapter

The IBM PCIe LP 2-Port 1GbE TX Adapter is a Full Duplex, dual ported, Gigabit Ethernet adapter designed with highly integrated components. This adapter can be configured to run each port at 10, 100, or 1000 Mbps data rates. The adapter interfaces to the system via a PCIe bus. It is PCIe x4 capable and conforms to the PCIe 1.0a standard. The adapter connects to a network using a 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable for distances of up to 100m. AIX Network Install Manager (NIM) boot capability is supported with this adapter. The adapter conforms to the IEEE 802.3ab 1000Base-T standard. The adapter also supports jumbo frames when running at the 1000 Mbps speed.

A function called 'Large Send' or sometimes known as TCP Segmentation is also provided by this adapter. This function offloads the TCP segmentation operation from the AIX IP layer to the adapter for outgoing (transmit side) TCP segments. Another function known as "Checksum Offload" offloads the TCP Checksum Operation or workload from the CPU to the adapter is also provided.

The IBM 2-Port 10/100/1000 Base-TX Ethernet PCIe Adapter (#5281) should be considered where maximum port density is required per I/O card slot. For a suggested maximum number of adapters taking performance into consideration, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit. The adapter is the same as 5767 and CINN.

Limitations: The 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

- Attributes provided: Two full-duplex 10/100/1000Base-TX UTP connections to Gigabit Ethernet LAN(s).
- Attributes required: One available PCIe card slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#5283) - PCIe2 LP 2-Port 4X IB QDR Adapter 40Gb

(No Longer Available as of January 20, 2017)

The PCIe Gen-2 low profile 2-port 4X Infiniband QDR adapter provides high speed connectivity with other servers or IB switches. Each port maximum of 40Gb assumes no other system or switch bottlenecks are present.
Note: A PCIe Gen2 slot does not have the bandwidth to support two 40Gb ports. The benefit of the second 40Gb port is additional attachment redundancy, not performance. Also note: AIX supports multiple types of adapter usages across different applications and adapter performance should generally meet or exceed client needs. But when using TCP/IP, some AIX clients may observe less than full unidirectional link bandwidth and less than linear scaling for duplex bandwidth with the #5283.
Note: As of 3/12/2013 This feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and Abu Dhabi and Yemen.

Limitation: Not supported by VIOS

- Attributes provided: PCIe2 LP 2-Port 4X IB QDR Adapter 40Gb
- Attributes required: PCIe Gen2 low profile slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5284) - PCIe2 LP 2-port 10GbE SR Adapter

The PCIe2 2-port 10GbE SR Adapter is a low-profile capable, high performance adapter that uses a LC Duplex type connector and is capable of transferring data a distance of 300m over MMF-850nm Fiber cable. The product conforms to the IEEE, 802.3ae 10GBASE-SR specification for Ethernet transmission.

Characteristics

- MSI-X and support of legacy pin interrupts
- 10GBASE-SR short-reach optics
- IEEE 802.3ae (10 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4
- TCP segmentation Offload (TSO) for IPv4
- UDP checksum offload for IPv4
- Receive side scaling and packet steering
- Line rate packet filtering and attack protection
- Attributes provided: PCIe-gen 2.0 x8 10GBASE-SR short-reach optics adapter
- Attributes required: 1 Low Profile Gen2 (LP) slot, Fiber Cable (Optional LC-SC 62.5 micron converter cable, 50 micron LC-SC connections), LC wrap plug-d
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#5285) - PCIe2 2-Port 4X IB QDR Adapter 40Gb

(No Longer Available as of January 20, 2017)

The PCIe Gen-2 2-port 4X Infiniband QDR adapter provides high speed connectivity with other servers or IB switches. Each port maximum of 40Gb assuming no other system or switch bottlenecks are present. This adapter performs the same function as #5283 but with a high profile (HP) tail stock and cannot be plugged into a low profile Gen-2 slot.

Limitation: Not supported by VIOS

- Attributes provided: PCIe2 2-Port 4X IB QDR Adapter 40Gb
- Attributes required: PCIe Gen2 full high slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - SUSE Linux Enterprise Server 11 Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 5 or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 10 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 5 or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 10 or later
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5287) - PCIe2 2-port 10GbE SR Adapter

The PCIe2 2-port 10GbE SR Adapter is a full high, Gen2, high performance adapter that uses a LC Duplex type connector and is capable of transferring data a distance of 300m over MMF-850nm Fiber cable. The product conforms to the IEEE, 802.3ae 10GBASE-SR specification for Ethernet transmission.

Characteristics

- MSI-X and support of legacy pin interrupts
- 10GBASE-Direct attach SFP+ twinax cable
- IEEE 802.3ae (10 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 KB
- TCP checksum offload for IPv4
- TCP segmentation Offload (TSO) for IPv4
- UDP checksum offload for IPv4
- Receive side scaling and packet steering
- Line rate packet filtering and attack protection
- Attributes provided: PCIe-gen 2.0 x8 10GBASE-SR short-reach optics adapter
- Attributes required: 1 full high Gen2 PCIe slot, Fiber Cable (Optional LC-SC 62.5 micron converter cable, 50 micron LC-SC connections), LC wrap plug-d
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - SUSE Linux Enterprise Server 11 Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 5 or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 10 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 5 or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 10 or later
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5290) - PCIe LP 2-Port Async EIA-232 Adapter

(No longer available)

Adapter provides connection for 2 asynchronous EIA-232 devices. Ports are programmable to support EIA-232 protocols, at a line speed of 128K bps. Two RJ45 connections are located on the rear of the adapter. To attach to devices using a 9-pin (DB9) connection, use an RJ45-to-DB9 converter. For convenience, one converter is included with this feature. One converter for each connector needing a DB9 connector is needed.

The converter cable shipped with the feature is a 10-pin RJ-45 approximately 30 cm or 1 foot in length. 10-pin is often used for DCE devices like modems. DTE devices may be able to use fewer pin connections. Multiple RJ-45 pin out options are used and sold across the industry. The #3930 feature provides an 8-pin RJ45-to-DB9 converter cable. If an addition 10-pin RJ45-to-DB9 connector like the cable provided with the adapter is desired, it is commonly available from multiple sources and identified as a serial cable with a Digi part number 76000239. It is also possible to look up the cable's pin out specifications and build your own cables.

Note #5289 and # 5290 are physically and electrically identical adapters, except for the type of PCIe slot used (full-high or low profile). Note also the 2-port #5289/5290 is functionally nearly identical to the 4-port #5785/5277 except for the number and type of connectors.

Limitation: IBM i only supports use on POWER7 and POWER7+ servers

- Attributes provided: 2-Port Asynchronous EIA-232 via 2x RJ45 connectors, one RJ45-to-DB9 converter cable.
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 0 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: MUST REMOVE
- CSU: Yes
- Return parts MES: No
  Note: KVM - supported, refer to the Software Requirements section for the supported KVM levels

(#5708) - 10Gb FCoE PCIe Dual Port Adapter

10 Gb FCoE PCIe Dual Port Adapter (#5708) is a high-performance, 10 Gb, dual port, PCIe Converged Network Adapter (CNA) utilizing SR optics. Each port can provide NIC (Network Interface Card) traffic and Fibre Channel functions simultaneously. CCIN is 2B3B See also feature #5270 for the identical adapter except it has a low profile tail stock.

Highlights

- PCIe 2.0 adapter with x8 Gen 1
- Convergence Enhanced Ethernet (CEE) supported
- SR optical transceiver with LC connection provides up to 300m cable length
- Non-volatile error log on the adapter
- Supported with AIX and Linux and VIOS for FC and Ethernet NIC.
- Supported with IBM i under VIOS for FC and Ethernet NIC
- SAN and Network boot support for AIX, Linux
- Requires FCoCEE capable switches for full FC+Ethernet capability. Ethernet only functionality if attached to ordinary Ethernet switch.
- Utilizes existing cabling that supports 10 Gb SR
- Based on Qlogic Converged Network Adapter (CNA)
- NPIV support requires VIOS for all OS environments

Configuration maximum when used for NIC traffic (not Fibre Channel usage)

- Recommended performance Max assuming high utilization, One adapter per four active processors cores.
- Recommended connectivity Max assuming high utilization, two adapters per one physical processor core.
- Attributes provided: 10 Gb FCoE PCIe Dual Port Adapter
- Attributes required: Open PCIe slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
    - AIX - supportred
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5717) - 4-Port 10/100/1000 Base-TX PCI Express Adapter

The 4-Port 10/100/1000 Base-TX PCI Express Adapter is short/ low- profile, full duplex, four-ported Gigabit Ethernet adapter that can be configured to run any of the ports at 1000,100 or 10 Mbps data rate. This adapter interfaces to the system via a PCIe bus and connects to a network using a 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable for distance of up to 100m. Each port is independent of one another and is boot capable under AIX Network install manager (NIM). The adapter conforms to the IEEE 802.3ab 1000Base-T standard. The #5717 supports jumbo frames when running at the 1000 Mbps speed.

The 4-Port 10/100/1000 Base-TX PCI Express adapter (#5717) should be considered where maximum port density is required per I/O card slot. For a suggested maximum number of adapters considering performance, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit.

Limitations: The 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

- Attributes provided: Four-ported Gigabit Ethernet
- Attributes required: One available PCIe card slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5729) - PCIe2 8Gb 4-port Fibre Channel Adapter

(No longer available as of December 13, 2019)

PCIe Gen2 8 Gigabit quad port Fibre Channel Adapter is a high- performance 8x short form adapter based on the Emulex LPe12004 PCIe Host Bus Adapter (HBA). Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiate to the highest speed possible. LEDs on each port provide information on the status and link speed of the port.

The adapter connects to a Fibre Channel switch. Direct device attachment has not been tested and is not supported.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables.

The following table shows the supported distances for the three different cable types at the three different link speeds.

```
Cable | 2.125 Gbps | 4.25 Gbps | 8.5 Gbps |
------|------------|-----------|----------|
OM3   |.5m - 500m  |.5m - 380m |.5m - 150m|
OM2   |.5m - 300m  |.5m - 150m |.5m - 50m |
OM1   |.5m - 150m  |.5m - 70m  |.5m - 21m |
```

#5729 feature indicates a full high adapter. CCIN is 5729.

A Gen2 PCIe slot is required to provide the bandwidth for all four ports to operate at full speed.

Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: Four Port Fibre Channel Adapter
- Attributes required: 1 Empty PCIe Gen2 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - VIOS supported

(#5735) - 8 Gigabit PCI Express Dual Port Fibre Channel Adapter

(No longer available as of December 13, 2019)

The 8 Gigabit PCI Express Dual Port Fibre Channel Adapter is a high-performance 8x short form adapter based on the Emulex LPe12002 PCIe Host Bus Adapter (HBA). Each port provides single initiator capability over a fibre link. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiates to the highest speed possible. LEDs on each port provide information on the status and link speed of the port.

The adapter connects to a Fibre Channel switch (AIX, IBM i, Linux,VIOS). If in an IBM i environment, devices can also be directly attached.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables.

The following table shows the supported distances for the three different cable types at the three different link speeds.

```
Cable | 2.125 Gbps | 4.25 Gbps | 8.5 Gbps  |
------|------------|-----------|-----------|
OM3   |.5m - 500m  |.5m - 380m |.5m - 150m |
OM2   |.5m - 300m  |.5m - 150m |.5m - 50m  |
OM1   |.5m - 150m  |.5m - 70m  |.5m - 21m  |
```

#5735 feature indicates a full high adapter. #5273 feature indicates a low profile adapter which is electronically identical. CCIN is 577D. Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also feature #EN0F or #EN0G for a 2-port 8Gb Fibre Channel adapter based on a QLogic adapter.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) In some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: Dual Port Fibre Channel
- Attributes required: 1 Empty PCIe slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5744) - PCIe2 4-Port 10GbE&1GbE SR&RJ45 Adapter

(No Longer Available as of February 23, 2017)

This PCIe Gen2 Ethernet adapter provides two 10 Gb SFP+ SR optical transceiver ports and two 1 Gb RJ45 ports. This is a full high adapter.

For the 10Gb ports, LC Duplex type connectors and MMF-850nm fiber cable are used. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3, up to 300 meter fiber cable lengths are supported.

For the 1Gb RJ45 ports, The RJ45 port, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters is supported. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported. Note #5744 and #5280 adapters are physically and electronically identical except for their low profile or full high PCI slot attribute.

Highlights

- Implements iWARP RDMA/RDDP (Remote Direct Data Placement) which adheres to IETF (Internet Engineering Task Force) standards. (Linux and 10 Gb port Only)
- RDMA-enabled NIC (RNIC) specifically optimized for cluster computing (Linux and 10 Gb port Only)
- Full iSCSI initiator and target mode stack (Linux and 10 Gb port Only)
- iSCSI Header & Data Digest (CRC) generation & checking (Linux and 10 Gb port Only)
- PDU recovery (Linux and 10 Gb port Only)

Attributes

- MSI-X, MSI and support of legacy pin interrupts
- 10GBASE-SR short-reach optics
- IEEE 802.3ae (10 GbE)
- IEEE 802.3ab (1 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- IETF RDDP and RDMAC iWARP compliance (Linux and 10 Gb port Only)
- APIs: RNIC-PI, kDAPL and OpenFabrics 1.4 (Linux and 10 Gb port Only)
- Attributes provided: PCIe-V1.1 x8 10GBASE-SR short -reach optics adapter
- Attributes required: PCI Express full high slot, Fiber Cable (Optional LC-SC 62.5 micron converter cable, 50 micron LC-SC connections), LC wrap plug-d
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5767) - 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter

The IBM 2-Port 10/100/1000 Base-TX Ethernet PCI Express (PCIe) Adapter is a Full Duplex, dual ported, Gigabit Ethernet adapter designed with highly integrated components. This adapter can be configured to run each port at 10, 100, or 1000 Mbps data rates. The adapter interfaces to the system via a PCIe bus. It is PCIe x4 capable and conforms to the PCIe 1.0a standard. The adapter connects to a network using a 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable for distances of up to 100m. AIX Network Install Manager (NIM) boot capability is supported with this adapter. The adapter conforms to the IEEE 802.3ab 1000Base-T standard. The adapter also supports jumbo frames when running at the 1000 Mbps speed.

A function called 'Large Send' or sometimes known as TCP Segmentation is also provided by this adapter. This function offloads the TCP segmentation operation from the AIX IP layer to the adapter for outgoing (transmit side) TCP segments. Another function known as "Checksum Offload" which offloads the TCP Checksum Operation or workload from the CPU to the adapter is also provided.

The IBM 2-Port 10/100/1000 Base-TX Ethernet PCIe Adapter (#5767) should be considered where maximum port density is required per I/O card slot. For a suggested maximum number of adapters taking performance into consideration, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit.

Limitations: The 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

- Attributes provided: Two full-duplex 10/100/1000Base-TX UTP connections to Gigabit Ethernet LAN(s).
- Attributes required: One available PCIe card slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Linux - supported
  - SUSE Linux Enterprise Server - supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VOS supported

(#5768) - 2-Port Gigabit Ethernet-SX PCI Express Adapter

(No Longer Available as of May 11, 2015)

The IBM 2-Port Gigabit Ethernet-SX PCI Express (PCIe) Adapter provides two 1 Gbps (1000 Base-SX) full-duplex Ethernet LAN connections. The adapter interfaces to the system via a PCIe bus. It is PCIe x4 capable and conforms to the PCIe 1.0a standard. The adapter connects to a network using a 50/62.5 micron shortwave (850 nm) multimode optical cable that conforms to the IEEE 802.3z standard. The adapter supports distances of 260m for 62.5 micron Multi Mode Fiber (MMF) and 550m for 50.0 micron MMF. AIX Network Install Manager (NIM) boot capability is supported with this adapter.

A function called 'Large Send' or sometimes known as TCP Segmentation is also provided by this adapter. This function offloads the TCP segmentation operation from the AIX IP layer to the adapter for outgoing (transmit side) TCP segments. Another function known as "Checksum Offload" which offloads the TCP Checksum Operation or workload from the CPU to the adapter is also provided.

The IBM 2-Port Gigabit Ethernet-SX PCIe Adapter (#5768) should be considered where maximum port density is required per I/O card slot. For a suggested maximum number of adapters taking performance into consideration, see the IBM System p PCI placement guide (SA76-0090) for information about the PCIe slots on your system unit.
Note: The 2-Port IBM Gigabit Ethernet-SX PCIe Adapter incorporates an LC type connector on the card. This new, smaller form factor connector is being used by the industry for the next generation of fiber optic networks. If connecting into an older, existing SC type connector network, an LC-SC 62.5 Micron Fiber Converter Cable (#2459) or LC-SC 50 Micron Fiber Converter Cable (#2456) is required.

Limitation: Half Duplex (HDX) mode is not supported.

- Attributes provided: Two full-duplex 1000Base-SX fiber connections to a Gigabit Ethernet LAN(s).
- Attributes required: One available PCIe card slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VOS supported

(#5769) - 10 Gigabit Ethernet-SR PCI Express Adapter

(No Longer Available as of July 14, 2017)

The 10 Gigabit Ethernet-SR PCI Express Adapter is a full-high, high performance adapter that uses a LC Duplex type connector and is capable of transferring data a distance of 300m over MMF-850nm Fiber cable. The product conforms to the IEEE, 802.3ae 10GBASE-SR specification for Ethernet transmission.

Highlights

- Implements iWARP RDMA/RDDP (Remote Direct Data Placement) which adheres to IETF (Internet Engineering Task Force) standards. (Linux Only)
- RDMA-enabled NIC (RNIC) specifically optimized for cluster computing (Linux Only)
- Full iSCSI initiator and target mode stack (Linux Only)
  - iSCSI Header & Data Digest (CRC) generation & checking (Linux Only)
  - PDU recovery (Linux Only)

Attributes

- MSI-X, MSI and support of legacy pin interrupts
- 10GBASE-SR short-reach optics
- IEEE 802.3ae (10 GbE)
- IEEE 802.1p priority and 802.1Q VLAN tagging
- IEEE 802.3x flow control
- Link aggregation, 802.3ad 802.3 compliance
- IEEE 802.3ad load-balancing and failover
- Ether II and 802.3 encapsulated frames
- Multiple MAC addresses per interface
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- Receive side scaling and packet steering
- Line rate packet filtering and attack protection
- IETF RDDP and RDMAC iWARP compliance (Linux Only)
- APIs: RNIC-PI, kDAPL and OpenFabrics 1.4 (Linux Only)
- Attributes provided: PCIe-V1.1 x8 10GBASE-SR short -reach optics adapter
- Attributes required: PCI Express slot, Fiber Cable (Optional LC-SC 62.5 micron converter cable, 50 micron LC-SC connections), LC wrap plug-d
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise - supported
  - SUSE Linux Enterprise Server - supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VOS supported

(#5771) - SATA Slimline DVD-RAM Drive

This DVD drive reads and writes 4.7GB DVD-RAM discs. It also reads Type II (removable from cartridge) DVD-RAM discs. System boot and install functions are supported with CD-ROM, DVD and DVD-RAM media.

Characteristics

- Supports 8cm and 12cm disk
- CD/DVD-ROM/RAM Read 24X/8X/5X
- DVD-RAM Write 5X
- Buffer Size 2MB and cannot be disabled

Limitations: DVD video is not supported.

- Attributes provided: One 4.7GB SATA Slimline DVD-RAM Drive
- Attributes required: One SATA/SAS slimline (12.7mm) high media bay
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#5774) - 4 Gigabit PCI Express Dual Port Fibre Channel Adapter

(No longer available as of October 19, 2018)

The 4 Gigabit Dual Port Fibre Channel Adapter is a 64-bit address/data, short form factor PCIe adapter with an LC type external fiber connector. With the use of appropriate optical fiber cabling, this adapter provides the capability for a network of high-speed local and remote located storage. The adapter will auto-negotiate for the highest data rate between adapter and an attaching device at 1 Gbps, 2 Gbps or 4 Gbps of which the device or switch is capable. Between the adapter and an attaching device or switch, the distances supported are up to: 500 meters running at 1 Gbps data rate, 300 meters running at 2 Gbps data rate, and 150 meters running at 4 Gbps data rate. When used with IBM Fibre Channel storage switches supporting long-wave optics, distances of up to 10 kilometers are capable running at either 1 Gbps, 2 Gbps, or 4 Gbps data rates.

The 4 Gigabit PCIe Dual Port Fibre Channel Adapter can be used to attach devices either directly, or by means of Fibre Channel Switches. If attaching a device or switch with a SC type fiber connector(s), use of an LC-SC 50 Micron Fiber Converter Cable (#2456) or a LC-SC 62.5 Micron Fiber Converter Cable (#2459) is required.

Refer to the following IBM storage subsystem Web page for additional supported server attachment information for IBM devices.

http://www.ibm.com/servers/storage/product/products_p series.html
Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: 2 Fibre Channel
- Attributes required: 1 Empty PCIe slot
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
    - These additional AIX levels are supported in an LPAR using virtualized I/O only:
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5785) - 4 Port Async EIA-232 PCIe Adapter

Connection for 4 asynchronous EIA-232 devices. Ports are programmable to support EIA-232 protocols, at a line speed of 128K bps. One connector on the rear of the adapter provides attachment for a fan-out cable (provided) which provides four EIA-232 ports.

Note #5785 and # 5277 are physically and electrically identical adapters, except for the type of PCIe slot used (full-high or low profile). Note also the 4-port #5277/5785 is functionally nearly identical to the 2-port #5289/5290 except for the number and type of connectors.

- Attributes provided: 4-Port Asynchronous EIA-232 via 4-Port DB9 DTE Fan-Out Cable 1.2 M (4 ft.), 4 x 9-pin D-Sub (Male DB-9) and 1 x 68-pin D-Sub (HD-68)
- Attributes required: 1 full high PCIe Slot
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - AIX - supported
  - SUSE Linux supported
  - Red Hat Linux supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5805) - PCIe 380MB Cache Dual - x4 3 Gb SAS RAID Adapter

(No Longer Available as of May 13, 2016)

The#5805 PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter is a short, full high form factor adapter that supports the attachment of SAS disk and SAS solid state drives (SSD) using a pair of mini SAS 4x connectors. Write cache can provide an I/O performance boost even if RAID 5/6/10 is not used. From a high-level perspective, except for having a larger write cache, it is very similar to the feature 5902 PCI-X SAS adapter and provides a high-performance connection to SAS devices. Two of feature 5805 provides for mirrored write cache data and mirrored RAID parity footprints between the adapters for superior availability. Feature 5805 is installed in pairs, allowing for redundancy of the write cache. If the feature 5805 pairing is broken, then write cache is disabled. The #5805 can also be paired with a #5903 adapter.

Feature 5805 supports SAS disk drives (HDD) and SAS-bay-based SSD located in a PCIe 12X I/O Drawer or drives located in an EXP 12S Disk Drawer or EXP24S Disk Drawer. AIX/Linux formatted SAS drives can be attached, and RAID 0, RAID 5, RAID 6, and RAID 10 are supported. Similarly, IBM i RAID formatted HDD and SSD can also also be attached, and RAID 5 and RAID 6 is support. AIX, IBM i and Linux also support The #5805 is electronically identical to the #5903 and both the 5903 and 5805 use CCIN number is 574E. The #5805 adapter is slightly more narrow than the #5903 due to the placement of its cache batteries.

With proper cabling and configuration, multiple wide ports are used to provide redundant paths to each dual port SAS disk or SSD.. The adapter manages SAS path redundancy and path switching should a SAS drive failure occur. The pairing of #5805 provides a high availability I/O configuration to protect against the failure of a SAS adapter. SAS X cables attach SAS disk drives in an EXP 12S and/ or EXP24S Disk Drawer. SAS #3688 cables attach SFF SAS drives in an PCIe 12X I/O Drawer. The high availability I/O configuration connection is provided via the internal wiring within the PCIe 12X I/ O drawer itself.

Limitation: 4k byte sector HDD/SSD are not supported. Only 5xx byte sector drives are supported on this generation of PCIe adapter.

Highlights:

- Supports up to 48 SAS disks, when configured with four #5886 EXP 12S Disk Drawers or two #5887/EL1S EXP24S Disk Drawer
- SAS speed = 3 Gbs
- SAS Serial SCSI Protocol (SSP)and Serial Management Protocol (SMP)
- 380 MB of non-volatile fast write cache can increase disk subsystem performance
- Dual controller supports mirrored write cache data and mirrored RAID parity footprints
- Concurrent Firmware Update
- Attributes provided: Eight physical links via two mini SAS 4x connectors
- Attributes required: Configuration always requires even pairs of #5805 (or #5903/5805). SAS Media devices are not supported. When attaching #5886 EXP12S or #5887/EL1S EXP24S at least one of the following SAS (X) cables #3661, #3662 or #3663 must be used
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux - supported
  - SUSE Linux Enterprise - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VOS supported

(#5887) - EXP24S SFF Gen2-bay Drawer

(No Longer Available as of March 31, 2018)

The EXP24S SFF Gen2-bay Drawer is an expansion drawer with twenty-four 2.5-inch form factor SAS bays. #5887 supports up to 24 hot-swap SFF SAS Hard Disk Drives (HDD). It uses only 2 EIA of space in a 19-inch rack. The EXP24S includes redundant AC power supplies and two power cords. The EXP24S SFF bays use Gen-2 or SFF-2 SAS bays that are not compatible with CEC SFF Gen-1 SAS bays or with #5802/ 5803 SFF SAS bays.

With AIX/Linux/VIOS, the EXP24S can be ordered with four sets of 6 bays, two sets of 12 bays or one set of 24 bays (mode 4, 2 or 1). With IBM i the EXP24S can be ordered as one set of 24 bays (mode 1).

The EXP24S SAS ports are attached to SAS controller(s) which can be a SAS PCI-X or PCIe adapter or pair of adapters. The EXP24S can also be attached to an imbedded SAS controller in a server with an imbedded SAS port. Attachment between the SAS controller and the EXP24S SAS ports is via the appropriate SAS Y or X cables.

Limitation: The mode is set at the IBM factory. The capability to change modes after manufacture is not offered.

- Attributes provided: 24 SFF SAS bays, slot filler panels are provided for empty bays when initially shipped from IBM. #5887 rails have some adjustability for depth - 25.25 to 29.875 inches.

- Attributes required:
    - Available SAS controller (PCI or imbedded server controller)
    - Power System server, POWER6 or later
    - Available 2U 19-inch rack space
    - Appropriate SAS cables for configuration mode selected
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS is supported. Refer to the Software Requirements for the supported level.

(#5899) - PCIe2 4-port 1GbE Adapter

This short PCIe Gen2 adapter provides four 1Gb Ethernet ports that can be configured to run at 1000, 100 or 10 Mbps. 4-pair CAT-5 Unshielded Twisted Pair (UTP) cables up to 100 meters in length are attached to the copper RJ45 connectors. Each port is independent of one another and supports full-duplex or half-duplex. 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

Feature #5260 and #5899 are electronically identical and have the same CCIN of 576F. #5260 indicates a low profile tail stock while #5899 indicates a full high tail stock.

Details for the ports include: for 5260 & 5899

- AIX NIM support
- IEEE 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four-port 1 Gb Ethernet
- Attributes required: 1 Full High Profile PCIe slot (Gen1 or Gen2)
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - AIX supported
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5901) - PCIe Dual-x4 SAS Adapter

(No longer available as of December 31, 2020)

The #5901 PCIe Dual-4x SAS Adapter is a low-profile short form factor adapter which supports the attachment of SAS disk, tape, and DVD using a pair of mini SAS 4x connectors. From a high level perspective, it is functionally equivalent to the #5912 PCI-X SAS adapter and provides a high-performance connection to SAS devices.

The #5901 supports external SAS tape drives such as the DAT72, DAT160, LTO-4, LTO-5, LTO-6, and LTO-7 found in the IBM tape units such as the 7226-1U3, 7214-1U2, TS2240, TS2340, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD-ROM/RAM drives. SAS adapter- to-enclosure (AE) cables are used to attach these drives. See also feature #EJ1N.

The #5901 supports SAS SFF disk drives located in a PCIe 12X I/O Drawer or SAS disk drives located in an EXP 12S or EXP24S Disk Drawer or drives in a Power6 system CEC (split DASD backplane). AIX/ Linux formatted SAS drives are supported with RAID 0 (with mirroring) and RAID 10. IBM i formatted SAS drives are supported and data spreading and mirroring functions are provided by IBM i. RAID-5 or RAID-6 are not supported on the #5901. #5901 has zero write cache. CCIN for #5901 is 57B3.

With proper cabling and configuration, multiple wide ports are used to provide redundant paths to each dual port SAS disk . The adapter manages SAS path redundancy and path switching should a SAS drive failure occur. SAS Y cables attach SAS disk drives in an EXP12S or EXP24S Disk Drawers. SAS #3688 cables attach SFF SAS drives in an PCIe 12X I/O Drawer. With the EXP12S or EXP24S Drawer, a high availability I/O configuration can be created using a pair of #5901 adapters and SAS X cables to protect against the failure of a SAS adapter. In the PCIe 12X I/O Drawer, this function is provided via the internal wiring within the drawer itself.

Limitation: 4k byte sector HDD/SSD are not supported. Only 5xx byte sector drives are supported on this generation of PCIe adapter.

Highlights:

- Supports up to 48 SAS disks, when configured with four #5886 EXP12S Disk Drawers or two #5887/#EL1S EXP24S Disk Drawers
- Supports up to 42 disk (18 SFF disk plus up to 24 3.5-inch SAS disk) when configured with a #5802/#EL36 19-inch PCIe 12X I/O Drawer and two #5886 EXP 12S Disk Drawers or configured with a #5802/#EL36 and one #5887/#EL1S EXP24S
- Supports up to 50 disk (26 SFF disk plus up to 24 3.5-inch SAS disk) when configured with a #5803 24-inch PCIe 12X I/O Drawer and two #5886 EXP 12S Disk Drawers or configured with a #5803 and one #5887/#EL1S EXP24S
- SAS speed = 3 Gbs
- SATA speed = 1.5 Gbs
- SAS Serial SCSI Protocol (SSP), Serial ATA Tunneling Protocol (STP) and Serial Management Protocol (SMP)
- Dual controller supports mirrored RAID parity footprints
- Concurrent firmware update
- Attributes provided: Eight physical links via two mini SAS 4x connectors
- Attributes required: One PCI Express slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#5913) - PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6 Gb

The PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6 Gb (#5913) provides high performance HDD or SSD controller function using PCIe Gen2 technology. HDD and SSD can be either SFF or 3.5-inch drives (or both). A pair of adapters are required to provide mirrored write cache data and adapter redundancy. Integrated flash memory provides protection of the write cache without batteries in case of power failure.

The #5913 provides three Mini-SAS HD (high density) connectors for the attachment of SAS drives located in the #5887/EL1S EXP24S, #5886 EPX12S, or #5802/5803/EL36 12X PCIe I/O drawers. X, YO or AT SAS cables with HD connectors are used to attach to these drawers. A max of 3 EXP24S or 6 EXP12S can be attached. If controlling drives in a #5802/5803/EL36 the #5913 pairs must be located in that #5802/ 5803/EL36. An AA SAS cable with HD connectors is attached to the #5913 pair to communicate status and cache content information and is required unless all three ports are being used to attach I/O drawers.

The #5913 provides RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. The adapter provides RAID 5 and RAID 6 for IBM i. IBM i provides both OS mirroring and data spreading. AIX/Linux/VIOS provide OS mirroring (LVM). The adapter's CCIN is 57B5.

Limitation: 4k byte sector HDD/SSD are not supported. Only 5xx byte sector drives are supported on this generation of PCIe adapter

- Attributes provided: PCIe2 1.8 GB Cache RAID SAS Adapter
- Attributes required: One PCIe slot per #5913
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VOS supported

(#5915) - SAS AA Cable 3m - HD 6Gb Adapter to Adapter

This 3 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density)connectors which connect the top connectors of two #5913 1.8GB RAID SAS Adapters. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

An AA cable is always required between a pair of #5913 adapters unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters.

- Attributes provided: high speed connection between two #5913 SAS adapters
- Attributes required: available top connectors on pair of #5913 SAS adapters
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5916) - SAS AA Cable 6m - HD 6Gb Adapter to Adapter

This 6 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density)connectors which connect the top connectors of two #5913 1.8GB RAID SAS Adapters. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

An AA cable is always required between a pair of #5913 adapters unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters.

- Attributes provided: high speed connection between two #5913 SAS adapters
- Attributes required: available top connectors on pair of #5913 SAS adapters
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5917) - SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter

This 1.5 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density)connectors which connect the top connectors of two #5913 1.8GB RAID SAS Adapters. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

An AA cable is always required between a pair of #5913 adapters unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters.

- Attributes provided: high speed connection between two #5913 SAS adapters
- Attributes required: available top connectors on pair of #5913 SAS adapters
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5918) - SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter

This 0.6 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density)connectors which connect the top connectors of two #5913 1.8GB RAID SAS Adapters. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

An AA cable is always required between a pair of #5913 adapters unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters.

- Attributes provided: high speed connection between two #5913 SAS adapters
- Attributes required: available top connectors on pair of #5913 SAS adapters
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5923) - Non-paired PCIe SAS RAID Indicator

(No longer available as of April 24, 2020)

Feature 5923 must be added for every instance of a non-paired SAS RAID adapter #5903. It identifies a specific high availability configuration supported by AIX or Linux which has one #5903 on one system and the paired #5903 located on a second system. IBM i does not support paired adapter on different servers.

- Attributes provided: SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.
- Attributes required: Every #5923 requires a SAS RAID adapter (#5903) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.

- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required: See #5805
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#5924) - Non-paired Indicator 5913 PCIe SAS RAID Adapter

Feature 5924 must be added for every instance of a non-paired SAS RAID adapter #5913. It identifies a specific high availability configuration supported by AIX or Linux which has one #5913 on one system and the paired #5913 located on a second system. IBM i does not support paired adapter on different servers.

- Attributes provided: SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.
- Attributes required: Every #5924 requires a 6Gb/s SAS RAID adapter (#5913) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 0)
- OS level required: See #5913
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#6068) - Opt Front Door for 1.8m Rack

#6068 provides an attractive black full height rack door on the #0551 19 Inch 1.8m Rack. The door is steel, with a perforated flat front surface. The perforation pattern extends from the bottom to the top of the door to enhance ventilation and provide some visibility into the rack.

- Attributes provided: Front Door
- Attributes required: #0551 19 inch 1.8m Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6069) - Opt Front Door for 2.0m Rack

#6069 provides an attractive black full height rack door on the #0553 19 inch 2.0m Rack. The door is steel, with a perforated flat front surface. The perforation pattern extends from the bottom to the top of the door to enhance ventilation and provide some visibility into the rack.

- Attributes provided: Front Door
- Attributes required: #0553 19 inch 2.0 meter Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6248) - 1.8m Rack Acoustic Doors

#6248 provides front and rear doors for use with the #0551 19 inch 1.8m Rack. This door kit provides additional acoustic dampening for use where a quieter environment is desired. #6248 results in a larger footprint and requires additional space.

- Attributes provided: Acoustic Door Kit
- Attributes required: #0551 19 inch 1.8m Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6249) - 2.0m Rack Acoustic Doors

#6249 provides front and rear doors for use with the #0553 19 inch 2.0m Rack. This door kit provides additional acoustic dampening for use where a quieter environment is desired. #6249 results in a larger footprint and requires additional space.

- Attributes provided: Acoustic Door Kit
- Attributes required: #0553 19 inch 2.0 meter Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6263) - 1.8m Rack Trim Kit

This feature provides a decorative trim kit for the front of feature number 0551 (19 inch 1.8m Rack).

- Attributes provided: Decorative trim kit
- Attributes required: #0551 19 inch 1.8m Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: 1x#6263 per #0551

(#6272) - 2.0m Rack Trim Kit

This feature provides a decorative trim kit for the front of feature number 0553 (19 inch 2.0m Rack).

- Attributes provided: Decorative trim kit
- Attributes required: #0553 19 inch 2.0 meter Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: 1X#6272 per #0553

(#6458) - Pwr Crd 4.3m 14ft to IBM PDU

Standard IBM rack power cable that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for IBM PDU C13 receptacle). Note for different length C13/C14 cables see #6671 (2.7M) or #6672 (2.0M).

- Attributes provided: Power jumper cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6460) - Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)

This power cord goes from the system or I/O drawer to the rack OEM power distribution unit or wall socket outlet. Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and plug type #4 (NEMA 5-15) on the other end.

The following countries/regions use the #6460 power cord to power the system and/or peripheral features requiring a power cord: United States, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Calicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Kitts/Nevis, St. Martin, Taiwan, Tortola (BVI), Trinidad/Tobago, Venezuela.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6469) - Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A) U.S.

This power cord goes from the system or I/O drawer to the wall or rack OEM power distribution unit. Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and Plug type #5 (NEMA 6-15) on the other end for wall or OEM PDU.

The following countries/regions use the #6469 power cord to power the system and/or peripheral features requiring a power cord: United States, Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Caicos Is., Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Marten NA, Taiwan, Tortola (BVI), Thailand, Venezuela.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6470) - Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #4 (NEMA 5-15). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. 6-foot length.

The following countries/regions use the #6470 power cord to power the system and/or peripheral features requiring a power cord:

United States, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonnaire, Calicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Kitts/Nevis, St. Martin, Taiwan, Tortola (BVI), Trinidad/Tobago, Venezuela.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6471) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #73 (InMetro NBR 14136). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6471 power cord to power the system and/or peripheral features requiring a power cord:

Brazil

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6472) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #18 (CEE 7 VII). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6472 power cord to power the system and/or peripheral features requiring a power cord:

Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Belarus, Belgium, Benin, Bosnia/Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Conogo, Croatia, Czech Republic, Dahomey, Djibuouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Etrhiopia, Finland, France, French Polynesia, French Guyana, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Kazakhstan, Krygystan, Laos, Latvia, Lebanon, Lintuania, Luxembourg, Macau, Macedonia, Mali, Martinigue, Mauritania, Mauritus, Mayotte, Moldova, Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, North Korea (C19 only), Norway, Poland, Portugal, Principe, Reunion, Romania, Russia, Rwanda, St. Thomas, Saudi Arabia, Senegal, Serbia, Slovenia, Somalia, South Korea (C19 only), Spain, Surinam, Sweden, Syria, Tahiti, Tajikistan, Togo, Tunesia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis & Futuna, Zaire, Zimbabwe.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6473) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #19 (CEE). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6473 power cord to power the system and/or peripheral features requiring a power cord:

Denmark

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6474) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/13A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #23 (BS 1364A). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6474 power cord to power the system and/or peripheral features requiring a power cord:

Abu Dhabi, Bahrain, Botswana, Brunei, Channel Islands, Cyprus, Dominica, Gambia, Grenada, Grenadines, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar, Nkigeria, Oman, Qatar, Sierra Leone, Singapore, St. Kitts, St. Lucia, Seychelles, Sudan, Tanzania, Trinidad & Tobago, United Arab Emirates, United Kingdom, Yemen, Zambia

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6475) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #32 (SII 32-1971). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6475 power cord to power the system and/or peripheral features requiring a power cord:

Israel

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6476) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #24 (SEV 24507). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6476 power cord to power the system and/or peripheral features requiring a power cord:

Lichtenstein, Switzerland

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6477) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #22 (SABS 164). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6477 power cord to power the system and/or peripheral features requiring a power cord:

Bangladesh, LeSotho, Maceo, Maldives, Nambia, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6478) - Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #25 (CEI 23-16). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6478 power cord to power the system and/or peripheral features requiring a power cord: Chile Italy Libya

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6488) Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (125V/15A or 250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. 125V, 15A or 250V, 10A, Plug Type #2. Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6488 power cord to power the system and/or peripheral features requiring a power cord:

Argentina, Paraguay, Uruguay.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6489) - 4.3m (14-Ft) 3PH/32A 380-415V Power Cord

#6489 is a 14-FT/4.3m 3PH/32A power cable with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6491) - 4.3m (14-Ft) 1PH/63A 200-240V Power Cord

#6491 is a 14-FT/4.3m 200-240V/63A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6492) - 4.3m (14-Ft) 1PH/48A 200-240V Power Cord

Feature #6492 is a 14-FT/4.3m 200-240V/48A rated power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes Provided: Power Cord PDU to wall
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6493) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #62 (GB 1053). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6493 power cord to power the system and/or peripheral features requiring a power cord:

People's Republic of China.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6494) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #69 (IS 6538). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6494 power cord to power the system and/or peripheral features requiring a power cord:

India

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6496) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #66 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6496 power cord to power the system and/or peripheral features requiring a power cord: North Korea South Korea

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6577) - Power Cable - Drawer to IBM PDU, 200-240V/10A

This feature permits manufacturing to select the optimum PDU power jumper cord length (1.0M, 2.0M, 2.7M or 4.3M) for rack integration. This feature is mandatory on initial order specifying factory integration with IBM racks (such as with 7014-T00 or T42 racks). Feature is not valid on initial order with non-factory integrated feature 4650. Power jumper cord has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for C13 PDU receptacle).
Note: This feature is not used for MES orders except for bulk orders by SDI clients only. See C13/C14 jumper cord features #6458 (4.3M), #6671 (2.7M), #6672 (2.0M) when not using factory integration.

- Attributes provided: One power jumper cord
- Attributes required: At least one rack and the absence of #4650.
- Minimum required: 0
- Maximum allowed: 114 (Initial order maximum: 114)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: 1 or 2 per I/O drawer or CEC. MES orderable for SDI's only. The MES order will ship the 14 foot cable equivalent to feature number 6458.

(#6580) - Optional Rack Security Kit

This feature provides hardware that can be added to a rack to prevent unauthorized access. It includes keyed front and rear locks for the #0551 and #0553 rack doors. It also includes two sliding bars that mount inside the left and right rack side panels. The sliding bars are accessible when the rack rear door is open. They can be moved to a position that disables the external latches on the rack side panels, and prevents removal of the side panels.

- Attributes provided: Locking hardware for rack doors and sidepanels
- Attributes required: #0551 or #0553 19-Inch Rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6586) - Modem Tray for 19-Inch Rack

(No Longer Available as of December 29, 2017)

This feature provides hardware for installing one or two modems in a 19-inch rack. The modem tray occupies 1U of rack space when it is mounted in the front of the rack. It provides a secure location in the rack for external modems such as the ones attached to the Hardware Management Console.

- Attributes provided: Hdw. to support two modems
- Attributes required: 19-inch rack with 1U rack space available
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6651) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #75 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6651 power cord to power the system and/or peripheral features requiring a power cord: Taiwan

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6653) - 4.3m (14-Ft) 3PH/16A 380-415V Power Cord

#6653 is a 14-FT/4.3m 3PH/16A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6654) 4.3m (14-Ft) 1PH/24A Power Cord

Feature #6654 is a 14-FT/4.3m 200-240V/24A rated locking power cord with a Type 12 plug (NEMA L6-30P) which distributes power from a power source to a Power Distribution Unit.

- Attributes Provided: Power Cord PDU to wall
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6655) - 4.3m (14-Ft) 1PH/24A WR Power Cord

Feature #6655 is a 14-FT/4.3m 200-240V/30A rated water-resistant power cord with a Type 40 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes Provided: Power Cord PDU to wall
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6656) - 4.3m (14-Ft)1PH/32A Power Cord

#6656 is a 14-FT/4.3m 200-240V/32A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6657) - 4.3m (14-Ft) 1PH/32A Power Cord

#6657 is a 14-FT/4.3m 1PH/32A power cord with a Type PDL plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: PDU power cable
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6658) - 4.3m (14-Ft) 1PH/24A Power Cord-Korea

#6658 is a 14-FT/4.3m 200-240V/24A power cord with a Type KP plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: PDU power cable
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6659) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #76 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6659 power cord to power the system and/or peripheral features requiring a power cord: Taiwan

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6660) - Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #59 (NEMA 5-15). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. 14-foot length.

This power cord meets the DENAN marking requirement in Japan.

- Attributes provided: Power Cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6665) - Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)

Standard IBM rack power jumper cord that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C20 on the other end (for IBM PDU C19 receptacle).

Note for power jumper cord which attach to PDUs with C13 receptacles, use features such as #6577, #6458, #6671, or #6672.

- Attributes provided: Power jumper cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6667) - 4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia

#6667 is a 14-FT/4.3m 380-45V/32A power cord with a Type PDL plug which distributes power from a power source to a Power Distribution Unit.

- Attributes provided: PDU power cable
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#6669) - Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)

This power cord goes from the system or I/O drawer to the rack power distribution unit. Plug type #57 (NEMA 6-15). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. 14-foot length. This power cord meets the DENAN marking requirement in Japan.

- Attributes provided: Power Cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6671) - Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A

Standard IBM rack power cable that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for IBM PDU C13 receptacle). Note for different length C13/C14 cables see #6458 (4.3M) or #6672 (2.0M).

- Attributes provided: Power jumper cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6672) - Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A

Standard rack power cable that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for IBM PDU C13 receptacle). Note for different length C13/C14 cables see #6458 (4.3M) or #6671 (2.7M).

- Attributes provided: Power jumper cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6680) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This insulated power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #6 (AS 3112-1964 NZS 198). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6680 power cord to power the system and/or peripheral features requiring a power cord:

Australia, Fiji Islands, Kiribati, Nauru, New Zealand, Papua New Guinea, W. Samoa.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#7109) - Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector

(No longer available as of April 24, 2020)

This feature is for an intelligent AC power distribution unit (PDU+) that will allow the user to monitor the amount of power being used by the devices that are plugged in to this PDU+. This AC power distribution unit provides twelve C13 power outlets. It receives power through a UTG0247 connector. It can be used for many different countries and applications by varying the PDU to Wall Power Cord, which must be ordered separately. Each PDU requires one PDU to Wall Power Cord. Supported power cords include the following features: #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, and #6658.

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Twelve C13 outlets with Power Monitoring Capability
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both

Note: When purchased on an MES order with a feature code rack. This PDU will be mounted in the rear side pockets until all 4 side pockets on the rack have been filled. Any additional PDUs on the order will be mounted in 1 unit of EIA rack space. When purchased as an MES order for addition to a rack in the field. This PDU may not fit in the side pockets of your rack due to a hardware interference with the rack, and may require mounting in 1 unit of rack EIA space. Insure rack space is available before placing the MES order for this PDU when it is being ordered for field installation.

(#7118) - Environmental Monitoring Probe

The Environmental Monitoring Probe (EMP) enables you to remotely monitor environmental conditions. Using a standard Web browser, you can view the ambient temperature and humidity of the remote environment, as well as the status of two additional contact devices, such as a smoke detector or open-door sensor. The temperature/humidity probe plugs into a RJ45 connector an a PDU+. The EMP can be used with any Powerware UPS equipped with a 10/100 Mb ConnectUPS Web/SNMP Card (firmware 3.01 or higher). The EMP can be located up to 20m (65.6 feet) away.

- Attributes provided: Monitoring of temperature, humidity, and status of two contacts/ sensors. A one meter cat5 Ethernet cable, double sided hook and loop fabric, often called VELCRO(R) tape, two tie-wraps, and screw with wall anchor for mounting.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Maximum support is 8x 7118 per 0553 rack and 8x 7118 per 0551 rack. Maximum of one 7118 per 7109 is supported.

(#7188) - Power Distribution Unit

An AC Power Distribution Unit (PDU) which mounts in a 19" rack and provides twelve C13 power outlets. The #7188 has six 16A circuit breakers, with two power outlets per circuit breaker. System units and/or expansion units must use a power cord with a C14 plug to connect to the #7188.

One of the following line cords must be used to distribute power from a wall outlet to the #7188;

- #6489 - 14-Ft 3PH/32A Power Cord
- #6491 - 14-Ft 1PH/63A Power Cord
- #6492 - 14-Ft 1PH/48-60A Power Cord
- #6653 - 14-Ft 3PH/16A Power Cord
- #6654 - 14-Ft 1PH/24-30A Power Cord
- #6655 - 14-Ft 1PH/24-30A WR Power Cord
- #6656 - 14-Ft 1PH/32A Power Cord
- #6657 - 14-Ft 1PH/24A Power Cord
- #6658 - 14-Ft 1PH/24A Power Cord-Korea
- Attributes provided: Power Distribution Unit with Twelve C13 power outlets.
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#7196) Power Distribution Unit (US) - 1 EIA Unit, Universal, Fixed Power Cord

(No longer available as of April 24, 2020)

This AC power distribution unit provides six C19 power outlets. Fixed power cord (IEC309 60A plug (3P+G). This PDU requires 3-phase electrical service.

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Six C19 power outlets
- Attributes required: 3 phase electical service
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#7802) Ethernet Cable, 15m, Hardware Management Console to System Unit

This feature provides a fifteen meter long Ethernet cable for attachment of a Hardware Management Console to the system unit.

- Attributes provided: 15M Ethernet Cable
- Attributes required: Ethernet port on Hardware Management Console
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#8143) - Linux Software Preinstall

(No longer available as of February 28, 2019)

This feature indicates that the Linux operating system is to be preinstalled on the system. Requires feature number 5000.

- Attributes provided: Linux preinstall
- Attributes required: Feature number 5000.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#8144) - Linux Software Preinstall (Business Partners)

(No longer available as of February 28, 2019)

This feature indicates that the Linux operating system is to be preinstalled on the system. Requires feature number 5000 or 7305. This feature is only available to IBM Business Partner - Solution Providers and IBM Business Partner - Systems Integrators.

- Attributes provided: Linux preinstall
- Attributes required: Feature number 5000 or 7305.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#8845) - USB Mouse

(No Longer Available as of October 31, 2017)

The optical LED USB Mouse has 2 buttons and a scroll wheel that acts as a third button. Mouse cable is 1.8 meters long. OS does not support scrolling with the wheel. Business black with red scroll wheel.

- Attributes provided: 2-Button USB Mouse w/scroll wheel that acts as 3rd button.
- Attributes required: USB attachment Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#9169) - Order Routing Indicator- System Plant

(No longer available as of February 28, 2019)

This feature will be auto-selected by the Configurator Tool when required. Use of this feature will affect the routing of the order. Selection of this indicator will direct the order to a system plant for fulfillment.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9300) - Language Group Specify - US English

(No longer available as of February 28, 2019)

English language group for nomenclature and standard publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9359) - specify mode-1 & (1)5901/5278 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 1 (One group of 24 drive bays) with one PCIe 3G SAS controller (#5901 or #5278), utilizing one appropriate YO cable connecting to the I/O Adapter (IOA) ports. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: IOA configuration for Mode 1
- Attributes required: One YO cable (#3691/EL1T 1.5M, #3692/EL1V 3M, #3693/EL1W 6M, #3694/ EL1U 15M) and one port on a #5901/#5278
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9360) - Specify mode-1 & (2)5901/5278 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 1 (One group of 24 drive bays) with two individual PCIe 3G SAS controller (#5901 and/or #5278) utilizing two appropriate YO cables connecting to the 3G I/O Adapter (IOA) ports. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: IOA configurations for Mode 1 with two (#5901 #5278)
- Attributes required: Two YO cables (#3691/EL1T 1.5M, #3692/EL1V 3M, #3693/EL1W 6M, #3694/ EL1U 15M) and one port on each of two #5901/#5278s
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9361) - Specify mode-2 & (2)5901/5278 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 2 (two sets of 12 drive bays) with two PCIe 3G SAS controllers (#5901 and/or #5278) utilizing two appropriate YO cables connecting to I/O Adapter (IOA) ports. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: Designated IOA configurations for Mode 2
- Attributes required: Two YO cables (#3691/EL1T 1.5M, #3692/EL1V 3M, #3693/EL1W 6M, #3694/ EL1U 15M) and one port on each of two #5901/#5278s
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9365) - Specify mode-4 & (4)5901/5278 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 4 (four groups of 6 drive bays) with four PCIe 3G SAS controllers (#5901 and/or #5278) utilizing two appropriate dual X cables connecting to I/O Adapters (IOA) ports. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: IOA configurations for Mode 4
- Attributes required: Two dual X cables (#3661/EL22 1.5M, #3662/EL23 3M, #3663//EL21 15M) and four #5901/#5278s dedicated to the single #5887 or #EL1S.
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9366) - Specify mode-2 & (4)5901/5278 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S will be configured by IBM Manufacturing in Mode 2 (two sets of up to 12 drive bays) with four PCIe 3G SAS controllers (#5901 and/or #5278) utilizing two appropriate dual X cables connecting to I/O Adapters (IOA) ports. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: IOA configurations for Mode 2
- Attributes required: Two dual X cables (##3661/EL22 1.5M, #3662/EL23 3M, #3663//EL21 15M) and four #5901/#5278s dedicated to the single #5887 or #EL1S.
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9367) - Specify mode-1 & (2)5903/5805 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 1 (One group of 1-24 drive bays) with a pair of PCIe 3G SAS RAID controller (either pair #5903 or 5805 or combination of both) utilizing two appropriate YO cable connecting to the 3G I/O Adapter (IOA) ports. This specify only impacts IBM's initial shipment of the EXP24S. IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

- Attributes provided: IOA configurations for Mode 1
- Attributes required: Two YO cables (#3691/EL1T 1.5M, #3692/EL1V 3M, #3693/ EL1W 6M, #3694/ EL1U 15M) and one port on each of two #5903/#5805s
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#9368) - Specify mode-2 & (4)5903/5805 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer(#5887 or EL1S) will be configured by IBM Manufacturing in Mode 2 (two sets of 12 drive bays) with two pair of PCIe 3G SAS RAID controller (either pair #5903 or 5805 or combination of both) utilizing two appropriate X cable connecting to the I/ O Adapters (IOA). IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: IOA configurations for Mode 2
- Attributes required: Two dual X cables (#3661/EL22 1.5M, #3662/EL23 3M, #3663//EL21 15M) and four #5903/#5805s dedicated to the single #5887 or #EL1S".

- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#9385) - Specify mode-1 & (2) 5913 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Specify feature 9385 (Specify mode-1 & (2)5913 for EXP24S #5887or #EL1S) directs manufacturing to configure SFF drawer to Mode 1 (one group of 24 SFF bays) and two pair of PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb (#5913). Select two YO cable #3450/EL25 1.5m, #3451/EL29 3m, #3452/EL28 6m, #3453/EL26 10m) and one AA cable (#5915/EL2C 3m, #5916/EL2D 6m, #5917/ EL2B 1.5m) and AIX, IBM i or Linux. Include one interconnecting 6Gb AA cable (3M #3681 or 6M #3682) between paired SAS adapters. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Configuration #5887/EL1S Mode 1 with two #5913 adapters
- Attributes required: Two YO cables (#3450/EL25 1.5M, #3451/EL29 3M, #3452/ EL28 6M, #3453/ EL26 10M) and one port on each of two #5913s. If fewer than 3 ports on each of the #5913s are used, an AA cable (#5915/EL2C 3M, #5916/ EL2D 6M, #5917/EL2B 1.5M, #5918/EL2A 0.6M) is required to connect the pair of #5913s
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#9386) - Specify mode-2 & (4) 5913 for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Specify feature 9386 (Specify mode-2 & (4)5913 for EXP24S #5887 or #EL1S) directs manufacturing to configure SFF drawer to mode 2 (two sets of 12 SFF bays) and four PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb. Select #5913 and two appropriate length X cable (#3454/EL1Z 3m, #3456/EL1Y 10m). Include AIX, or Linux and select two AA cables (3M #3681 or 6M #3682) between paired SAS adapters. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

Supported by AIX and Linux.

- Attributes provided: Configure #5887/EL1S in Mode 2
- Attributes required: Two dual X cables (#3454/EL1Z 3M, #3455/EL20 6M, #3456/EL1Y 10M), two AA cables (#5915/EL2C 3M, #5916/EL2D 6M, #5917/EL2B 1.5M, #5918/ EL2A 0.6M) and one port on each of four #5913s dedicated to the single #5887/EL1S.
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#9387) - Specify mode-1 & CEC SAS port for EXP24 #5887/EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2 Drawer (#5887 or EL1S) will be configured by IBM Manufacturing in Mode 1 (One group of 24 drive bays) with the two internal 6G SAS ports on the rear of the system unit. Dual IOA high performance/function storage backplane provides the two SAS ports.

Two YO cables connect the EXP24S to the SAS ports. Use the cable length appropriate to the configuration and select from features such as #ECBT, #ECBU, #ECBV or #ECBW.

IBM does not provide changes to the mode setting after #5887 or EL1S is shipped.

- Attributes provided: Mode 1 configuration define to IBM Manufacturing
- Attributes required: Dual IOA Storage Backplane, two SAS ports on rear of server, two Y0 cables, EXP24S drawer in mode1
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
    - Refer to the Software Requirements section to find the supported Linux O/S levels
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#9440) - New AIX License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run AIX.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9441) - New IBM i License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run IBM i.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9442) - New Red Hat License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run Red Hat Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9443) - New SUSE License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run SUSE Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9444) - Other AIX License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of existing AIX licenses transferred from another server.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9445) - Other Linux License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of existing Linux licenses transferred from another server.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9446) - 3rd Party Linux License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run 3rd party Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9447) - VIOS Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run VIOS (Virtual I/O Server).

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9449) - Other License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of other cores licensed.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9450) - Ubuntu Linux License Core Counter

(No longer available as of February 28, 2019)

This feature is used to count the number of cores licensed to run Ubuntu Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9461) - Month Indicator

(No longer available as of February 28, 2019)

This month indicator is used to create a date stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9462) - Day Indicator

(No longer available as of February 28, 2019)

This day indicator is used to create a date stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 31 (Initial order maximum: 31)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9463) - Hour Indicator

(No longer available as of February 28, 2019)

This hour indicator is used to create a time stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9464) - Minute Indicator

(No longer available as of February 28, 2019)

This hour indicator is used to create a time stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 60 (Initial order maximum: 60)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9465) - Qty Indicator

(No longer available as of February 28, 2019)

This quantity indicator is used to specify the remaining, or N-1 quantity of CFR entities that need to be accumulated for rejoining. The quantity ordered for this feature is generated by eConfig. and is equal to N-1, where 'N' equals the total quantity of CFRs being rejoined.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9466) - Countable Member Indicator

(No longer available as of February 28, 2019)

This administrative indicator used to identify each CFR associated with a date/time stamp that is eligible for splitting and rejoining. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9700) - Language Group Specify - Dutch

(No longer available as of February 28, 2019)

Dutch language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9703) - Language Group Specify - French

(No longer available as of February 28, 2019)

French language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9704) - Language Group Specify - German

(No longer available as of February 28, 2019)

German language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9705) - Language Group Specify - Polish

(No longer available as of February 28, 2019)

Polish language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9706) - Language Group Specify - Norwegian

(No longer available as of February 28, 2019)

Norwegian language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9707) - Language Group Specify - Portuguese

(No longer available as of February 28, 2019)

Portuguese language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9708) - Language Group Specify - Spanish

(No longer available as of February 28, 2019)

Spanish language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9711) - Language Group Specify - Italian

(No longer available as of February 28, 2019)

Italian language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9712) - Language Group Specify - Canadian French

(No longer available as of February 28, 2019)

Canadian French language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9714) - Language Group Specify - Japanese

(No longer available as of February 28, 2019)

Japanese language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9715) - Language Group Specify - Traditional Chinese (Taiwan)

(No longer available as of February 28, 2019)

Traditional Chinese language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9716) - Language Group Specify - Korean

(No longer available as of February 28, 2019)

Korean language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9718) - Language Group Specify - Turkish

(No longer available as of February 28, 2019)

Turkish language group for nomenclature and publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9719) - Language Group Specify - Hungarian

(No longer available as of February 28, 2019)

Hungarian language group for Nomenclature and Standard Publications.

- Attributes provided: none
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9720) - Language Group Specify - Slovakian

(No longer available as of February 28, 2019)

Slovakian language group for Nomenclature and Standard Publications.

- Attributes provided: none
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9721) - Language Group Specify - Russian

(No longer available as of February 28, 2019)

Russian language group for nomenclature and standard publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9722) - Language Group Specify - Simplified Chinese (PRC)

(No longer available as of February 28, 2019)

Simplified Chinese language group for nomenclature and standard publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9724) - Language Group Specify - Czech

(No longer available as of February 28, 2019)

Czech language group for nomenclature and standard publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9725) - Language Group Specify -- Romanian

(No longer available as of February 28, 2019)

Romanian language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9726) - Language Group Specify - Croatian

(No longer available as of February 28, 2019)

Croatian language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9727) - Language Group Specify -- Slovenian

(No longer available as of February 28, 2019)

Slovenian language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9728) - Language Group Specify - Brazilian Portuguese

(No longer available as of February 28, 2019)

Brazilian Portuguese language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9729) - Language Group Specify - Thai

(No longer available as of February 28, 2019)

Thai language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#B0LG) - ServicePac Not Selected

(No Longer Available as of February 24, 2016)

ServicePac services not selected for this configuration

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#B0LH) - Service Renewal Requested

(No Longer Available as of February 24, 2016)

Service renewal requested upon expiration

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#B0UQ) - SP WSU 3Y 24x7 SD

ServicePac Warranty Service Upgrade 3 YR 24x7 Same Day ORT 6hrCL/ 4hrPD

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#B0VC) - ServicePac for Basic Selection for Power 3 years

This feature indicates ServicePac for Basic Selection for Power 3 years

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#B0VH) - SP HDR/MR POWER 3Y

ServicePac for Hard Drive or Media Retention for Power 3 years

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EBA5) - HVDC PDU Horizontal Mounting

(No Longer Available as of May 13, 2016)

Specify feature communicates to IBM Manufacturing that a HVDC DPU such as feature #EPAA or feature #EPAE should be horizontally mounted vs vertically mounted. PDU uses 1U rack space when horizontally mounted, but makes accessing power cords much easier than in a side pocket.

- Attributes provided: Manufacturing communication information
- Attributes required: HVDC PDU
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EB27) - QSFP+ 40GBase-SR Transceiver

IBM QSFP+ optical transceiver required for 40 Gbs ports which are not using copper QSFP+ transceiver.

- Attributes provided: QSFP+ transceiver for 40 Gbs ports.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2B) - 1m (3.3-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)

QSFP+ cable is used for 40Gb-to-40Gb Ethernet connectivity. Clients can use this QSFP+ Direct Attach Cable for Ethernet connectivity. This copper cable has QSFP+ transceivers already attached to each end.

- Attributes provided: 1m QSFP+ to QSFP+ Cable
- Attributes required: QSFP/QSFP+ ports
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2H) - 3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)

QSFP+ cable is used for 40Gb-to-40Gb Ethernet connectivity. Clients can use this QSFP+ Direct Attach Cable for Ethernet connectivity. This copper cable has QSFP+ transceivers already attached to each end.

- Attributes provided: 3m QSFP+ to QSFP+ Cable
- Attributes required: QSFP/QSFP+ ports
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2J) - 10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable

QSFP+ cable is used for 40Gb-to-40Gb Ethernet connectivity. Clients can use this QSFP+ Direct Attach Cable for Ethernet connectivity.

- Attributes provided: 10m QSFP+ to QSFP+ Cable
- Attributes required: QSFP/QSFP+ ports with optical transceivers
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2K) - 30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable

QSFP+ cable is used for 40Gb-to-40Gb Ethernet connectivity. Clients can use this QSFP+ Direct Attach Cable for Ethernet connectivity.

- Attributes provided: 30m QSFP+ to QSFP+ Cable
- Attributes required: QSFP/QSFP+ ports with optical transceivers
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2M) - AC Power Supply - 1400W for System Unit (200-240 VAC)

One 200 - 400V, 1400 watt AC power supply.

The power supply is configured in a one plus one or two plus two configuration to provide redundancy. Supported in rack models only.

To be operational, a minimum power supply in the CEC base enclosure is required. If there is a power supply failure, any of the power supplies can be exchanged without interrupting the operation of the system.

This power supply is not supported on all models.

- Attributes provided: AC Power Supply.
- Attributes required: Requires input voltage of 200 - 240 VAC.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB2N) - DC Power Supply - 1400W (180-400V)

(No longer available as of October 19, 2018)

One 180 - 400V, 1400 watt DC power supply.

The power supply is configured in a one plus one or two plus two configuration to provide redundancy. Supported in rack models only.

To be operational, a minimum power supply in the CEC base enclosure is required. If there is a power supply failure, any of the power supplies can be exchanged without interrupting the operation of the system.

This power supply is not supported on all models.

- Attributes provided:
  DC Power Supply.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB3H) - 750 Watt, -48V DC Hot-Swap Power Supply

(No longer available as of February 28, 2019)

This feature provides the option to power the primary power supply or the secondary power supply, providing redundant power, from an industry-standard -48V DC power source. AC and DC power supplies cannot be mixed in a system. A DC power cable is included.

750 Watt, -48V DC Hot-swap Power Supply (#EB3H).

This feature provides the option to power the primary power supply or the secondary power supply, providing redundant power, from an industry-standard -48V DC power source. AC and DC power supplies cannot be mixed in a system.

- Attributes provided: 750 Watt DC Power Supply
- Attributes required: Available Power Supply Bay
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No
  Note: Two power supplies are required

(#EB3Z) - Lift tool based on GenieLift GL-8 (standard)

This feature delivers the Low-Cost Lift Tool (based on GenieLift GL-8 (standard)) for IBM servers.

Feature #EB3Z is a feature that is available on multiple server types (POWER S812L, S822L, S824L, S814, S824, S812, S822, E850C, E850, E880C, E870C, E880, and E870, also the rack models 7965-S42, 7014-T00, and 7014-T42). Failure to have at least one Lift tool available in a location may result in delayed or prolonged maintenance times.

A lift tool raises and lowers servers and I/O drawers so they can be placed into or removed from standard 19-inch racks. It allows heavier equipment to be handled more safely by fewer people. Lift tool feature EB3Z has a hand crank to lift and position up to 181 kg (400 lbs). The lift tool feature EB3Z operating length and width are 88.3 cm x 62.9 cm (34 3/4 x 24 3/4 in). It has rollers which allow it to be moved to different racks in the data center.

- Attributes provided: Lift Tool
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB40) - 0.5M FDR IB / 40GbE Copper Cable QSFP

0.5 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) copper cable transceiver.

Cables are available in various lengths: 0.5M = #EB40, 1M = #EB41, .3M = #EB43, 5M = #EB45 (longer lengths may not be supported for all uses)

See also optical fiber cables for longer lengths such as #EB4A through #EB4G.

- Attributes provided: Copper twinax cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB41) - 1M FDR IB / 40GbE Copper Cable QSFP

1 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) copper cable transceiver.

Cables are available in various lengths: 0.5M = #EB40, 1M = #EB41, .3M = #EB43, 5M = #EB45 (longer lengths may not be supported for all uses)

See also optical fiber cables for longer lengths such as #EB4A through #EB4G.

- Attributes provided: Copper twinax cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB42) - 2M FDR IB / 40GbE Copper Cable QSFP

2 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) copper cable transceiver.

Cables are available in various lengths: 0.5M = #EB40, 1M = #EB41, .3M = #EB43, 5M = #EB45 (longer lengths may not be supported for all uses)

See also optical fiber cables for longer lengths such as #EB4A through #EB4G.

- Attributes provided: Copper twinax cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4A) - 3M FDR IB / 40GbE Optical Cable SFP

3 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4B) - 5M FDR IB / 40GbE Optical Cable QSFP

5 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4C) - 10M FDR IB / 40GbE Optical Cable QSFP

10 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4D) - 15M FDR IB / 40GbE Optical Cable QSFP

15 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB4E) - 20M FDR IB / 40GbE Optical Cable QSFP

20 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4F) - 30M FDR IB / 40GbE Optical Cable QSFP

30 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4G) - 50M FDR IB / 40GbE Optical Cable QSFP

(No longer available as of December 31, 2020)

50 meter length optical fiber cable also called an AOC (Active Optical Cable). The cable can be used for either FDR InfiniBand (IB) or for 40Gb Ethernet adapters or switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP/QFSP+) opticalr cable transceiver.

Cables are available in various lengths: 3m = #EB4A, 5M = #EB4B,

See also copper twinax cables for shorter lengths such as #EB40 through #EB45.

- Attributes provided: Optical fiber cable with QSFP+ transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only used with Solution machine type 5146

(#EB4Z) - Service wedge shelf tool kit for EB3Z

This feature provides a separate tool kit to replace the flat shelf with a wedge/angle shelf at the client site.

Note: EB4Z wedge shelf is IBM SSR use only (due to safety labels/ instructions/certifications only for IBM and not filed for clients). A client can order feature EB4Z to ensure the tool is conveniently located on site in case an IBM SSR needed to use it and do not want to wait for the SSR to locate and bring in an EB4Z or to schedule additional personnel to manually handle server installation/removal from the rack.

Client is free to use EB3Z (without EB4Z) for their normal work.

- Attributes provided: Wedge/angle shelf
- Attributes required: Feature EB3Z
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EB50) - 0.5M EDR IB Copper Cable QSFP28

(No longer available as of January 18, 2019)

0.5 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP28) copper cable transceiver. Cable can also be used for FDR IB (56Gb).

Cables are available in various lengths: 0.5M = #EB50, 1M = #EB51, 2M = #EB52, 1.5M = #EB54 See also optical fiber cables for longer lengths such as #EB5A through #EB5H.

- Attributes provided: Copper twinax cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB51) - 1.0M EDR IB Copper Cable QSFP28

1.0 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP28) copper cable transceiver. Cable can also be used for FDR IB (56Gb).

Cables are available in various lengths: 0.5M = #EB50, 1M = #EB51, 2M = #EB52, 1.5M = #EB54 See also optical fiber cables for longer lengths such as #EB5A through #EB5H.

- Attributes provided: Copper twinax cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB52) - 2.0M EDR IB Copper Cable QSFP28

2.0 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP28) copper cable transceiver. Cable can also be used for FDR IB (56Gb).

Cables are available in various lengths: 0.5M = #EB50, 1M = #EB51, 2M = #EB52, 1.5M = #EB54 See also optical fiber cables for longer lengths such as #EB5A through #EB5H.

- Attributes provided: Copper twinax cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB54) - 1.5M EDR IB Copper Cable QSFP28

1.5 meter length copper twinax cable, also called a DAC (Direct Attached Copper) cable. The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a passive Quad (4-channel) Small Form-Factor Pluggable (QSFP28) copper cable transceiver. Cable can also be used for FDR IB (56Gb).

Cables are available in various lengths: 0.5M = #EB50, 1M = #EB51, 2M = #EB52, 1.5M = #EB54 See also optical fiber cables for longer lengths such as #EB5A through #EB5H.

- Attributes provided: Copper twinax cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB59) - 100Gb Optical Transceiver QSFP28

One optical transceiver for 100Gb Ethernet adapter such as #EC3L or #EC3M using QSFP28. Does not include cable.

See also AOC fiber cables which include QSFP28 transceivers EB5R - EB5Y.

- Attributes provided: Optical Transceiver QSFP28 100Gb.
- Attributes required: Port on adapter with QSFP28 socket.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5A) - 3M EDR IB Optical Cable QSFP28

3 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5B) - 5M EDR IB Optical Cable QSFP28

5 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5C) - 10M EDR IB Optical Cable QSFP28

10 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5D) - 15M EDR IB Optical Cable QSFP28

15 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5E) - 20M EDR IB Optical Cable QSFP28

20 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5F) - 30M EDR IB Optical Cable QSFP28

30 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5G) - 50M EDR IB Optical Cable QSFP28

50 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5H) - 100M EDR IB Optical Cable QSFP28

100 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5J) - 0.5M 100GbE Copper Cable QSFP28

0.5 meter length passive copper cable with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches. Copper cable is also called "copper twinax" or "DAC" (Direct Attach Copper).

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EB5M (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Copper cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5K) - 1.0M 100GbE Copper Cable QSFP28

1.0 meter length passive copper cable with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches. Copper cable is also called "copper twinax" or "DAC" (Direct Attach Copper).

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EB5M (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Copper cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5L) - 1.5M 100GbE Copper Cable QSFP28

1.5 meter length passive copper cable with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches. Copper cable is also called "copper twinax" or "DAC" (Direct Attach Copper).

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EB5M (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Copper cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5M) - 2.0M 100GbE Copper Cable QSFP28

2.0 meter length passive copper cable with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches. Copper cable is also called "copper twinax" or "DAC" (Direct Attach Copper).

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EB5M (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Copper cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5N) - 25M EDR IB Optical Cable QSFP28

(No longer available as of December 31, 2020)

25 meter length optical fiber cable, also called an AOC (Active Optical Cable). The cable can be used for either 100Gb EDR InfiniBand (IB) adapters or IB switches. Built onto each end of the cable is a active Quad (4-channel) Small Form-Factor Pluggable (QSFP28) optical cable transceiver.

Cables are available in various lengths: 3m = #EB5A, 5M = #EB5B, 10M = #EB5C, 15M = #EB5D, 20M = #EB5E, 25M = #EB5N, 30M = #EB5F, and 50M = #EB5G, 100M = #EB5H. See also copper twinax cables for shorter lengths such as #EB50 through #EB54.

Limitation: Adapter and switch must have been manufactured by Mellanox to use this cable. Cable is not supported for FDR IB (56Gb).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5R) - 3M 100GbE Optical Cable QSFP28 (AOC)

3 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5S) - 5M 100GbE Optical Cable QSFP28 (AOC)

5 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5T) - 10M 100GbE Optical Cable QSFP28 (AOC)

10 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5U) - 15M 100GbE Optical Cable QSFP28 (AOC)

15 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5V) - 20M 100GbE Optical Cable QSFP28 (AOC)

20 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5W) - 30M 100GbE Optical Cable QSFP28 (AOC)

30 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5X) - 50M 100GbE Optical Cable QSFP28 (AOC)

50 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB5Y) - 100M 100GbE Optical Cable QSFP28 (AOC)

100 meter length Active Optical fiber Cable (AOC) with QSFP28 tranceivers on each end. The cable used for 100Gb Ethernet adapters or switches.

Cables are available in various lengths. See shorter passive copper cables #EB5J - #EJM (0.5M - 2.0M) or see active optical fiber cables #EJ5R - #EJ5Y (3M - 100M).

- Attributes provided: Optical fiber cable with QSFP28 transceivers
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB72) - IBM i 7.2 Indicator

(No longer available as of April 30, 2020)

This feature is used to indicate the correct level of code when IBM i is specified.

- Attributes provided: IBM i 7.2 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 480 (Initial order maximum: 250)
- OS level required:
  - IBM i 7.2
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB73) - IBM i 7.3 Indicator

This feature is used to indicate the correct level of code when IBM i is specified.

- Attributes provided: IBM i 7.3 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
  - IBM i 7.3 supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EB74) - IBM i 7.4 Indicator

This feature is used to indicate the correct level of code when IBM i is specified.

- Attributes provided: IBM i 7.4 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
  - IBM i 7.4 supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EBC0) - Blockchain on Power

(No longer available as of February 28, 2019)

This indicates tracking feature on Power servers.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EC01) - Rack Front Door (Black)

(No longer available as of December 31, 2020)

This feature provides a front door in flat black color with an IBM logo for the 7953-94X rack. A front door such as #EC01 is required on the 7953-94X. The door is the full width of the rack and the hinges and lockplate can be moved from side to side allowing the door to be opened on the left or on the right. IBM ships rack with the handle on the right and hinges on the left viewed facing the front of the rack. The door comes with a lock which is keyed the same as the rear door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: Front Door with lock
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC02) - Rack Rear Door

(No longer available as of December 31, 2020)

This feature provides a rear door in flat black color for the 7953-94X rack. Either feature number EC02 or feature EC05 is required on the 7953-94X. The door is the full width of the rack and the hinges and lockplate can be moved from side to side allowing the door to be opened on the left or on the right. IBM ships rack with the handle on the right and hinges on the left viewed facing the rear of the rack. The front doors, rear doors and side panels come with a lock which is keyed the same as the front door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: Rear Door with lock
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC03) - Rack Side Cover

(No longer available as of December 31, 2020)

This feature provides two side panels in black color for the 7953-94X rack. Each side panel can cover either the left or the right side of the rack. These side covers are optional but recommended for optimal airflow through a rack and for physical security. The front door, rear doors and side panels come with a lock which is keyed the same as the front door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: Left and Right side panels for 7953 rack.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC04) - Rack Suite Attachment Kit

(No longer available as of December 31, 2020)

This feature provides the attachment hardware to allow two IBM PureFlex System 42U Racks with or without side panels to be bolted together in a continuous suite. Order one EC04 feature for each 42U rack attached to the starting rack. For example, in a three-rack suite, order two EC04 features. When multiple racks are joined in this way without internal side panels, cables can be more easily run between racks without having to exit the continuous rack enclosure. With the side panels installed optimum thermal efficiencies are gained. If the optional rear door heat exchanger is chosen, side panels must remain on racks in the suite. Side panels should be used on the leftmost and rightmost racks of the suite.

- Attributes provided: Hardware and trim to attach two racks
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC07) - Slim Rear Acoustic Door

Slim rear acoustic door for use on the 7014-T42 or server feature #0553 2. 0M racks. Depth of this acoustic door is only about 113 mm (4.45 inches).

Physically #EC07 and #EC08 are identical, but have two feature codes to assist IBM sales configurator logic. #EC07 designates a rear door and #EC08 designates a front door.

- Attributes provided: Rear Acoustic door
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC08) - Slim Front Acoustic Door

Slim front acoustic door for use on the 7014-T42 or server feature #0553 2. 0M racks. Depth of this acoustic door is only about 113 mm (4.45 inches).

Physically #EC07 and #EC08 are identical, but have two feature codes to assist IBM sales configurator logic. #EC07 designates a rear door and #EC08 designates a front door.

- Attributes provided: Acoustic front door
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC15) - Rear Door Heat Exchanger for 2.0 Meter Slim Rack

(No longer available as of December 31, 2020)

This feature indicates that the rear door heat exchanger (1164-95X) is ordered for the 7953-94Y rack. Either feature EC02 or feature EC05 is required on the 7953-94Y.

- Attributes provided: RDHX
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EC27) - PCIe2 LP 2-Port 10GbE RoCE SFP+ Adapter

(No Longer Available as of January 20, 2017)

This PCIe Gen2 adapter provides two 10 Gb copper SFP+ ports and supports the IBTA RoCE standard. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. The adapter can support significantly greater bandwidth with low latency. It minimizes CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBASE-T. Active cables differ from passive cables.

Feature code #EC27 and #EC28 have identical electronics and function and CCIN (EC27), but have different tail stocks. #EC27 is low profile and #EC28 is full high. Compared to Feature #EC29/EC30, the #EC27/EC28 have identical application capability and differ electronically only in that #EC27/EC28 have a SFP+ copper interface and a different CCIN where the #EC29/EC30 have an SFP+ SR optical interface.

LIMITATIONS:

- AIX NIM and Linux Network Install are not supported
- This adapter supports RoCE and NIC functions but not concurrently on same adapters.

Note: As of 3/12/2013 This feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and

- Attributes provided: Dual-port 10GbE Adapter with RoCE capability
- Attributes required: Available GEN2 PCIe Slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#EC28) - PCIe2 2-Port 10GbE RoCE SFP+ Adapter

(No Longer Available as of January 20, 2017)

This PCIe Gen2 adapter provides two 10 Gb copper SFP+ ports and supports the IBTA RoCE standard. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. The adapter can support significantly greater bandwidth with low latency. It minimizes CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBASE-T. Active cables differ from passive cables.

Feature code #EC27 and #EC28 have identical electronics and function and CCIN (EC27), but have different tail stocks. #EC27 is low profile and #EC28 is full high. Compared to Feature #EC29/EC30, the #EC27/EC28 have identical application capability and differ electronically only in that #EC27/EC28 have a SFP+ copper interface and a different CCIN where the #EC29/EC30 have an SFP+ SR optical interface.

LIMITATIONS:

- AIX NIM and Linux Network Install are not supported
- This adapter supports RoCE and NIC functions but not concurrently on same adapters.

Note: As of 3/12/2013 This feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and Abu Dhabi and Yemen.
- Attributes provided: Dual-port 10GbE Adapter with RoCE capability
- Attributes required: Available GEN2 PCIe Slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported; NIC capability only

(#EC29) - PCIe2 LP 2-Port 10GbE RoCE SR Adapter

(No Longer Available as of February 23, 2017)

This PCIe Gen2 adapter provides two 10 Gb SR optical ports and supports the IBTA RoCE standard. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. The adapter can support significantly greater bandwidth with low latency. It minimizes CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The adapter includes a pre-installed Optical Transceiver in the adapter. LC connectors connect to standard 10Gb SR optical cabling and provide up to 300m cable length.

Feature code #EC29 and #EC30 have identical electronics and function and CCIN (EC29), but have different tail stocks. #EC29 is low profile and #EC30 is full high, Compared to Feature #EC27/EC28, the #EC29/EC30 have identical application capability and differ electronically only in that #EC27/ EC28 have a SFP+ copper interface and a different CCIN where the #EC29/EC30 have an SFP+ SR optical interface.

LIMITATIONS:

- AIX NIM and Linux Network Install are not supported
- This adapter supports RoCE and NIC functions but not concurrently on same adapters.

Note: As of 3/12/2013 This feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and Abu Dhabi and Yemen.

- Attributes provided: Dual-port 10GbE Adapter with RoCE capability
- Attributes required:
  - Available GEN2 PCIe Slot
  - Firmware Level 740 or greater
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  VIOS and PowerKVM supported. Refer to Software Requirements for specific code levels supported. VIOS supports NIC capability only.

(#EC2A) - CAPI Activation

This activation feature enables the use of the Coherent Accelerator Processor Interface (CAPI) technology capabilities on POWER8 processor-based Power Systems using industry accelerator technologies. This can increase performance through faster computational efficiency and by requiring fewer resources to accomplish tasks through direct integration of workload accelerator(s) in the system. When using this optional feature (#EC2A) one is required per server. The CAPI activation feature is generic and can be used with separately provided CAPI application or hardware from IBM or OEM.

- Attributes provided: activation/enablement
- Attributes required: None for enablement, but use of CAPI will also require CAPI-aware hardware and applications
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: One per socket not to exceed two

(#EC2G) - PCIe2 LP 2-port 10GbE SFN6122F Adapter

(No Longer Available as of January 20, 2017)

This PCIe Gen2 2-port 10Gb Ethernet adapter is manufactured by SolarFlare and supports their OpenOnload(R) application accelerator. The adapter is supported by Linux and can be used by user-provided applications written to leverage its interfaces.

This PCIe Gen2 adapter provides two 10 Gb copper SFP+ ports. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. #EN01/EN02/EN03 cables include transceivers for SFP+ ports. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBASE-T. Active cables differ from passive cables

#EC2G and #EC2J are electronically identical adapters, but #EC2G indicates a low profile tail stock and #EC2J indicates a full high tail stock.

See also #EC2H and #EC2K which is also manufactured by SolarFlare, but does not support the OpenOnload capability.

- Attributes provided: PCIe Gen2 adapter with 2 10Gb Ethernet ports which supports Solaflare OpenOnload
- Attributes required: Available low profile PCIe2 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC2J) - PCIe2 2-port 10GbE SFN6122F Adapter

(No Longer Available as of January 20, 2017)

This PCIe Gen2 2-port 10Gb Ethernet adapter is manufactured by SolarFlare and supports their OpenOnload(R) application accelerator. The adapter is supported by Linux and can be used by user-provided applications written to leverage its interfaces.

This PCIe Gen2 adapter provides two 10 Gb copper SFP+ ports. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. #EN01/EN02/EN03 cables include transceivers for SFP+ ports. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBASE-T. Active cables differ from passive cables

#EC2G and #EC2J are electronically identical adapters, but #EC2G indicates a low profile tail stock and #EC2J indicates a full high tail stock.

- Attributes provided: PCIe Gen2 adapter with 2 10Gb Ethernet ports which supports Solaflare OpenOnload
- Attributes required: Available full high PCIe2 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC2M) - PCIe3 LP 2-port 10GbE NIC&RoCE SR Adapter

(No longer available as of December 31, 2020)

This PCIe Gen3 adapter provides two 10 Gb SR optical fiber ports. The adapter supports both NIC and IBTA RoCE standards. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. Using RoCE, the adapter can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The adapter includes two pre-installed Optical Transceivers in the adapter. LC connectors connect to standard 10Gb SR optical cabling and provide up to 300m cable length.

Feature code #EC2M and #EC2N have identical electronics and function and CCIN (57BE), but have different tail stocks. #EC2M is low profile and #EC2N is full high. Compared to EC37/EC38, the EC2M/ EC2N have identical application capability, but different cabling (optical fiber vs copper twinax). The EC2M/EC2N is based on the Mellanox ConnectX-3 Pro ASIC and is newer technology than previous features EC29/EC30.

LIMITATION: This adapter supports RoCE and NIC functions but not concurrently on same adapter.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IBTA RoCE v2 support.
- IEEE 802.3ae (10Gb Ethernet), IEEE 802.3ad (Link Aggregation & Failover), IEEE 802.3az (Energy Efficient Ethernet), IEEE 802.1Q/P (VLAN Tagging), IEEE 802.10au (Congestion Notification), IEEE 802.1Qbg, IEEE 802.3Qaz D0.2 (ETS), IEEE 802.1Qbb D1.0 (PFC), IEEE 1588v2 (PTP)
- Jumbo frame support up to 9.6KB
- VXLAN and NVGRE Overlay Network offload support
- TCP/UDP/IP stateless offload
- TCP checksum offload
- TCP segmentation offload
- UDP checksum offload
- MSI-X, MSI and support of legacy pin interrup
- Attributes provided: 2-port 10Gb Ethernet Adapter with NIC and/or RoCE capability
- Attributes required: PCIe Gen3 or Gen2 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later
  - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
  - IBM i 7.1 TR11 and IBM i 7.2 TR3 or later supported only with VIOS. Only virtual ethernet NIC supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later. VIOS supports NIC capability only.

(#EC2N) - PCIe3 2-port 10GbE NIC&RoCE SR Adapter

(No longer available as of December 31, 2020)

This PCIe Gen3 adapter provides two 10 Gb SR optical fiber ports. The adapter supports both NIC and IBTA RoCE standards. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. Using RoCE, the adapter can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The adapter includes two pre-installed Optical Transceivers in the adapter. LC connectors connect to standard 10Gb SR optical cabling and provide up to 300m cable length.

Feature code #EC2M and #EC2N have identical electronics and function and CCIN (57BE), but have different tail stocks. #EC2M is low profile and #EC2N is full high. Compared to EC37/EC38, the EC2M/ EC2N have identical application capability, but different cabling (optical fiber vs copper twinax). The EC2M/EC2N is based on the Mellanox ConnectX-3 Pro ASIC and is newer technology than previous features EC29/EC30.

LIMITATION: This adapter supports RoCE and NIC functions but not concurrently on same adapter.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IBTA RoCE v2 support.
- IEEE 802.3ae (10Gb Ethernet), IEEE 802.3ad (Link Aggregation & Failover), IEEE 802.3az (Energy Efficient Ethernet), IEEE 802.1Q/P (VLAN Tagging), IEEE 802.10au (Congestion Notification), IEEE 802.1Qbg, IEEE 802.3Qaz D0.2 (ETS), IEEE 802.1Qbb D1.0 (PFC), IEEE 1588v2 (PTP)
- Jumbo frame support up to 9.6KB
- VXLAN and NVGRE Overlay Network offload support
- TCP/UDP/IP stateless offload
- TCP checksum offload
- TCP segmentation offload
- UDP checksum offload
- MSI-X, MSI and support of legacy pin interrup
- Attributes provided: 2-port 10Gb Ethernet Adapter with NIC and/or RoCE capability
- Attributes required: PCIe Gen3 or Gen2 slot
- Minimum required: 0
- Maximum allowed: 13 (Initial order maximum: 13)
- OS level required:
    - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later (planned availability 9/30/2015)
    - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later (planned availability 9/30/2015)
    - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
    - Red Hat Enterprise Linux 6.6, or later
    - Red Hat Enterprise Linux 7.1, big endian, or later
    - Red Hat Enterprise Linux 7.1, little endian, or later
    - SUSE Linux Enterprise Server 12, or later
    - Ubuntu 15.04, or later
    - IBM i 7.1 TR1 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later. VIOS supports NIC capability only.

(#EC30) - PCIe2 2-Port 10GbE RoCE SR Adapter

(No Longer Available as of January 20, 2017)

This PCIe Gen2 adapter provides two 10 Gb SR optical ports and supports the IBTA RoCE standard. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. The adapter can support significantly greater bandwidth with low latency. It minimizes CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The adapter includes a pre-installed Optical Transceiver in the adapter. LC connectors connect to standard 10Gb SR optical cabling and provide up to 300m cable length.

Feature code #EC29 and #EC30 have identical electronics and function and CCIN (EC29), but have different tail stocks. #EC29 is low profile and #EC30 is full high, Compared to Feature #EC27/EC28, the #EC29/EC30 have identical application capability and differ electronically only in that #EC27/EC28 have a SFP+ copper interface and a different CCIN where the #EC29/EC30 have an SFP+ SR optical interface.

- Attributes provided: Dual-port 10GbE Adapter with RoCE capability
- Attributes required:
    - Available GEN2 PCIe Slot
    - Firmware Level 740 or greater
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- LIMITATIONS:
    - AIX NIM and Linux Network Install are not supported
    - This adapter supports RoCE and NIC functions but not concurrently on same adapters.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: As of 3/12/2013 This feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and Abu Dhabi and Yemen.
  Note: VIOS supported; NIC capability only

(#EC32) - PCIe3 LP 2-port 56Gb FDR IB Adapter x16

The PCIe Gen3 low profile x16 2-port Infiniband FDR adapter provides high speed connectivity with other servers or IB switches. Each port maximum of 56Gb assumes no other system and/or switch bottlenecks are present. The x16 adapter allows full bandwidth in a PCIe Gen3 slot. This adapter is sourced from Mellanox Corporation. CCIN is 2CE7.

The two 56Gb ports have QSFP+ connections which support industry standard FDR cables, either FDR DAC cables or FDR optical. One adapter can support either or both types of cable. The user can choose to cable up just one port if they desire.

The #EC32 and EC33 adapters are electronically and physically identical except they have different tail stocks to support different height PCIe slots.

Limitation: This adapter does not fit in a x8 PCIe slot.

Limitation: Not supported by VIOS

- Attributes provided: 2-Port 56Gb FDR Adapter
- Attributes required: Low profile x16 PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - not supported
  - IBM i - not supported
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC37) - PCIe3 LP 2-port 10GbE NIC&RoCE SFP+ Copper Adapter

(No longer available as of December 31, 2020)

This PCIe Gen3 adapter provides two 10 Gb SFP+ ports for copper twinax cabling/transceivers. The adapter supports both NIC and IBTA RoCE standards.. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. Using RoCE, the adapter can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. These cables also include copper transceivers. Active cables differ from passive cables.

Feature code #EC37 and #EC38 have identical electronics and function and CCIN (57BC), but have different tail stocks. #EC37 is low profile and #EC38 is full high. Compared to EC2M/EC2N, the EC37/ EC38 have identical application capability, but different cabling (optical fiber vs copper twinax). The EC37/EC38 is based on the Mellanox ConnectX-3 Pro ASIC and is newer technology than previous features EC27/EC28.

LIMITATION: This adapter supports RoCE and NIC functions but not concurrently on same adapter.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IBTA RoCE v2 support.
- IEEE 802.3ae (10Gb Ethernet), IEEE 802.3ad (Link Aggregation & Failover), IEEE 802.3az (Energy Efficient Ethernet), IEEE 802.1Q/P (VLAN Tagging), IEEE 802.10au (Congestion Notification), IEEE 802.1Qbg, IEEE 802.3Qaz D0.2 (ETS), IEEE 802.1Qbb D1.0 (PFC), IEEE 1588v2 (PTP)
- Jumbo frame support up to 9.6KB
- VXLAN and NVGRE Overlay Network offload support
- TCP/UDP/IP stateless offload
- TCP checksum offload
- TCP segmentation offload
- UDP checksum offload
- MSI-X, MSI and support of legacy pin interrup
- Attributes provided: 2-port 10Gb Ethernet Adapter with NIC and/or RoCE capability
- Attributes required: PCIe Gen3 or Gen2 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later (planned availability 9/30/2015)
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later (planned availability 9/30/2015)
  - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later. VIOS supports NIC capability only.

(#EC38) - PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter

(No longer available as of April 24, 2020)

This PCIe Gen3 adapter provides two 10 Gb SFP+ ports for copper twinax cabling/transceivers. The adapter supports both NIC and IBTA RoCE standards. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. Using RoCE, the adapter can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. These cables also include copper transceivers. Active cables differ from passive cables.

Feature code #EC37 and #EC38 have identical electronics and function and CCIN (57BC), but have different tail stocks. #EC37 is low profile and #EC38 is full high. Compared to EC2M/EC2N, the EC37/ EC38 have identical application capability, but different cabling (optical fiber vs copper twinax). The EC37/EC38 is based on the Mellanox ConnectX-3 Pro ASIC and is newer technology than previous features EC27/EC28.

LIMITATION: This adapter supports RoCE and NIC functions but not concurrently on same adapter.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IBTA RoCE v2 support.
- IEEE 802.3ae (10Gb Ethernet), IEEE 802.3ad (Link Aggregation & Failover), IEEE 802.3az (Energy Efficient Ethernet), IEEE 802.1Q/P (VLAN Tagging), IEEE 802.10au (Congestion Notification), IEEE 802.1Qbg, IEEE 802.3Qaz D0.2 (ETS), IEEE 802.1Qbb D1.0 (PFC), IEEE 1588v2 (PTP)
- Jumbo frame support up to 9.6KB
- VXLAN and NVGRE Overlay Network offload support
- TCP/UDP/IP stateless offload
- TCP checksum offload
- TCP segmentation offload
- UDP checksum offload
- MSI-X, MSI and support of legacy pin interrup
- Attributes provided: 2-port 10Gb Ethernet Adapter with NIC and/or RoCE capability
- Attributes required: PCIe Gen3 or Gen2 slot
- Minimum required: 0
- Maximum allowed: 13 (Initial order maximum: 13)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later (planned availability 9/30/2015)
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later (planned availability 9/30/2015)
  - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later. VIOS supports NIC capability only.

(#EC3A) - PCIe3 LP 2-Port 40GbE NIC RoCE QSFP+ Adapter

(No longer available as of April 24, 2020)

PCIe Gen3 adapter provides two 40 Gb Ethernet QSFP+ ports. NIC and IBTA RoCE protocols are supported.

RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. RoCE can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The #EC3A/EC3B adapter does not include transceivers. Shorter distance copper cables include transceivers on the end of the QSFP+ cable (see #EB2B (1m), #EB2H (3m), #ECBN (5m)). For longer distance use two optical SR transceiver (two #EB27). QSFP+ optical cables to be used with the #EB27 transceiver are #EB2J (10m) or #EB2K (30m). Do not mix copper and optical on the same adapter.

Feature code #EC3A and #EC3B have identical electronics and function and the same CCIN (57BD), but they have different tail stocks. #EC3A is low profile and #EC3B is full height.

AIX NIM and Linux Network Install are supported.

Limitation: As of April 2014, this feature is not available in the following EMEA countries, Bahrain, Comoros, Djibouti, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Tunisia and United Arab Emirates which includes IBM Middle East - Dubai and Abu Dhabi and Yemen.

- Attributes provided: 2-Port 40GbE NIC and RoCE (no transceiver)
- Attributes required: PCIe Gen2 or Gen3 slot (Gen3 preferred); Two Transceivers; QSFP+ cabling
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: VIOS supports NIC capability only. Refer to Software Requirements for specific code levels supported.

(#EC3B) - PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter

(No longer available as of December 31, 2020)

PCIe Gen3 adapter provides two 40 Gb Ethernet QSFP+ ports. NIC and IBTA RoCE protocols are supported.

RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. RoCE can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

The #EC3A/EC3B adapter does not include transceivers. Shorter distance copper cables include transceivers on the end of the QSFP+ cable (see #EB2B (1m), #EB2H (3m), #ECBN (5m)). For longer distance use two optical SR transceiver (two #EB27). QSFP+ optical cables to be used with the #EB27 transceiver are #EB2J (10m) or #EB2K (30m). Do not mix copper and optical on the same adapter.

Feature code #EC3A and #EC3B have identical electronics and function and the same CCIN (57BD), but they have different tail stocks. #EC3A is low profile and #EC3B is full height.

AIX NIM and Linux Network Install are supported.

- Attributes provided: 2-Port 40GbE NIC and RoCE (no transceiver)
- Attributes required: PCIe Gen2 or Gen3 slot (Gen3 preferred). Two Transceivers; QSFP+ cabling
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported; NIC capability only

(#EC3E) - PCIe3 LP 2-port 100Gb EDR IB Adapter x16

(No longer available as of December 31, 2020)

The PCIe Gen3 x16 2-port InfiniBand EDR adapter provides high speed connectivity with other servers or IB switches. Each port maximum of 100Gb assumes no other system and/or switch bottlenecks are present. A PCIe Gen3 x16 PCIe slot is required. This adapter is sourced from Mellanox Corporation. The two 100Gb ports have QSFP+ connections which support EDR cables, either EDR DAC or EDR optical. One adapter can support either or both types of cable. The user can choose to cable up just one port if they desire. #EC3E and #EC3F adapters are electronically and functionally identical with the same CCIN of 2CEA. #EC3E has a low profile tailstock bracket. Limitation: Adapter does not fit in x8 PCIe slot.

Limitation: Not supported by VIOS

- Attributes provided: EDR InfiniBand PCIe Adapter
- Attributes required: available x16 PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i not supported
  - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later, with Mellanox OFED 3.2, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later, with Mellanox OFED 3.2, or later
  - Ubuntu 14.04.4, or later, with Mellanox OFED 3.2, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later, with Mellanox OFED 3.2, or later
  - SUSE Linux Enterprise Server 12, Service Pack 1, or later, with Mellanox OFED 3.2, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC3L) - PCIe3 LP 2-port 100GbE (NIC& RoCE) QSFP28 Adapter x16

This PCIe Gen3 Ethernet x16 adapter provides two 100 Gb QSFP28 ports. The adapter supports both NIC and IBTA RoCE standards. RoCE is Remote Direct Memory Access (RDMA) over Converged Ethernet. Using RoCE, the adapter can support significantly greater bandwidth with low latency and minimize CPU overhead by more efficiently using memory access. This offloads the CPU from I/O networking tasks, improving performance and scalability.

IBM offers either passive copper twinax cables up to 2 meter in length or active optical cables up to 100 meters in length. See features #EB5J - #EB5M for a 0.5M, 1.0M, 1.5M and 2.0M copper cable. See features #EB5R - #EB5Y for a 3M, 5M, 10M, 15M, 20M, 30M, 50M or 100M active optical cable. Transceivers are included on each end of these QSFP28 cables. Alternatively to the above supported cables, you may chose to order an IBM qualified and supported QSFP28 optical transceiver (feature #EB59) to put into the adapter and provide your own 100GE optical cabling with your own QSP28 optical transceiver for the other end.

Either one or both of the adapter's two QSP28 ports can be populated. When two ports are filled, both can have copper cables, both can have optical cables, or one can be copper and one can be optical.

Feature code #EC3L and #EC3M have identical electronics and function and CCIN (2CEC), but have different tail stock brackets. #EC3L is low profile and #EC3M is full high. The adapter is based on a Mellanox ConnectX-4 adapter which uses a ConnectX-4 EN Network Controller. Attributes :

- PCI Express 3.0 (up to 8GT/s) x16
- PCIe Gen 3.0 compliant, 1.1 and 2.0 compatible
- RDMA over Converged Ethernet (RoCE)
- NIC and RoCE are concurrently supported
- RoCE supported on Linux and AIX (7.2 and later)
- NIC supported on all OSes
- TCP/UDP/IP stateless offload
- LSO, LRO, checksum offload
- SRIOV support enable on UbuntuKVM, supports only Ubuntu Guest - NIM boot support - Backward compatible with 40Gb Ethernet when using compatible cables/transceivers.
- Attributes provided: 2-port 100Gb Ethernet
- Attributes required: x16 PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - AIX Version 7.2 with the 7200-01 Technology Level, or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 3 and APAR IV88680, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 8 and APAR IV88679, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 8, or later (planned availability 1/27/2017)
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 3, or later (planned availability 1/27/2017)
  - IBM i supported only with VIOS

  Note: AIX 7.2 with the 7200-01 Technology level or later supports both Ethernet and RoCE capability. AIX 6.1, 7.1 and VIOS support Ethernet capability only.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.5.10, or later. VIOS supports NIC capability only.

(#EC3T) - PCIe3 LP 1-port 100Gb EDR IB Adapter x16

The PCIe Gen3 x16 1-port InfiniBand EDR adapter provides high speed connectivity with other servers or IB switches. The port's maximum of 100Gb assumes no other system and/or switch bottlenecks are present. A PCIe Gen3 x16 PCIe slot is required. This adapter is sourced from Mellanox Corporation. The 100Gb port has a QSFP+ connection which supports EDR cables, either EDR DAC or EDR optical. #EC3T and #EC3U adapters are electronically and functionally identical with the same CCIN of 2CEB. #EC3T has a low profile tailstock bracket.

Limitation: Adapter does not fit in x8 PCIe slot.

Limitation: Not supported by VIOS

- Attributes provided: EDR InfiniBand PCIe Adapter
- Attributes required: available x16 PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i not supported
  - Red Hat Enterprise Linux 8 for Power, or later, with Mellanox OFED 4.6, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later, with Mellanox OFED 3.2, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later, with Mellanox OFED 3.2, or later
  - Ubuntu 14.04.4, or later, with Mellanox OFED 3.2, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later, with Mellanox OFED 3.2, or later
  - SUSE Linux Enterprise Server 12, Service Pack 1, or later, with Mellanox OFED 3.2, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC41) - PCIe2 LP 3D Graphics Adapter x1

There are two identical 3D adapters EC41 with a low profile tail stock and EC42 with full high tail stock.

When using graphic adapter for Partition Firmware Console to select an install or boot device use #3632 display or rack mount 7316-TF4 display. Withdrawn display #3644 or withdrawn rack mount 7316-TF3 display may also be used.

Limit of one adapter per LPAR.

Limitation: Placement of this PCIe adapter is not supported in the PCIe Gen3 I/O Drawer.

- Attributes provided: Graphics adapter with DMS-59 Dual DVI cable
- Attributes required: available PCIe2 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - AIX - not supported
    - IBM i - not supported
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 7, for POWER, or later
    - Users should also update their systems with the latest Linux for POWER service and productivity tools from the IBM website
    - http://www14.software.ibm.com/webapp/set2/sas/f/lopdi ags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC45) - PCIe2 LP 4-Port USB 3.0 Adapter

(No longer available as of December 31, 2020)

The PCIe Gen2 x8 short 4-port USB 3.0 adapter provides support for USB devices. In applications that require the use of an USB extension cable for keyboards, use one #4256 per port. The #EC45 and #EC46 USB adapters are electronically identical with the same 58F9 CCIN. They differ physically in their tailstock. #EC45 is low profile and #EC46 is full high.

- Attributes provided: Connectivity with USB 2.0 - 3.0 capable devices
- Attributes required: One low profile available PCIe slot.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supports NIC capability only.

(#EC46) - PCIe2 4-Port USB 3.0 Adapter

(No longer available as of December 31, 2020)

The PCIe Gen2 x8 short 4-port USB 3.0 adapter provides support for USB devices. In applications that require the use of an USB extension cable for keyboards, use one #4256 per port. The #EC45 and #EC46 USB adapters are electroncially identical with the same 58F9 CCIN. They differ physically in their tailstock. #EC45 is low profile and #EC46 is full high.

- Attributes provided: Connectivity with USB 2.0 - 3.0 capable devices
- Attributes required: One available full height PCIe slot.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC51) - PCIe3 LP 3D Graphics Adapter x16

(No longer available as of March 24, 2020)

When using graphic adapter for Partition Firmware Console to select an install or boot device use FC 3632 display or rack mount 7316-TF4 display. Withdrawn display FC 3644 or withdrawn rack mount 7316-TF3 display may also be used.

Limit of one adapter per LPAR.

- Attributes provided: Provides 2x DISPLAY port outputs
- Attributes required: Available PCIe2 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 7.3, little endian, or later
  - Red Hat Enterprise Linux 7.3, big endian, or later
  - SUSE Linux Enterprise Server 12, Service Pack 2, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Placement of this PCIe adapter is not supported in the PCIe Gen3 I/O Drawer.

(#EC54) - PCIe3 LP 1.6TB NVMe Flash Adapter

(No longer available as of August 7, 2020)

This feature ships 1.6 TB of low write latency, nonvolatile flash memory on a PCIe Gen3 adapter. Adapter uses NVMe (Non-Volatile Memory express) which is a high performance software interface to read/write this flash memory. Adapter physically is half length x4 adapter which can be used in either a x8 or x16 PCIe Gen3 slot in the system unit. Compared to SAS/SATA SSD the NVMe adapter can provide significantly more read or write IOPS and significantly larger throughput (GB/sec). CCIN is 58CB. Adapter card is designed for read intensive workloads with light write activity. Approximately 8,760 TB of data can be written over the life of the adapter, but depending on the nature of the workload may be somewhat larger. After the warranty period, if the maximum write capability is achieved, the adapter's replacement is not covered under IBM maintenance. For high value applications where the content in the adapter must be protected, using additional NVMe Flash adapter(s) with OS mirroring or software RAID is recommended. #EC54 and #EC55 are identical cards except that the tailstock bracket is different. #EC54 fits a low profile PCIe slot. #EC55 fits a full high PCIe slot. See also #EC56/EC57 for a card with more memory. Limitations: Not supported in PCIe Gen3 I/O drawer. Data protection not implemented in the card and protection provided by OS mirroring or software RAID.

- Attributes provided: 1.6 TB of low latency flash memory
- Attributes required: PCIe Gen3 slot in system unit
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required:
  - IBM i not supported
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later, with all available maintenance updates
  - Red Hat Enterprise Linux 7.2, little endian, or later, with all available maintenance updates
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later, with all available maintenance updates
  - Ubuntu Server 16.04, or later
  The nvme-cli tool is available for download for RHEL and SLES from the IBM Power Tools repository:

  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC56) - PCIe3 LP 3.2TB NVMe Flash Adapter

(No longer available as of August 7, 2020)

This feature ships 3.2 TB of write low latency, nonvolatile flash memory on a PCIe Gen3 adapter. Adapter uses NVMe (Non-Volatile Memory express) which is a high performance software interface to read/write this flash memory. Adapter physically is half length x4 adapter which can be used in either a x8 or x16 PCIe Gen3 slot in the system unit. Compared to SAS/SATA SSD the NVMe adapter can provide significantly more read or write IOPS and significantly larger throughput (GB/sec). CCIN is 58CC. Adapter card is designed for read intensive workloads with light write activity. Approximately 17,500 TB of data can be written over the life of the adapter, but depending on the nature of the workload may be somewhat larger. After the warranty period, if the maximum write capability is achieved, the adapter's replacement is not covered under IBM maintenance. For high value applications where the content in the adapter must be protected, using additional NVMe Flash adapter(s) with OS mirroring or software RAID is recommended. #EC56 and #EC57 are identical cards except that the tailstock bracket is different. #EC56 fits a low profile PCIe slot. #EC57 fits a full high PCIe slot. See also #EC54/EC55 for a card with less memory. Limitations: Not supported in PCIe Gen3 I/O drawer. Data protection not implemented in the card and protection provided by OS mirroring or software RAID.

- Attributes provided: 3.2 TB low latency flash memory
- Attributes required: PCIe Gen3 slot in system unit
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required:
  - IBM i not supported
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later, with all available maintenance updates
  - Red Hat Enterprise Linux 7.2, little endian, or later, with all available maintenance updates
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later, with all available maintenance updates
  - Ubuntu Server 16.04, or later
  The nvme-cli tool is available for download for RHEL and SLES from the IBM Power Tools repository:

  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBJ) - SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure

This 3 meter SAS cable connects two PCIe2 SAS adapters or two PCIe3 SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connectors attach to two SAS adapters such as two #EJ0J or two #EJ0L or two #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

This cable is almost identical to the #3454 3m SAS X cable, except #ECBJ connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBK) - SAS X Cable 6m - HD Narrow 6Gb 2-Adapters to Enclosure

This 3 meter SAS cable connects two PCIe2 SAS adapters or two PCIe3 SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connectors attach to two SAS adapters such as two #EJ0J or two #EJ0L or two #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

This cable is almost identical to the #3454 3m SAS X cable, except #ECBJ connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

This 6 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) connector and two Mini SAS connectors. The Mini-SAS HD connectors attaches to two SAS adapters such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

- Limitation: When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBL) - SAS X Cable 10m - HD Narrow 6Gb 2-Adapters to Enclosure

(No longer available as of December 31, 2020)

This 3 meter SAS cable connects two PCIe2 SAS adapters or two PCIe3 SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connectors attach to two SAS adapters such as two #EJ0J or two #EJ0L or two #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

This cable is almost identical to the #3454 3m SAS X cable, except #ECBJ connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Limitation: When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBM) - SAS X Cable 15m - HD Narrow 3Gb 2-Adapters to Enclosure

This 15 meter SAS cable connects two PCIe2 SAS adapters or two PCIe3 SAS adapters to a SAS I/O enclosure. This X cable has four connectors, two Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connectors attach to two SAS adapters such as two #EJ0J or two #EJ0L or two #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

This cable is almost identical to the #3458 15m SAS X cable, except #ECBM connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Limitation: When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBN) - 5m (16.4-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)

(No longer available as of January 18, 2019)

QSFP+ cable is used for 40Gb-to-40Gb Ethernet connectivity. clients can use this QSFP+ Direct Attach Cable for Ethernet connectivity. This copper cable has QSFP+ transceivers already attached to each end.

- Attributes provided: 5m QSFP+ to QSFP+ Cable
- Attributes required: QSFP/QSFP+ ports
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBT) - SAS YO Cable 1.5m - HD Narrow 6Gb Adapter to Enclosure

This 1.5 meter SAS cable connects a PCIe2 SAS adapter or a PCIe3 SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0J or #EJ0L or #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable.

This cable is almost identical to the #3450 1.5m SAS YO cable, except the #ECBT connector for the SAS adapters is more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBU) - SAS YO Cable 3m - HD Narrow 6Gb Adapter to Enclosure

This 3 meter SAS cable connects a PCIe2 SAS adapter or a PCIe3 SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0J or #EJ0L or #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable.

This cable is almost identical to the #3451 3m SAS YO cable, except the #ECBU connector for the SAS adapters is more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.

- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBV) - SAS YO Cable 6m - HD Narrow 6Gb Adapter to Enclosure

This 6 meter SAS cable connects a PCIe2 SAS adapter or a PCIe3 SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0J or #EJ0L or #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable.

This cable is almost identical to the #3452 6m SAS YO cable, except the #ECBV connector for the SAS adapters is more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Limitation: When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBW) - SAS YO Cable 10m - HD Narrow 6Gb Adapter to Enclosure

This 10 meter SAS cable connects a PCIe2 SAS adapter or a PCIe3 SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0J or #EJ0L or #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5886 EXP12S or #5887 EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable.

This cable is almost identical to the #3453 10m SAS YO cable, except the #ECBW connector for the SAS adapters is more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Limitation: When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.
- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBX) - SAS YO Cable 15m - HD Narrow 3Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This 15 meter SAS cable connects a PCIe2 SAS adapter or a PCIe3 SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0J or #EJ0L or #5913. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887 EXP24S SAS I/O drawer. This cable can support up to 3Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/O drawer. See SAS cabling documentation for the length of each leg of the cable.

This cable is almost identical to the #3457 15m SAS YO cable, except the #ECBX connector for the SAS adapters is more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Limitation:
  - Does not support 6Gb throughput.
  - When this cable is ordered with a system in a rack specifying IBM Plant integration, IBM Manufacturing will ship SAS cables longer than 3 meters in a separate box and not attempt to place the cable in the rack.
- Attributes provided: Connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS I/O drawer with Mini-SAS connectors or between PCIe2 SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini-SAS connectors.

- Attributes required: available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBY) - SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure

This 4 meter SAS cable connects a PCIe3 SAS adapter to a SAS tape drive. The tape drive is probably in an I/O enclosure such as a bridge box or 1U media enclosure or tape library. This AE cable has two connectors, one Mini-SAS HD (High Density) Narrow connector and one Mini-SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0X. The Mini-SAS connector attaches to a SAS tape drive enclosure. This cable can support up to 6Gb throughput.

Use #ECBY when ordering the cable as a feature code on a Power System. Alternatively the same cable can be ordered using feature code #5507 of the IBM tape enclosure.

- Attributes provided: connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS tape drive with Mini-SAS connectors
- Attributes Required: Available connectors on SAS controller such as #EJ0X, #EJ10 or #EJ11 and an available SAS tape drive.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECBZ) - SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure

This 3 meter SAS cable connects a PCIe3 SAS adapter to one or two SAS tape drives. The tape drive(s) is probably in an I/O enclosure such as a bridge box or 1U media enclosure or tape library. This YO cable has three connectors, one Mini-SAS HD (High Density) Narrow connector and two Mini-SAS connectors. The Mini-SAS HD Narrow connector attaches to a SAS adapter such as the #EJ0X. Each Mini-SAS connector attaches to a different SAS tape drive enclosure. This cable can support up to 6Gb throughput.

Use #ECBZ when ordering the cable as a feature code on a Power System. Alternatively the same cable can be ordered using feature code #5509 of the IBM tape enclosure.

- Attributes provided: connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and one or two SAS tape drives with Mini-SAS connectors.
- Attributes required: Available connectors on SAS controller such as #EJ0X, #EJ10 or #EJ11 for use with an available SAS tape drive.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC0) - SAS AA Cable 0.6m - HD Narrow 6Gb Adapter to Adapter

This 0.6m SAS cable connects a pair of PCIe SAS adapters with write cache to each other. The pair can be two PCIe3 SAS adapters or can be two PCIe2 SAS adapters. This AA cable has two Mini-SAS HD (High Density) Narrow connectors which connect the top connectors of the two PCIe adapters providing a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache such as #EJ0L unless six (three pair) of ports or unless eight (four pair) are used to attach I/O drawers. One AA cable is always required between a pair of PCIe2 SAS adapters with write cache (pair of #5913 or a pair of #ESA3) unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/ O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. p.This cable is almost identical to the #5918 0.6m SAS AA cable, except #ECC0 connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: high speed connection between two PCIe2 or two PCIe3 SAS adapters with write cache
- Attributes required: available top connectors on pair of PCIe2 or PCIe3 SAS adapters with write cache
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC2) - SAS AA Cable 1.5m - HD Narrow 6Gb Adapter to Adapter

This 1.5m SAS cable connects a pair of PCIe SAS adapters with write cache to each other. The pair can be two PCIe3 SAS adapters or can be two PCIe2 SAS adapters. This AA cable has two Mini-SAS HD (High Density) Narrow connectors which connect the top connectors of the two PCIe adapters providing a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache such as #EJ0L unless six (three pair) of ports or unless eight (four pair) are used to attach I/O drawers. One AA cable is always required between a pair of PCIe2 SAS adapters with write cache (pair of #5913 or a pair of #ESA3) unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/ O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. p.This cable is almost identical to the #5917 1.5m SAS AA cable, except #ECC2 connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: high speed connection between two PCIe2 or two PCIe3 SAS adapters with write cache
- Attributes required: available top connectors on pair of PCIe2 or PCIe3 SAS adapters with write cache
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC3) - SAS AA Cable 3m - HD Narrow 6Gb Adapter to Adapter

This 3m SAS cable connects a pair of PCIe SAS adapters with write cache to each other. The pair can be two PCIe3 SAS adapters or can be two PCIe2 SAS adapters. This AA cable has two Mini-SAS HD (High Density) Narrow connectors which connect the top connectors of the two PCIe adapters providing a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache such as #EJ0L unless six (three pair) of ports or unless eight (four pair) are used to attach I/O drawers. One AA cable is always required between a pair of PCIe2 SAS adapters with write cache (pair of #5913 or a pair of #ESA3) unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/ O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. p.This cable is almost identical to the #5915 3m SAS AA cable, except #ECC3 connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: high speed connection between two PCIe2 or two PCIe3 SAS adapters with write cache
- Attributes required: available top connectors on pair of PCIe2 or PCIe3 SAS adapters with write cache
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC4) - SAS AA Cable 6m - HD Narrow 6Gb Adapter to Adapter

(No longer available as of December 31, 2020)

This 6m SAS cable connects a pair of PCIe SAS adapters with write cache to each other. The pair can be two PCIe3 SAS adapters or can be two PCIe2 SAS adapters. This AA cable has two Mini-SAS HD (High Density) Narrow connectors which connect the top connectors of the two PCIe adapters providing a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable can support up to 6Gb throughput.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache such as #EJ0L unless six (three pair) of ports or unless eight (four pair) are used to attach I/O drawers. One AA cable is always required between a pair of PCIe2 SAS adapters with write cache (pair of #5913 or a pair of #ESA3) unless all six (three pair) of ports are used to attach I/O drawers. If an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/ O drawers, sharing their bandwidth.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. p.This cable is almost identical to the #5916 6m SAS AA cable, except #ECC4 connectors for the SAS adapters are more narrow allowing it to fit onto the newer PCIe3 SAS adapters.

- Attributes provided: high speed connection between two PCIe2 or two PCIe3 SAS adapters with write cache
- Attributes required: available top connectors on pair of PCIe2 or PCIe3 SAS adapters with write cache
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC7) - 3M Optical Cable Pair for PCIe3 Expansion Drawer

The 3.0 meter active optical cable (AOC) pair connects a PCIe3 module in the PCIe Gen3 I/O Expansion Drawer to a PCIe3 Optical Converter Adapter in the system unit. There are two identical cables in the cable pair, each with two CXP connectors. One of the cables attaches to the top CXP port of the PCIe3 module and to the top CXP port of the PCIe3 Optical Converter Adapter. The other cable attaches to the bottom CXP ports. See also other AOC cable length options such as the feature #ECC8 (10 meter).

- Attributes provided: Pair of 3 meter active optical cables
- Attributes required: CXP ports on a PCIe3 Optical Cable Adapter and on a PCIe3 module iin a PCIe Gen3 Expansion Drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECC8) - 10M Optical Cable Pair for PCIe3 Expansion Drawer

The 10.0 meter active optical cable (AOC) pair connects a PCIe3 module in the PCIe Gen3 I/O Expansion Drawer to a PCIe3 Optical Converter Adapter in the system unit. There are two identical cables in the cable pair, each with two CXP connectors. One of the cables attaches to the top CXP port of the PCIe3 module and to the top CXP port of the PCIe3 Optical Converter Adapter. The other cable attaches to the bottom CXP ports. See also other AOC cable length options such as the feature #ECC6 (2 meter). The 10 meter length is suggested for cabling to a different rack.

- Attributes provided: Pair of 10 meter active optical cables
- Attributes required: CXP ports on a PCIe3 Optical Cable Adapter (#EJ07) and on a PCIe3 module such as a #EMXF in a PCIe Gen3 Expansion Drawer (#EMX0)
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECCF) - System Port Converter Cable for UPS

Converter cable allows a serial cable attached to a Uninterruptible Power Supply (UPS) to connect to a USB port on the server's service processor card. Cable's connectors are USB (Male) and 9 PIN D SHELL (Female) and the cable's length is about 1.6m (60 inches). The UPS can provide power status information over the cable to IBM i.

- Attributes provided: Converter Cable
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECCG) - Variable Length, Blue Cat5e Cable

This feature allows manufacturing to select the appropriate length Cat5e cable, Blue during the assembly process.

- Attributes provided: Cat5e Ethernet Cable.
- Attributes required: RJ45 ports/transceivers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply
  Note: Cable is only used for Solution.

(#ECCH) - Variable Length, Green Cat5e Cable

This feature allows manufacturing to select the appropriate length Cat5e cable, Green during the assembly process.

- Attributes provided: Cat5e Ethernet Cable.
- Attributes required: RJ45 ports/transceivers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply
  Note: Cable is only used for Solution.

(#ECCJ) - Variable Length, Yellow Cat5e Cable

This feature allows manufacturing to select the appropriate length Cat5e cable, Yellow during the assembly process.

- Attributes provided: Cat5e Ethernet Cable.
- Attributes required: RJ45 ports/transceivers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply
  Note: Cable is only used for Solution.

(#ECCK) - Variable Length FIBRE SAN CABLE

(No longer available as of February 28, 2019)

This feature allows manufacturing to select the appropriate length Fibre SAN Cable during the assembly process.

- Attributes provided: FIBRE SAN CABLE.
- Attributes required: RJ45 ports/transceivers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply
  Note: Cable is only used for Solution.

(#ECCN) - Variable Length DAC QSFP+ TO QSFP+ CABLE

This feature allows manufacturing to select the appropriate length DAC QSFP+ TO QSFP+ CABLE during the assembly process.

- Attributes provided: DAC QSFP+ TO QSFP+ CABLE.
- Attributes required: RJ45 ports/transceivers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply
  Note: Cable is only used for Solution.

(#ECCS) - 3M Copper CXP Cable Pair for PCIe3 Expansion Drawer

This 3.0 meter cable pair connects a PCIe3 fan-out module in the PCIe Gen3 I/O Expansion Drawer to a PCIe3 Optical Converter Adapter in the system unit. There are two identical copper cables in the cable pair, each with two CXP connectors. One of the cables attaches to the top CXP port of the PCIe3 fan-out module and to the top CXP port of the PCIe3 Optical Converter Adapter. The other cable attaches to the bottom CXP ports.

"Optical" Converter Adapter features were named when only optical cables were announced and copper cables were not planned. The output of the adapter is a CXP interface which can also be used for this copper cable pair.

See also optical AOC cables features for cables which are much thinner and can be longer such as the feature #ECC8 (10 meter) cable, but are more costly.

Limitation: Can not mix copper and optical cables on the same PCIe Gen3 I/O drawer. Both fan-out modules use copper cables or both use optical cables.

- Attributes provided: Pair of 3 meter CXP copper cables
- Attributes required:
  - CXP ports on a PCIe3 Optical Cable Adapter (#EJ05 or #EJ08) and on a PCIe3 module such as a #EMXF or EMXG /ELMF or ELMG in a PCIe Gen3 Expansion Drawer (#EMX0/ ELMX).
  - Firmware level 8.40 or later.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDJ) - 3.0M SAS X12 Cable (Two Adapter to Enclosure)

This 3 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four Mini-SAS HD (High Density) connectors. Two of connectors attach to two SAS adapters such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/ O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability. Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC. Limitation: This cable can not be used the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.

- Attributes provided: connection between two SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDK) - 4.5M SAS X12 Active Optical Cable (Two Adapter to Enclosure)

This 4.5 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four Mini-SAS HD (High Density) connectors. Two of connectors attach to two SAS adapters such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/ O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

Limitation: This cable can not be used with the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.
Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

- Attributes provided: Connection between two SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: Available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDL) - 10M SAS X12 Active Optical Cable (Two Adapter to Enclosure)

This 10 meter SAS cable connects two SAS adapters to a SAS I/O enclosure. This X cable has four Mini-SAS HD (High Density) connectors. Two of connectors attach to two SAS adapters such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/ O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

Limitation: This cable can not be used with the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.
Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

- Attributes provided: Connection between two SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: Available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDT) - 1.5M SAS YO12 Cable (Adapter to Enclosure)

This 1.5 meter SAS cable connects one SAS adapter to a SAS I/O enclosure. This YO cable has three Mini-SAS HD (High Density) connectors. One of connectors attach to a SAS adapter such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability. Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC. Limitation: This cable can not be used the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.

- Attributes provided: connection between a SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDU) - 3.0M SAS YO12 Cable (Adapter to Enclosure)

This 3 meter SAS cable connects one SAS adapter to a SAS I/O enclosure. This YO cable has three Mini-SAS HD (High Density) connectors. One of connectors attach to a SAS adapter such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability. Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapters can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC. Limitation: This cable can not be used the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.

- Attributes provided: connection between a SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDV) - 4.5M SAS YO12 Active Optical Cable (Adapter to Enclosure)

This 4.5 meter SAS cable connects one SAS adapter to a SAS I/O enclosure. This YO cable has three Mini-SAS HD (High Density) connectors. One of connectors attach to a SAS adapter such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

Limitation: This cable can not be used with the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.
Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

- Attributes provided: Connection between a SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: Available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECDW) - 10M SAS YO12 Active Optical Cable (Adapter to Enclosure)

This 10 meter SAS cable connects one SAS adapter to a SAS I/O enclosure. This YO cable has three Mini-SAS HD (High Density) connectors. One of connectors attach to a SAS adapter such as in the PCIe3 SAS Adapter. The other two connectors attach to one SAS I/O Enclosure such as the EXP12SX (#ESLL/#ELLL) or EXP24SX (#ESLS/ #ELLS). This cable is designed for high speed (DHS) to support up to 12Gb throughput if the adapter has that capability.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the I/ O drawer. See SAS cabling documentation for the length of each leg of the cable. The SAS adapters can be in the same or in different PCIe I/O drawers. Or one adapter can be in a supported Power System CEC and the other adapter can be in a PCIe I/O drawer. Or both adapters can be in a supported Power System CEC.

Limitation: This cable can not be used with the EXP24S I/O drawer (#5887 or# EL1S) which uses Mini-SAS connectors which are not HD.
Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

- Attributes provided: Connection between a SAS adapters with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS HD connectors
- Attributes required: Available connectors on SAS controllers and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECE0) - 0.6M SAS AA12 Cable (Adapter to Adapter)

This 0.6 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density) connectors which connect the top connectors of two PCIe3 SAS adapters with write cachce such as #EJ0L or #EJ14. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable is designed for high speed to support up to 12Gb throughput. Note EJ0L/EJ14 support 6Gb. Two AA cable is always required between a pair of PCIe3 SAS adapters with write cache when just one or two I/O drawers are attached. One AA cables is required if three I/O drawers are attached. If four drawers are attached or if an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth. AA cables are not used with SAS adapters with no write cache. Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. The 6Gb version of this cable is feature #5918. #5918 and #ECE0 can be mixed on the same PCIe3 adapter pair.

- Attributes provided: connection between two SAS adapters with Mini-SAS HD connectors
- Attributes required: available connectors on SAS controllers
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECE3) - 3.0M SAS AA12 Cable

This 3.0 meter SAS cable has two Mini-SAS HD (High Density) connectors, and is designed for high speed to support up to 12Gb throughput. This is a straight cable (in contrast with X or YO cables) that has two distinct uses:

- For Elastic Storage Server (ESS) solutions that have a 5147-024 I/O drawer, this cable is used to attach the 5147-024 to its controller.
- For POWER Servers with #5887, #EL1S, #ESLS, #ESLL, #ELLS, or #ELLL I/O drawers driven by paired PCIe controllers with write cache such as #EJ0L or #EJ14, this cable is used to connect the top connectors of the paired controllers. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card.

Note that X or YO cables are always used to attach I/O drawers #5887, #EL1S, #ESLS, #ESLL, #ELLS, or #ELLL to controllers on POWER Servers. Straight cables (such as #ECE3) are not allowed to directly attach to I/O drawers on POWER Servers.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache when just one or two I/O drawers are attached. One AA cable is required if three I/O drawers are attached. If four drawers are attached or if an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth. On POWER Servers, AA cables are not used with SAS adapters with no write cache. Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters. The 6Gb version of this cable is feature #5915. #5915 and #ECE3 can be mixed on the same PCIe3 adapter pair.

- Attributes provided: For ESS solutions, connection between a SAS controller and one 5174-024 I/O drawer. For POWER Systems, connection between two paired SAS controllers with write cache and Mini-SAS HD connectors.
- Attributes required: For ESS solutions, a 5147-024 I/O drawer and appropriate controller. For POWER Systems, available connectors on SAS controllers.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECE4) - 4.5M SAS AA12 Active Optical Cable (Adapter to Adapter)

This 4.5 meter SAS cable connects a pair of SAS adapters to each other. This AA cable has two Mini-SAS HD (High Density) connectors which connect the top connectors of two PCIe3 SAS adapters with write cachce such as #EJ0L or #EJ14. The cable provides a high performance path of all the dual controller communication including mirroring the write cache and status awareness of each card. This cable is designed for high speed to support up to 12Gb throughput. Note EJ0L/EJ14 support 6Gb.

Two AA cables are always required between a pair of PCIe3 SAS adapters with write cache when just one or two I/O drawers are attached. One AA cable is required if three I/O drawers are attached. If four drawers are attached or if an AA cable fails or is disconnected, then the information it was carrying is then sent over the cables attached to the I/O drawers, sharing their bandwidth. AA cables are not used with SAS adapters with no write cache.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the two adapters.
Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

http://www-912.ibm.com/e_dir/eServerPrereq.nsf
- Attributes provided: Connection between two SAS adapters with Mini-SAS HD connectors
- Attributes required: Available connectors on SAS controllers
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECJ5) - 4.3m (14-Ft) PDU to Wall 3PH/24A 200-240V Delta-wired Power Cord

This power cord feature ECJ5 contains an Amphenol type of connector and only supported on PDUs ECJK or ECJL, and ECJP or ECJQ.

ECJ5 has a 4-pin IEC 60309 style plug, 430P9W. It contains three line conductors and a protective earth, but no neutral. ECJ5 is supported in countries that use a delta electrical distribution. ECJ5 is not supported in China, Hong Kong, and other countries that use a wye electrical distribution.

- Attributes provided: Power cord
- Attributes required: PDU features ECJK or ECJL, and ECJP or ECJQ.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECJ7) - 4.3m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power Cord

This power cord feature ECJ7 contains an Amphenol type of connector and only supported on PDUs ECJK or ECJL, and ECJP or ECJQ.

ECJ7 has a 4-pin IEC 60309 style plug, 460P9W. It contains three line conductors and a protective earth, but no neutral. ECJ7 is supported in countries that use a delta electrical distribution. ECJ7 is not supported in China, Hong Kong, and other countries that use a wye electrical distribution.

- Attributes provided: Power cord
- Attributes required: PDU features ECJK or ECJL, and ECJP or ECJQ.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECJJ) - High Function 9xC19 Single-Phase or Three-Phase Wye PDU plus

This is an intelligent, switched 200-240 volt single-phase or 380-415/220-240 volt three-phase wye AC Power Distribution Unit (PDU) plus with nine C19 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the nine C19 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Depending on country wiring standards the PDU is single-phase or three-phase wye. Three-phase wye-wired connectors have 5-pins and use three line conductors, a neutral, and a protective earth. The input is 380-415 volt line-to-line and the output is 220-240 volt line-to-neutral for three-phase wye PDUs.

See three-phase #ECJK/ECJL for countries which do not use wye wiring.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, and #6667.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are generally not easily accessed and therefore IBM does not generally recommend their use.

#ECJG and #ECJJ are identical PDUs. Up to one lower price #ECJG can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #EPTJ PDU.

- Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with an Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Nine C19 PDU plus - switched, power monitoring
- Attributes required: PDU wall line cord and space in 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECJL) - High Function 9xC19 PDU plus 3-Phase Delta

This is an intelligent, switched 200-240 volt 3-phase delta AC Power Distribution Unit (PDU) plus with nine C19 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the nine C19 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Three-phase delta-wired connectors have 4-pins and use three line conductors and a protective earth. The input is 200-240 volt line-to-line and the output is 200-240 volt line-to-line for three-phase delta PDUs.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One wall line cord is also ordered separately and attaches to the Amphenol inlet connector. Supported line cords include features #ECJ5 and #ECJ7.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are generally not easily accessed and therefore IBM does not generally recommend their use.

#ECJK and #ECJL are identical PDUs. Up to one lower price #ECJK can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #EPTL PDU.

Not supported in China, Hong Kong, and other countries that use a wye electrical distribution.

- Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with an Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.
- Attributes provided: Nine C19 PDU plus - switched, power monitoring
- Attributes required: space in rack, 3-phase 208V AC delta electrical service
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECJN) - High Function 12xC13 Single-Phase or Three-Phase Wye PDU plus

This is an intelligent, switched 200-240 volt single-phase or 380-415/220-240 volt three-phase wye AC Power Distribution Unit (PDU) plus with twelve C13 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the twelve C13 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Depending on country wiring standards the PDU is single-phase or three-phase wye. Three-phase wye-wired connectors have 5-pins and use three line conductors, a neutral, and a protective earth. The input is 380-415 volt line-to-line and the output is 220-240 volt line-to- neutral for three-phase wye PDUs.

See three-phase #ECJP/ECJQ for countries which do not use wye wiring.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C14 plug connect to C13 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, and #6667.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

Feature #ECJM and #ECJN are identical PDUs. Up to one lower price #ECJM can be ordered with a new 7014-T42/T00 rack in place of a no- charge #9188 PDU.

For comparison, this is most similar to the earlier generation #EPTN PDU.

- Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with an Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.
- Attributes provided: Twelve C13 PDU plus - switched, power monitoring
- Attributes required: PDU wall line cord and space in 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECJQ) - High Function 12xC13 PDU plus 3-Phase Delta

This is an intelligent, switched 200-240 volt 3-phase delta AC Power Distribution Unit (PDU) plus with twelve C13 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the twelve C13 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Three-phase delta-wired connectors have 4-pins and use three line conductors and a protective earth. The input is 200-240 volt line-to-line and the output is 200-240 volt line-to-line for three-phase delta PDUs.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One wall line cord is also ordered separately and attaches to the Amphenol inlet connector. Supported line cords include features #ECJ5 and #ECJ7.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

#ECJP and #ECJQ are identical PDUs. Up to one lower price #ECJP can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #EPTP PDU.

Not supported in China, Hong Kong, and other countries that use a wye electrical distribution.

- Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with an Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.
- Attributes provided: Twelve C13 PDU plus - switched, power monitoring
- Attributes required: space in rack, 3-phase 208V AC delta electrical service
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECP0) - Cloud Private Solution

This feature indicates that it is a Cloud Private Solution.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES:

(#ECR0) - 2.0 Meter Slim Rack

Provides a 19-inch, 2.0 meter high rack with 42 EIA units of total space for installing rack mounted CECs and/or expansion units. The ECR0 rack does not come equipped with a standard front door, rear door or side covers. The following features are required for every #ECR0 rack:

- 1x #ECRF (high-end appearance front door) or ECRM (Basic Front Door)
- 1x #ECRG (Rear Door)
- 2x ECRJ (Side Covers)

The following optional feature is also offered for the ECR0 rack.

- ECRK - Rack Rear Extension

Up to four vertically mounted Power Distribution Units (PDU) are supported and every vertically mounted PDU requires #ELC0. Each PDU beyond four will consume 1U of rack space.

- Attributes provided:19 inch, 2.0M, 42 EIA Rack
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: One of feature #ECRF, and one of feature #ECRG and two of feature #ECRJ are required per one #ECR0 ordered.

(#ECRF) - Rack Front Door High-End appearance

This feature provides a front door in High-End appearance with an IBM logo for the S42 rack. A front door such as #ECRF is recommended on the S42 rack. A front door is required on ECR0 rack. IBM ships rack with the handle on the right and hinges on the left viewed facing the front of the rack.

The door comes with a lock which is keyed the same as the rear door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: Front Door with lock
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECRG) - Rack Rear Door Black

This feature provides a rear door in flat black color for the S42 rack. Feature number ECRF and ECR0 rack and ECRG are recommended on the S42 rack. A front and rear door is required on the ECR0 rack.

The door is the full width of the rack and the hinges and lockplate can be moved from side to side allowing the door to be opened on the left or on the right. IBM ships rack with the handle on the right and hinges on the left viewed facing the rear of the rack.

The front doors , rear doors and side panels come with a lock which is keyed the same as the front door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: Rear Door with lock
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECRJ) - Rack Side Cover

This feature provides one side panels in black color for the S42 or feature #ECR0 rack. Each side panel can cover either the left or the right side of the rack. These side covers are optional but recommended on S42 rack. 2x ECRJ are required on every ECR0 for optimal airflow through a rack and for physical security.

The front door, rear doors and side panels come with a lock which is keyed the same as the front door or side panels. Uniquely keyed locks can be obtained by the client directly from Southco, the vendor from whom IBM purchased the lock.

- Attributes provided: One side panel for rack.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECRK) - Rack Rear Extension 5-In

- Attributes provided: Rack Rear Extension
- Attributes required: Maximum one per feature #ECR0 rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECRM) - Rack Front Door for Rack (Black/Flat)

- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ECSC) - Custom Service Specify, Shenzhen, China

Having #ECSC on the order, will cause the order to be routed to Shenzhen and the machine to be internally routed to the CSC build area.

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECSF) - Custom Service Specify, Montpellier, France

Having #ECSF on the order, will cause the order to be routed to France and the machine to be internally routed to the CSC build area.

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECSM) - Custom Service Specify, Mexico

Having #ECSM on the order, will cause the order to be routed to Mexico and the machine to be internally routed to the CSC build area.

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECSP) - Custom Service Specify, Poughkeepsie, USA

Having #ECSP on the order, will cause the order to be routed to Poughkeepsie, USA and the machine to be internally routed to the CSC build area.

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#ECSS) - Integrated Solution Packing

(No longer available as of February 28, 2019)

This is a routing indicator for Solution packing.

- Attributes provided: Routing instruction for manufacturing
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ECW0) - Optical Wrap Plug

A wrap plug is a small connector designed to perform a diagnostic test called a loopback test. This wrap plug is inserted into a SR optical port on a PCIe Fibre Channel adapter or a SR or LR optical port on a PCIe Ethernet adapter

This is a multi-mode LC fiber optic wrap plug with an inside/ outside optics diameter of 50/125. Its IBM part number as of early 2016 is 12R9314. An earlier equivalent function IBM part number which is no longer shipped is 11P3847.

It is strongly recommended that Fibre Channel adapters (HBAs) fill any empty adapter ports with a wrap plug. There is no technical issue leaving a port empty. However, filling all ports with a cable to a device/switch or with a wrap plug can speed the booting/IPLing of a partition and can avoid error messages uselessly pointing to a planned empty port.

There is no technical issue leaving an Ethernet port empty. Whether an Ethernet port is empty or contains a wrap plug should not impact boot/IPL time or impact empty-port messages.

- Attributes provided: Wrap plug
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHCE) - IBM Cognos Business Intelligence

(No Longer Available as of December 29, 2017)

Routing indicator for IBM Cognos Business Intelligence on Power Solution.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
    - AIX 6.1 and 7.1 or later supported
    - IBM i - not supported
    - Red Hat Enterprise Linux 6.5, or later
    Refer to Program Product Software Requirements for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EHDS) - InfoSphere Information Server (IIS) / Data Stage

(No Longer Available as of December 29, 2017)

Routing indicator for InfoSphere Information Server (IIS) / Data Stage on Power Solution.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - AIX 6.1 and 7.1 or later supported
    - IBM i - not supported
    - Red Hat Enterprise Linux 6.5, or later
    Refer to Program Product Software Requirements for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EHJD) - PureApp Gen3 Consolidation Feature

PureApp Gen3 Consolidation FC

- Attributes provided: Base Indicator for PureApplication
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EHJL) - P8 S822 Build Ahead / Specify

P8 S822 Build Ahead / Specify

- Attributes provided: Base Indicator for PureApplication
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EHKV) - SAP HANA TRACKING FEATURE

SAP HANA tracking feature that defines manufacturing routing.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- Return parts MES: Does not apply

(#EHKX) - PurePower Base Indicator

(No longer available as of August 7, 2018)

PurePower base Indicator

- Attributes provided: Base Indicator for PurePower
- Attributes required: Cannot be used with EHKZ
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EHR1) - Boot Drive / Load Source in EXP12SX Specify (in #ESLL or #ELLL)

Indicates that boot drive (disks or SSDs) are placed in an EXP12SX SAS Storage Enclosure

- Attributes provided: Boot drive location specify
- Attributes required: Available SAS bay and supported disk/SSD
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHR2) - Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)

Indicates that boot drive or load source (disks or SSDs)are placed in an EXP24SX SAS Storage Enclosure

- Attributes provided: Boot drive / load source location specify
- Attributes required: Available SAS bay and supported disk/SSD
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHS2) - SSD Placement Indicator - #ESLS/#ELLS

This is an IBM internal automatic generated SSD specify indicator for placement and it is not selectable.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHSS) - SPSS Modeler Server Gold

(No Longer Available as of December 29, 2017)

This feature specifies a SPSS on Power Solution. The solution will be integrated at the Customer Solution Center.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX 6.1 and 7.1 or later supported
  - IBM i - not supported
  - Red Hat Enterprise Linux for POWER 6.5, or later
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EJ05) - PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer

PCIe3 x16 adapter provides two CXP ports for the attachment of two active optical CXP cables (AOC) or two CXP copper cables. One adapter supports the attachment of one PCIe3 fan-out module in a PCIe Gen3 I/O Expansion Drawer. CCIN is 2B1C.

Card is a double-wide adapter which plugs into a x16 slot and physically overlaps an adjacent slot. EJ05 is similar to EJ07 and EJ08, but has different packaging and different CCIN.

- Attributes provided: PCIe3 adapter with two CXP ports to attach two active optical cables or two CXP copper cables.
- Attributes required: Two PCIe3 slots of which at least one is a x16 slot in system unit plus a pair of CXP cables (one cable pair feature such as #ECC7 or #ECCS). Copper cables require Firmware 8.40 or later.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ0J) - PCIe3 RAID SAS Adapter Quad-port 6 Gb x8

The PCIe3 RAID SAS Adapter is a high performance SSD/HDD controller using PCIe Gen3 x8 technology. The adapter does not have write cache and thus pairing with another PCIe3 RAID SAS Adapter (#EJ0J or #EJ0M) is optional. Pairing can provide controller redundancy and enhance performance. There are no batteries in the adapter to maintain.dapter to maintain.

The adapter provides four Mini-SAS HD (high density) narrow connectors for the attachment of SAS drives located in the EXP24S, EXP12SX or EXP24SX storage enclosures or #5802/5803/EL36 12X PCIe I/O drawers. X, YO or AT SAS cables with HD narrow connectors are used to attach to these drawers. A max of 4 EXP24S/EXP12SX/EXP24SX can be attached. A maximum of 48 SSD can be attached and a maximum of 96 HDD can be attached per adapter or per adapter pair.

The adapter provides RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. The adapter provides RAID 5 and RAID 6 for all levels of IBM i and also provides RAID 10 for later levels of IBM i. IBM i provides both OS mirroring and data spreading. AIX/Linux/VIOS provide OS mirroring (LVM).

Features #EJ0J and #EJ0M are electronically identical with the same CCIN of 57B4. #EJ0J has a full-high tailstock bracket and air baffle. #EJ0M has a low profile tailstock bracket. #EJ10/#EJ11 are identical with #EJ0J/#EJ0M, but have different feature codes to identify their use as tape/DVD controllers to IBM configurator tools instead of disk/SSD controllers.

Both 5xx and 4k byte sector HDD/SSD are supported for POWER8 servers. 5xx byte sector HDD/SSD are supported for earlier generation servers. 5xx and 4k drives cannot be mixed in the same array..

Limitations:

- HDD/SSD workloads which are performance sensitive to WRITES should use the #EJ14 or #EJ0L controller which provides write cache.
- HDD and SSD cannot be mixed on the same SAS port, but can be mixed on the same adapter.
- #5886 3.5-inch SAS Storage Drawer is not supported.
- 177 GB SSD are not supported.
- Running SAS bays for both a #5887 EXP24S I/O drawer and a 12X-attached #5802/5803 I/O drawer on the same adapter or adapter pair is not supported. Note mixing EXP24S or EXP12SX or EXP24SX is supported.
- If controlling drives in a #5802/5803/EL36 as a single controller, the #EJ0J must be located in that #5802/5803/EL36. If controlling drives in a #5802/5803/EL36 as a pair of controllers, at least one of the SAS adapter pairs must be located in that #5802/5803/EL36.
- Tape/DVD cannot be mixed with disk/SSD on the same adapter.
- Attributes provided: full high PCIe3 four port x8 SAS RAID adapter with no write cache and optional pairing.
- Attributes required: One PCIe slot per adapter and Mini-SAS HD narrow connector SAS cables such as #ECBJ-ECBL, #ECBT-ECBV, #ECCO-ECC4 or 12 Gb cables such as #ECDJ, ECDT or #ECDU.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ0L) - PCIe3 12 GB Cache RAID SAS Adapter Quad-port 6 Gb x8

The PCIe3 12 GB Cache RAID SAS Adapter provides high performance HDD and/or SSD controller function using PCIe Gen3 technology. A pair of adapters are required to provide mirrored write cache data and adapter redundancy. Integrated flash memory provides protection of the write cache without batteries in case of power failure. Effectively up to 12 GB of write cache is provided using compression of 4 GB of physical cache.

The adapter provides four Mini-SAS HD (high density) narrow connectors for the attachment of SAS drives located in the SAS EXP24S or EXP12SX or EXP24SX storage enclosures or #5802/5803/EL36 12X PCIe I/O drawers. X, YO or AT SAS cables with HD narrow connectors are used to attach to these drawers. A max of 4 EXP24S/EXP12SX/EXP24SX can be attached with a maximum of 96 HDD or a maximum of 48 SSD. Two AA SAS cable with HD narrow connectors are attached to the #EJ0L pair to communicate status and cache content information and are required unless three or four ports are being used to attach HDD/SSD.

The #EJ0L provides RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. The adapter provides RAID 5 and RAID 6 for all levels of IBM i and also provides RAID 10 for later levels of IBM i. IBM i provides both OS mirroring and data spreading. AIX/Linux/VIOS provide OS mirroring (LVM). This adapter can also support the Easy Tier function (RAID 52T, 62T or 102T) for AIX and Linux. The adapter's CCIN is 57CE.

Both 5xx and 4k byte sector HDD/SSD are supported for POWER8 servers. 5xx byte sector HDD/SSD are supported for earlier generation servers. 5xx and 4k drives cannot be mixed in the same array.

Limitations:

- HDD and SSD cannot be mixed on the same SAS port, but can be mixed on the same adapter.
- #5886 3.5-inch SAS I/O Drawer is not supported.
- 177 GB SSD are not supported.
- Running SAS bays for both a #5887 EXP24S I/O drawer and a 12X-attached #5802/5803 I/O drawer on the same adapter pair is not supported. Note mixing EXP24S or EXP12SX or EXP24SX is supported.
- If controlling drives in a #5802/5803/EL36 at least one of the #EJ0L pairs must be located in that #5802/5803/EL36.
- Attributes provided: full high PCIe3 four port x8 adapter with up to 12 GB write cache.
- Attributes required: One PCIe slot per adapter and Mini-SAS HD narrow connector SAS cables such as #ECBJ-ECBL, #ECBT-ECBV, #ECCO-ECC4.or 12 Gb cables such as ECDT or #ECDU.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ0M) - PCIe3 LP RAID SAS ADAPTER Quad-Port 6Gb x8

The PCIe3 RAID SAS LP Adapter is a high performance SSD/HDD controller using PCIe Gen3 x8 technology. The adapter does not have write cache and thus pairing with another PCIe3 RAID SAS Adapter (#EJ0M or #EJ0J) is optional. Pairing can provide controller redundancy and enhance performance. There are no batteries in the adapter to maintain.

The adapter provides four Mini-SAS HD (high density) narrow connectors for the attachment of SAS drives located in the EXP24S, EXP12SX, EXP24SX storage enclosure or #5802/EL36 12X PCIe I/O drawers. X, YO or AT SAS cables with HD narrow connectors are used to attach to these drawers. A max of 4 EXP24S/EXP12SX/EXP24SX can be attached. A maximum of 48 SSD can be attached and a maximum of 96 HDD can be attached per adapter or per adapter pair.

The adapter provides RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. The adapter provides RAID 5 and RAID 6 for all levels of IBM i and also provides RAID 10 for later levels of IBM i. IBM i provides both OS mirroring and data spreading. AIX/Linux/VIOS provide OS mirroring (LVM).

Features #EJ0J and #EJ0M are electronically identical with the same CCIN of 57B4. #EJ0J has a full-high tailstock bracket and air baffle. #EJ0M has a low profile tailstock bracket. #EJ10 / #EJ11 are identical with #EJ0J / #EJ0M respectively, but have different feature codes to identify their use to IBM configurator tools as tape/DVD controllers instead of disk/SSD controllers.

Both 5xx and 4k byte sector HDD/SSD are supported for POWER8 servers. 5xx byte sector HDD/SSD are supported for earlier generation servers. 5xx and 4k drives cannot be mixed in the same array.

Limitations:

- HDD/SSD workloads which are performance sensitive to WRITES should use the #EJ14 or #EJ0L controller which provide write cache.
- HDD and SSD cannot be mixed on the same SAS port, but can be mixed on the same adapter.
- #5886 3.5-inch SAS Storage Drawer is not supported.
- 177 GB SSD are not supported.
- Running SAS bays for both a EXP24S storage drawer and a 12X-attached #5802/5803 I/O drawer on the same adapter or adapter pair is not supported. Note mixing EXP24S or EXP12SX or EXP24SX is supported.
- A single #EJ0M cannot control drives in a #5802/5803/EL36 because the adapter must be located in that #5802/5803/ EL36 in a full high slot. However, if controlling drives in a #5802/5803/EL36 as a pair of controllers, one #EJ0J can be located in that #5802/5803/EL36 and one #EJ0M can be in the system's low profile slot.
- Tape/DVD cannot be mixed with disk/SSD on the same adapter.
- Attributes provided: low profile PCIe3 four port x8 SAS RAID adapter with no write cache and optional pairing Attributes required: One low profile PCIe slot per adapter and Mini-SAS HD narrow connector SAS cables such as #ECBJ-ECBL, #ECBT-ECBV, #ECCO-ECC4 or 12 Gb cables such as #ECDJ, ECDT or #ECDU.

- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EJ0T) - Storage Backplane 12 SFF-3 Bays/DVD Bay

(No longer available as of December 31, 2020)

Storage backplane with integrated SAS controller for SAS bays and DVD in the system unit. SAS bays are 2.5-inch or Small Form Factor (SFF) and used drives mounted on a carrier/tray specific to the system unit (SFF-3).

The high performance SAS controller provides RAID-0, RAID-5, RAID-6 and RAID-10 support for either HDD or SSD. JBOD support for HDD is also supported. Controller has no write cache.

For split backplane capability add #EJ0V feature. For write cache performance use #EJ0U Backplane instead of this backplane.

Both 5xx and 4k byte sector HDD/SSD are supported. 5xx and 4k drives cannot be mixed in the same array.

- Attributes provided: Storage backplane with one integrated SAS adapter with no cache running 12 SFF-3 SAS bays in the system unit and one DVD bay in the system unit
- Attributes required: Server without #EJ0U backplane
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EJ0U) Storage Backplane 8 SFF-3 Bays/1.8-inch SSD Attach/DVD Bay/Dual IO A with Write Cache

(No longer available as of December 31, 2020)

Storage backplane with dual integrated SAS controllers with effectively up to 7.2 GB write cache. High performance controllers run SFF-3 SAS bays, 1.8-inch SSD cage bays, and DVD bay in the system unit. Dual controllers (also called dual I/O adapters or paired controllers) and their write cache are placed in integrated slots and do not use PCIe slots. However cache power protection hardware covers one PCIe x8 slot. Write cache augments controller's high performance for workloads with writes, especially for HDD. 1.8 GB physical write cache is leveraged with compression to provide up to 7.2 GB cache capacity. The write cache contents are protected against power loss with flash memory and super capacitors removing the need for battery maintenance.

The high performance SAS controllers provide RAID-0, RAID-5, RAID-6 and RAID-10 support. Patented Active/Active configurations with at least two arrays is supported.

Easy Tier function is supported so the dual controllers can automatically move hot data to attached SSD and cold data to attached HDD for AIX/Linux/VIOS environments.

Small Form Factor (SFF) or 2.5-inch drives are mounted on a carrier/tray specific to the system unit (SFF-3). The backplane has eight SFF-3 bays. This backplane also provides two SAS ports on the rear of the system unit support the attachment of one EXP24S I/O drawer in mode1 holding HDD or SSD. Two SAS YO cables ordered separately with mini-SAS HD narrow connectors are used for the optional EXP24S attachment.

The #EJTL SSD cage is a required co-requisite feature.

Note this backplane doesn't support split backplane. For split backplane use #EJ0T + #EJ0V backplane features.

Both 5xx and 4k byte sector HDD/SSD are supported. 5xx and 4k drives cannot be mixed in the same array.

Limitation: this backplane option reduces the number of available x8 PCIe slots in the system unit by one.

- Attributes provided: Storage backplane with a pair of integrated SAS adapters with write cache running four things: a) a set of 8 SFF-3 SAS bays in the system unit: b) one DVD bay in the system unit; c) an optional 1.8-inch SSD cage in the system unit; d) two SAS ports on the rear of the system unit

- Attributes required: Server without #EJ0T backplane
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No
  Note: Easy Tier capability requires the following:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, or later
  - VIOS 2.2.3.3 or later

(#EJ0V) - Split #EJ0T to 6+6 SFF-3 Bays: Add 2nd SAS Controller

(No longer available as of December 31, 2020)

This feature modifies the base Storage backplane cabling and adds a second, high performance SAS controller. The existing 12 SFF-3 SAS bays are cabled to be split into two sets of six bays, each with one SAS controller. Both SAS controllers are located integrated slots and do not use a PCIe slot.

The high performance SAS controllers each provides RAID-0, RAID-5, RAID-6 and RAID-10 support. JBOD support for HDD is also supported. There is no write cache on either controller.

Both 5xx and 4k byte sector HDD/SSD are supported. 5xx and 4k drives cannot be mixed in the same array.

- Attributes provided: A second integrated SAS adapter with no cache and internal cables to provide two sets of six SFF-3 bays in the system unit
- Attributes required: #EJ0T backplane feature
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EJ10) - PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8

The PCIe3 SAS Adapter is a high performance SAS tape controller using PCIe Gen3 x8 technology. The adapter supports external SAS tape drives such as the LTO-5, LTO-6, LTO-7, and LTO-8 found in the IBM 7226-1U3 Multimedia drawers, or tape units such as the TS2250, TS2260, TS2270, and TS2280 single External Tape Drive, TS2900, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD RAM drive features available on the IBM 7226-1U3 Storage Enclosure. The adapter provides four Mini-SAS HD (high density) connectors to which AE1 SAS cables such as #ECBY and/or YE1 SAS Cables such as #ECBZ with HD narrow connectors can be attached. A max of 4 tape drives per adapter can be attached using four AE1 cables. A max of 8 tape drives can be attached using four YE1 cables.

#EJ10 (full high) and #EJ11 (low profile) are electronically the same adapter with the same 57B4 CCIN, but differ in that their tailstocks fit different size PCIe slots.

#EJ0J and #EJ10 are the same adapter with the same 57B4 CCIN, but have different feature code numbers to indicate different usage to IBM configurator tools. #EJ10 runs SAS LTO-5 or later drives and DVD. Support of both tape/DVD and HDD/SSD on the same adapter is not supported.
Note: The original #EJ0X adapter does not support DVD but also has the same CCIN.
Note: Adapter uses a Mini-SAS HD narrow connector and AE1 #ECBZ or YE1 #ECBY SAS cable.

Limitation: LTO-4 or earlier drives are not supported.

- Attributes provided: full high PCIe3 four port x8 SAS adapter
- Attributes required: One PCIe slot per adapter
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ11) - PCIe3 LP SAS Tape/DVD Adapter Quad-port 6Gb x8

The PCIe3 Low Profile SAS Adapter is a high performance SAS tape controller using PCIe Gen3 x8 technology. The adapter supports external SAS tape drives such as the LTO-5, LTO-6, LTO-7, and LTO-8 found in the IBM 7226-1U3 Multimedia drawers, or tape units such as the TS2250, TS2260, TS2270, and TS2280 single External Tape Drive, TS2900, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD RAM drive features available on the IBM 7226-1U3 Storage Enclosure. The adapter provides four Mini-SAS HD (high density) connectors to which AE1 SAS cables such as #ECBY and/or YE1 SAS Cables such as #ECBZ with HD narrow connectors can be attached. A max of 4 tape drives per adapter can be attached using four AE1 cables. A max of 8 tape drives can be attached using four YE1 cables.

#EJ10 (full high) and #EJ11 (low profile) are electronically the same adapter with the same 57B4 CCIN, but differ in that their tailstocks fit different size PCIe slots.

#EJ0M and #EJ11 are the same adapter with the same 57B4 CCIN, but have different feature code numbers to indicate different usage to IBM configurator tools. #EJ11 runs SAS LTO-5 or later tape drives and DVD. Support of both tape/DVD and HDD/SSD on the same adapter is not supported.
Note: Adapter uses a Mini-SAS HD narrow connector and AE1 #ECBZ or YE1 #ECBY SAS cable.

Limitation: LTO-4 or earlier drives are not supported.

- Attributes provided: low profile PCIe3 four port x8 SAS adapter
- Attributes required: One low profile PCIe slot per adapter
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EJ13) - PCIe3 LP FPGA Accelerator Adapter

(No longer available as of April 24, 2020)

This PCIe Gen3 FPGA (Field Programmable Gate Array) adapter acts as a co-processor for the POWER8 processor chip handling specialized, repetitive function extremely efficiently. The adapter is preloaded with a GZIP application and is intended to run as a gzip accelerator. The GZIP application maximum bandwidth is a PCIe Gen2 interface bandwidth.

#EJ12 and #EJ13 are electronically identical with the same CCIN of 59AB. #EJ12 has full high tail stock and #EJ13 has a low profile tail stock.

- Attributes required: PCIe Gen3 x16 slot - low profile
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
    - AIX - supported
    - IBM i - not supported
    - Red Hat Enterprise Linux 7.1, Little Endian, for Power, or later
    - Red Hat Enterprise Linux 7.1, Big Endian, for Power, or later

  Note: VIOS not supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: One per processor feature

(#EJ14) - PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8

The PCIe3 12 GB Cache RAID PLUS SAS Adapter provides high performance HDD and/or SSD controller function using PCIe Gen3 technology. A pair of #EJ14 adapters are required to provide mirrored write cache data and adapter redundancy. Integrated flash memory provides protection of the write cache without batteries in case of power failure. Effectively up to 12 GB of write cache is provided using compression of 4 GB of physical cache.

The #EJ14 provides four Mini-SAS HD (high density) narrow connectors for the attachment of SAS drives located in the SAS EXP24S, EXP12SX, or EXP24SX storage enclosures X, YO or AT SAS cables with HD narrow connectors are used to attach to these drawers. A max of 4 EXP24S can be attached with a maximum of 96 HDD or a maximum of 72 SSD per pair of #EJ14. If more than 48 SSD are attached, no HDD can be attached. A mix of EXP24S, EXP12SX or EXP24SX is supported on the same adapter pair.

Two AA SAS cable with HD narrow connectors are attached to the #E14L pair to communicate status and cache content information and are required unless three or four ports are being used to attach HDD/SSD.

Feature #EJ14 provides RAID 0, RAID 5, RAID 6, and RAID 10, RAID 5T2, RAID 6T2, and RAID 10T2 for AIX and Linux and VIOS. Two tier arrays (5T2, 6T2 and 10T2) combine both HDD and SSD into a single array with Easy Tier functionality. AIX/Linux/VIOScan also provide OS mirroring (LVM).

On systems that support IBM i, the adapter provides RAID 5 and RAID 6 for IBM i. RAID 10 is supported by IBM i 7.2. IBM i provides both OS mirroring and data spreading.

This adapter is very similar to the #EJ0L SAS adapter, but #EJ14 uses a second CPU chip in the card to provide more IOPS capacity and can attach more SSD. The #EJ14 adapter's CCIN is 57B1.

Both 5xx and 4k byte sector HDD/SSD are supported. 5xx and 4k drives cannot be mixed in the same array.

Limitations:

- Not supported on POWER7/POWER7+ servers.
- HDD and SSD cannot be mixed on the same SAS port, but can be mixed on the same adapter
- Attributes provided: full high PCIe3 four port x8 adapter with up to 12 GB write cache.
- Attributes required: One PCIe slot per adapter and Mini-SAS HD narrow connector SAS cables such as #ECBJ-ECBL, #ECBT-ECBV, #ECCO-ECC4 or 12 Gb cables such as ECDT or #ECDU.

- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - AIX version 7.2 with the 7200-00 Technology Level and Service Pack 2
    - AIX version 7.1 with the 7100-04 Technology Level and Service Pack 2
    - AIX version 7.1 with the 7100-03 Technology Level and Service Pack 7 (planned availability September 8, 2016)
    - AIX version 6.1 with the 6100-09 Technology Level and Service Pack 7
    - IBM i supported only with VIOS
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Linux Enterprise Server 11, Service Pack 4, or later
    - SUSE Linux Enterprise Server 12, Service Pack 1, or later
    - Ubuntu 16.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.4.20 or later

(#EJ18) - PCIe3 LP CAPI FlashSystem Accelerator Adapter

(No longer available as of April 24, 2020)

PCIe adapter with accelerator FPGA for low latency connection using CAPI (Coherent Accelerator Processor Interface). The adapter has two 8Gb optical SR fiber connections for attachment to FlashSystem Drawer.

Adapter must be placed in a x16 slot in the system unit which is CAPI enabled. The server must have CAPI enablement feature.

Features #EJ17 and #EJ18 are electronically identical, but have different tailstock brackets. #EJ17 is full high and #EJ18 is low profile.

Limitation: Concurrent add, remove or replacement of this adapter is not supported.

- Attributes provided: CAPI enabled FPGA
- Attributes required: One x16 CAPI enabled PCIe3 Slot
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- Limitation: Concurrent add, remove or replacement of this adapter is not supported.
- OS level required:
    - AIX 7.2 or later supported
    - IBM i - not supported
    - Linux - not supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ1N) - PCIe1 LP SAS Tape/DVD Dual-port 3Gb x8 Adapter

(No longer available as of December 31, 2020)

This is a PCIe Gen1 short x8 form factor adapter. It supports the attachment of SAS tape and DVD using a pair of mini SAS 4x connectors. The PCIe1 can be used for external tape drives which are not supported on the newer and faster 4-port 6Gb PCIe3 adapter (see feature code #EJ10/EJ11/EL60). The adapter supports external SAS tape drives such as the DAT72, DAT160, LTO-4, LTO-5, LTO-6, and LTO-7 found in the IBM multimedia drawers such as the 7226-1U3 or 7214-1U2 or tape units such as the TS2240, TS2340, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD-ROM/RAM drives.

SAS adapter-to-enclosure (AE) 3Gb cables with mini-SAS connectors are used to attach these drives. See feature codes #3684 (3 meter) and #3685 (6 meter). The same AE cables can often alternatively be ordered under the tape enclosure or multimedia drawer.

Feature EJ1N and EJ1P are electrically and functionally identical with the same CCIN of 57B3. EJ1N has a low profile tailstock bracket and EJ1P has a full-high tailstock bracket. Feature EJ1N/EJ1P is the same adapter as #5278/5901 but designates to IBM configurator tools that the usage will be tape/DVD and will not be used for disk.

- Attributes provided: Two mini SAS 4x connectors
- Attributes required: One PCIe slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
    - IBM i supported only with VIOS
    - AIX Version 6.1, or later
    - AIX Version 7.1, or later
    - AIX Version 7.2, or later
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 6.5, or later
    - Red Hat Enterprise Linux 7, or later
    - Red Hat Enterprise Linux 7.1, little endian, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - SUSE Linux Enterprise Server 12, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ1P) - PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter

(No longer available as of December 31, 2020)

This is a PCIe Gen1 short x8 form factor adapter. It supports the attachment of SAS tape and DVD using a pair of mini SAS 4x connectors. The PCIe1 can be used for external tape drives which are not supported on the newer and faster 4-port 6Gb PCIe3 adapter (see feature code #EJ10/EJ11/EL60). The adapter supports external SAS tape drives such as the DAT72, DAT160, LTO-4, LTO-5, LTO-6, and LTO-7 found in the IBM multimedia drawers such as the 7226-1U3 or 7214-1U2 or tape units such as the TS2240, TS2340, TS3100, TS3200, and TS3310. Other removable media devices supported include IBM SAS/SATA DVD-ROM/RAM drives.

SAS adapter-to-enclosure (AE) 3Gb cables with mini-SAS connectors are used to attach these drives. See feature codes #3684 (3 meter) and #3685 (6 meter). The same AE cables can often alternatively be ordered under the tape enclosure or multimedia drawer.

Feature EJ1P and EJ1N are electrically and functionally identical with the same CCIN of 57B3. EJ1P has a full-high tailstock bracket and EJ1N has a low profile tailstock bracket. Feature EJ1P/EJ1N is the same adapter as #5901/5278 but designates to IBM configurator tools that the usage will be tape/DVD and will not be used for disk.

- Attributes provided: Two mini SAS 4x connectors
- Attributes required: One PCIe slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - IBM i supported only with VIOS
    - AIX Version 6.1, or later
    - AIX Version 7.1, or later
    - AIX Version 7.2, or later
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 6.5, or later
    - Red Hat Enterprise Linux 7, or later
    - Red Hat Enterprise Linux 7.1, little endian, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - SUSE Linux Enterprise Server 12, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ28) - PCIe Crypto Coprocessor Gen3 BSC 4765-001

(No Longer Available as of January 20, 2017)

Secure-key adapter provides both cryptographic coprocessor and cryptographic accelerator functions in a single PCIe card. The adapter is well suited to applications requiring high-speed, security- sensitive, RSA acceleration, cryptographic operations for data encryption and digital signing, secure management, and use of cryptographic keys, or custom cryptographic applications. It provides secure storage of cryptographic keys in a tamper-resistant hardware security module designed to meet FIPS 140-2 level 4 security requirements. The adapter is a PCIe 4x full height - short card.

#EJ27, #EJ28 and #EJ29 are all feature codes representing the same physical card with the same CCIN of 4765, but different feature codes are used to indicate if a blind swap cassette is used and its type. #EJ27 indicates no blind swap cassette. #EJ28 indicates a Gen 3 blind swap cassette. #EJ29 indicates a Gen 4 blind swap cassette. 2

#EJ27, EJ28 and EJ29 are identical to #4807, #4808 and #4809 adapters which were manufactured after 2012, but different from #4807, #4808 and #4809 adapters manufactured prior to 2012.

Other IBM PCIe Cryptographic Coprocessor adapter highlights

- Integrated Dual processors that operate in parallel for higher reliability
- Supports IBM Common Cryptographic Architecture or PKCS#11 standand
- Ability to configure adapter as coprocessor or accelerator
- Support for smart card applications using Europay, MasterCard and Visa
- Cryptographic key generation and random number generation
- PIN processing - generation, verification, translation
- Encrypt/Dectrypt using AES and DES keys

Please refer to the following URL for the latest firmware and software updates.

http://www-03.ibm.com/security/cryptocards/

- Attributes provided: Cryptographic Coprocessor and Accelerator Functions
- Attributes required: One full-high PCIe slot using a gen3 blind swap cassette such as found in an EM0X Gen3 I/O drawer or #5802/5803/5873/5877 12X-attached I/O drawer
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
    - AIX 6.1 and 7.1 or later supported
    - IBM i - not supported
    - Linux - not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ33) - PCIe3 Crypto Coprocessor BSC-Gen3 4767

(No longer available as of December 31, 2020)

Secure-key adapter provides both cryptographic coprocessor and cryptographic accelerator functions in a single PCIe card. The adapter is well suited to applications requiring high-speed, security- sensitive, RSA acceleration, cryptographic operations for data encryption and digital signing, secure management, and use of cryptographic keys, or custom cryptographic applications. It provides secure storage of cryptographic keys in a tamper-resistant hardware security module designed to meet FIPS 140-2 level 4 security requirements. The adapter is a PCIe Gen 3 x4 full height - short card. The adapter runs in dedicated mode only (no PowerVM virtualization).

#EJ32 and #EJ33 are both feature codes representing the same physical card with the same CCIN of 4767. Different feature codes are used to indicate if a blind swap cassette is used and its type. #EJ32 indicates no blind swap cassette. #EJ33 indicates a Gen 3 blind swap cassette.

IBM PCIe Cryptographic Coprocessor adapter highlights

- Integrated Dual processors that operate in parallel for higher reliability, often 2x performance improvement over prior generation crypto cards
- Uses newer level Power Processor (PPC) processor than previous generation cards
- Supports IBM Common Cryptographic Architecture (CCA 5.3) and PKCS#11 standand
- Ability to configure adapter as coprocessor or accelerator
- Support for smart card applications using Europay, MasterCard and Visa
- Cryptographic key generation and random number generation
- PIN processing - generation, verification, translation
- Encrypt/Dectrypt using AES and DES keys

Please refer to the following URL for the latest firmware and software updates http://www-03.ibm.com/security/cryptocards/

- Attributes provided: Cryptographic Coprocessor and Accelerator Functions
- Attributes required: One full-high PCIe Gen3 slot which uses a blind swap cassette
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
    - AIX Version 7.2 with the 7200-01 Technology Level or later
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 3 and APAR IV88680 or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 8 and APAR IV88679 or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 8 or later (planned availability 1/27/2017)
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 3 or later (planned availability 1/27/2017)
    - IBM i not supported
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Ubuntu 16.04.01, or later
    Linux software support can be downloaded from the following location:

    http://www-03.ibm.com/security/cryptocards/pciecc2/or dersoftware.shtml
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJPJ) - Specify mode-2 (1)5901/5278 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that one EXP24 SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 2 (two groups of 12 drive bays) with only one group of 12 drive bays enabled by connecting to one PCIe 3G SAS controller (5901/5278) using one appropriate YO cable. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped."

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 2 with 12 drive bays enabled
- Attributes required: One YO cable (#3691/#EL1Z 1.5M, #3692/#EL20 3M, #3693/#EL1W 6M, #3694/#EL1U 15M) and one (5901/5278) dedicated to the single #5887 or #EL1S

- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJPK) - Specify mode-2 (2)5901/5278 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that one EXP24 SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 2 (two groups of 12 drive bays) with only one group of 12 drive bays enabled by connecting to two PCIe 3G SAS controllers (5901/5278) using one appropriate X cable. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 2 with 12 drive bays enabled
- Attributes required: One dual X cable (#3661/#EL22 1 1.5M, #3662/#EL23 3M, #3663/#EL21 15M) and two (5901/5278) dedicated to the single #5887 or #EL1S
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJPL) - Specify mode-4 (1)5901/5278 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 4 (four groups of 6 drive bays) with only one group of 6 drive bays enabled by connecting to one PCIe 3G SAS controller (5901/5278) using one appropriate X cable connecting to only one adapter port. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 4 with 6 drive bays enabled
- Attributes required: One dual X cable #3661/#EL22 1 1.5M, #3662/#EL23 3M, #3663/#EL21 15M) and one (5901/5278) dedicated to the single #5887 or #EL1S
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJPM) - Specify mode-4 (2)5901/5278 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 4 (four groups of 6 drive bays) with two groups of 6 drive bays enabled by connecting to two PCIe 3G SAS controllers (5901/5278) using one appropriate X cable connecting to only one adapter port on each controller. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 4 with 12 drive bays enabled
- Attributes required: One dual X cable (#3661/#EL22 1 1.5M, #3662/#EL23 3M, #3663/#EL21 15M) and two (5901/5278) dedicated to the single #5887 or #EL1S

- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJPN) - Specify mode-4 (3)5901/5278 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 4 (four groups of 6 drive bays) with three groups of 6 drive bays enabled by connecting to three PCIe 3G SAS controllers (5901/5278) using two appropriate X cables connecting to only one adapter port on each controller. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 4 with 18 drive bays enabled
- Attributes required: Two dual X cables (#3661/#EL22 1 1.5M, #3662/#EL23 3M, #3663/#EL21 15M) and three (5901/5278) dedicated to the single #5887 or #EL1S
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJPR) - Specify mode-2 (2)5903/5805 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 2 (two groups of 12 drive bays) with only one group of 12 drive bays enabled by connecting to one pair of PCIe 3G SAS RAID controllers (5903/5805) using one appropriate X cable. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 2 with 12 drive bays enabled.
- Attributes required: One dual X cable #3661/#EL22 1 1.5M, #3662/#EL23 3M, #3663/#EL21 15M) and two (5903/5805) dedicated to the single #5887 or #EL1S
- Minimum required: 0
- Maximum allowed: 14 (Initial order maximum: 14)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJPT) - Specify mode-2 (2)5913 for EXP24 #5887 or #EL1S

(No longer available as of December 31, 2020)

Feature indicates that EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S) will be configured to Mode 2 (two groups of 12 drive bays) with only one group of 12 drive bays enabled by connecting to one pair of PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb controllers (5913) using one appropriate 6G X cable. IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Designated #5887 or #EL1S configuration in Mode 2 with 12 drive bays enabled.
- Attributes required: One 6G dual X cable (#3454/#EL1Z 3M, #3455/#EL20 6M, #3456/#EL1Y 10M) and one pair 5913 dedicated to the single #5887 or #EL1S.
- Minimum required: 0
- Maximum allowed: 14 (Initial order maximum: 14)
- OS level required:
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJR1) - Specify Mode-1 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 1 and be using one PCIe3 RAID SAS adapter (#EJ0J/EJ0M/EL3B) and one 6G YO SAS Cable.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, one PCIe3 RAID SAS adapter, one SAS YO cable
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR2) - Specify Mode-1 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 1 and be using two (one pair) PCIe3 RAID SAS adapters (#EJ0J/EJ0M/EL3B) and two 6G YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 RAID SAS adapters, two SAS YO cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR3) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two (one pair) RAID PCIe3 SAS adapters (#EJ0J/EJ0M/EL3B) and two 6G X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 RAID SAS adapters, two SAS X cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux 6 or later supported
  - SUSE Linux Enterprise Server 11 or later supported
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR4) - Specify Mode-2 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using four (two pair) PCIe3 RAID SAS adapters (#EJ0J/EJ0M/EL3B) and two 6G X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, four PCIe3 RAID SAS adapters, two SAS X cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR5) - Specify Mode-4 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 4 and be using four (unpaired) PCIe3 RAID SAS adapters (#EJ0J/EJ0M/EL3B) and two 6G X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, four PCIe3 RAID SAS adapters, two SAS X cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR6) Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using one PCIe3 RAID SAS adapter (#EJ0J/EJ0M/EL3B) and two 6G YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawe, one PCIe3 RAID SAS adapter,two SAS YO cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJR7) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two (nonpaired) PCIe3 RAID SAS adapters (#EJ0J/EJ0M/EL3B) and two 6G YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 RAID SAS adapters, two SAS YO cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRA) Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (1) YO for EXP24S (#5887/EI1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using one PCIe3 RAID SAS adapter (#EJ0J/EJ0M/EL3B) and one 6G YO SAS Cables. This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJR7.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, one PCIe3 RAID SAS Adapter, one 6G YO SAS cable
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRB) Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (1) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two PCIe3 RAID SAS adapters (#EJ0J/EJ0M/EL3B) and one 6G X SAS Cable.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJR4.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 RAID SAS Adapters, one 6G X SAS cable
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRC) - Specify Mode-4 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 4 and be using one PCIe3 RAID SAS adapter (#EJ0J/EJ0M/EL3B) and one 6G X SAS Cables. One leg of the X cable is left unattached at the adapter end.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJR5, #EJRD or #EJRE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, one PCIe3 RAID SAS Adapter, one 6G X SAS cable
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRD) - Specify Mode-4 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 4 and be using two (nonpaired) PCIe RAID SAS adapters (#EJ0J/EJ0M/EL3B) and one 6G X SAS Cables.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJR5 or #EJRE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 RAID SAS Adapters, one 6G X SAS cable
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRE) - Specify Mode-4 & (3)EJ0J/EJ0M/EL3B for EXP24S (#5888/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 4 and be using three (nonpaired) PCIe3 RAID SAS adapter (#EJ0J/EJ0M/EL3B) and two 6G X SAS Cables. One leg of one X cable is left unattached at the adapter end.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJR5.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, three PCIe3 RAID SAS Adapters, two 6G X SAS cables
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRF) - Specify Mode-1 & (2)EJ14 for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 1 and be using two PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8 (#EJ14) and two 6G YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer in mode1, two PCIe3 #EJ14, two SAS YO cables
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: Refer to feature EJ14
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRG) Specify Mode-2 & (2)EJ14 & (2) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8 (#EJ14) and two 6G X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer in mode 2, two PCIe3 #EJ14, two SAS X cables
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required: Refer to #EJ14
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRH) Specify Mode-2 & (2)EJ14 & (1) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8 (#EJ14) and one 6G X SAS Cable.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer in mode2, two PCIe3 #EJ14, one SAS X cable
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: Refer to #EJ14
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRJ) - Specify Mode-2 & (4)EJ14 for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using four PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8 (#EJ14) and two 6G X SAS Cable.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer in mode2, four PCIe3 #EJ14, two SAS X cables
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: Refer to #EJ14
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRL) - Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter

Feature EJRL must be added for every instance of a non-paired SAS RAID adapter #EJ14. It identifies a specific high availability configuration supported by AIX or Linux which has one #EJ14 on one system and the paired #EJ14 located on a second system. IBM i does not support paired adapter on different servers.

SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized as its pair. This specify indicates the pairing will not be on just one server.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: Only one #EJ14 on a server and its pair on a different server.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: Refer to #EJ14
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRP) - Specify Mode-1 & (2)EJ0L for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 1 and be using two PCIe3 12GB Cache RAID SAS adapters (#EJ0L) and two 6G YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 12GB Cache SAS RAID adapters, two SAS YO cables
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRR) - Specify mode-2 & (4) EJ0L for EXP24S #5887/EL1S

(No longer available as of December 31, 2020)

Specify feature EJRR (Specify mode-2 & (4)EJ0L for EXP24S #5887 or #EL1S) directs manufacturing to configure SFF drawer to mode 2 (two sets of 12 SFF bays) and four PCIe2 12GB Cache RAID SAS Adapter Quad-port 6Gb. Select #EJ0L and two appropriate length HD narrow X cable (#ECBJ -#ECBM). Include two AA cables (#ECCO - #ECC4) between each pair of SAS adapters (total of 4 AA cables). Note: IBM does not provide changes to the mode setting after #5887 or #EL1S is shipped.

- Attributes provided: Configure #5887/EL1S in Mode 2
- Attributes required: Two dual X cables, four AA cables and one port on each of four #EJ0Ls dedicated to the single #5887/EL1S.
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EJRS) Specify Mode-2 & (2)EJ0L & (2) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two PCIe3 12GB RAID SAS adapters (#EJ0L) and two 6G X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 12GB Cache SAS RAID adapters, two SAS X cables
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRT) Specify Mode-2 & (2)EJ0L & (1) X for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two 12GB Cache RAID SAS adapters (#EJ0L) and one 6G X SAS Cable.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe3 12GB Cache SAS RAID adapters, one SAS X cable
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRU) - Non-paired Indicator EJ0L PCIe SAS RAID Adapter

Feature EJRU must be added for every instance of a non-paired SAS RAID adapter #EJ0L. It identifies a specific high availability configuration supported by AIX or Linux which has one #EJ0L on one system and the paired #EJ0L located on a second system. IBM i does not support paired adapter on different servers.

- Attributes provided: SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.
- Attributes required: Every #EJ0L requires a 6Gb/s SAS RAID adapter (#EJ0L) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJS1) - Non-paired Indicator ESA3 PCIe SAS RAID Adapter

Feature EJS1 must be added for every instance of a non-paired SAS RAID adapter #ESA3. It identifies a specific high availability configuration supported by AIX or Linux which has one #ESA3 on one system and the paired #ESA3 located on a second system. IBM i does not support paired adapter on different servers.

SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.

Every #EJS1 requires a 6Gb/s SAS RAID adapter (#ESA3) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.

Limitation

- Cannot be used with #5913
- Cannot be used with #5924
- Attributes provided: SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.
- Attributes required: Every #ESA3 requires a 6Gb/s SAS RAID adapter CR (#ESA3) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJS2) - Specify Mode-2 & (2)ESA3 for EXP24S (#5887/#EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using two (one pair) of PCIe2 1.8GB RAID SAS adapter (#ESA3) and one X SAS Cable.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24S. If additional adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJS4.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe2 1.8GB Cache RAID SAS Adapters, one X SAS cable
- Minimum required: 0
- Maximum allowed: 14 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJS3) - Specify Mode-1 & (2)ESA3 for EXP24S (#5887/#EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 1 and be using two (one pair) of PCIe2 1.8GB RAID SAS adapter (#ESA3) and two YO SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, two PCIe2 1.8GB Cache RAID SAS Adapters, two SAS YO cables
- Minimum required: 0
- Maximum allowed: 14 (Initial order maximum: 0)
- OS level required: Refer to #ESA3
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJS4) - Specify Mode-2 & (4)ESA3 for EXP24S (#5887/#EL1S)

(No longer available as of December 31, 2020)

This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24S SFF Gen2-bay Drawer (#5887/#EL1S) should be configured in Mode 2 and be using four (two pairs) of PCIe2 1.8GB RAID SAS adapters (#ESA3) and two X SAS Cables.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: EXP24S Drawer, four PCIe2 1.8GB Cache SAS RAID Adapters, two SAS X cables
- Minimum required: 0
- Maximum allowed: 14 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJT4) - Front Bezel for 12-Bay BackPlane

(No longer available as of December 31, 2020)

Front bezel with IBM logo plus adjustable depth rails for 2U rack mounted system. Bezel fits #EJ0T Storage Backplane and its 12 SAS bays. Rails adjust from approximately 24 to 31 inches in depth.

- Attributes provided: Bezel
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJT5) - Front Bezel for 8-Bay BackPlane

(No longer available as of December 31, 2020)

Front bezel with IBM logo plus adjustable depth rails for 2U rack mounted system. Bezel fits #EJ0U Storage Backplane and its 8 SAS bays and optional SSD cage. Rails adjust from approximately 24 to 31 inches in depth.

- Attributes provided: Bezel
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJT6) - Front OEM Bezel for 12-Bay BackPlane

Front bezel with no IBM logo plus adjustable depth rails for 2U rack mounted system. Bezel fits #EJ0T Storage Backplane and its 12 SAS bays. Rails adjust from approximately 24 to 31 inches in depth.

- Attributes provided: Bezel
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJT7) - Front OEM Bezel for 8-Bay BackPlane

Front bezel with no IBM logo plus adjustable depth rails for 2U rack mounted system. Bezel fits #EJ0U Storage Backplane and its 8 SAS bays and optional SSD cage. Rails adjust from approximately 24 to 31 inches in depth.

- Attributes provided: Bezel
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJTL) - Six-bay 1.8-inch SSD Cage

(No longer available as of December 31, 2020)

Provides a cage or enclosure for six 1.8-inch SAS SSD. The cage is located on the front of the server and supports SSD concurrent maintenance assuming the drives have been protected by mirroring or RAID-5, etc. SSD are controlled by the dual IOA controllers included in the EJ0U storage backplane.

- Attributes provided:
  2U Cage assembly for six 1.8" SSD Drives

- Attributes required: Dual IOA backplane
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV0) - Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 1 (one group of 12 drive bays). It will be connected to the two SAS ports on the rear of the system unit run by the integrated SAS controllers of the high performance/function storage backplane.

Two YO12 cables connect the SAS Storage Enclosure to the systems SAS ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, Integrated SAS controllers and SAS cables as indicated in description
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV1) - Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 1 (one group of 12 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

One YO12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV2) - Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 1 (one group of 12 drive bays). It will be connected to two (one pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV3) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two (one pair) #EJ0J/#EL59/ #EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV4) - Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to four (two pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV5) - Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 4 (four groups of 3 drive bays). It will be connected to four (unpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV6) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJV7) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two (nonpaired) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBT, #ECBU, #ECBV or#ECBW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVA) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

One YO12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBT, #ECBU, #ECBV or#ECBW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV7.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVB) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two (one pair) #EJ0J/#EL59/ #EJ0M/#EL36 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV4.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVC) - Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 4 (four groups of 3 drive bays). It will be connected to one #EJ0J/#EL59/ #EJ0M/#EL36 PCIe3 RAID SAS adapter.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL. One leg of the X12 cable is left unattached at the adapter end.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV5, #EJVD or #EJVE. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP12SX Drawer (#ESLL/ELLL) should be configured in Mode 4 and be using one PCIe3 RAID SAS adapter (#EJ0J/EL59/EJ0M/EL3B) and one X12 SAS Cables. One leg of the X cable is left unattached at the adapter end. This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP12SX. If adapters/ cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV5, #EJVD or #EJVE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVD) - Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 4 (four groups of 3 drive bays). It will be connected to Two (nonpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV5 or #EJVE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVE) - Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 4 (four groups of 3 drive bays). It will be connected to Three (nonpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL. One leg of one of the two X12 cables is left unattached at the adapter end.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJV5.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVF) - Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 1 (one group of 12 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVG) - Specify Mode-2 & (2)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL

(No Longer Available as of January 24, 2017)

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVH) - Specify Mode-2 & (2)EJ14 & (1)X12 for EXP12SX #ESLL/ELLL

(No Longer Available as of January 24, 2017)

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJVG.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVJ) - Specify Mode-2 & (4)EJ14 & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to four #EJ14 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVP) - Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 1 (one group of 12 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVR) - Specify Mode-2 & (4)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to four #EJ0L PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVS) - Specify Mode-2 & (2)EJ0L & (2)X12 for EXP12SX #ESLL/ELLL

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVT) - Specify Mode-2 & (2)EJ0L& (1)X12 for EXP12SX #ESLL/ELLL

(No Longer Available as of January 24, 2017)

Feature indicates that EXP12SX SAS Storage Enclosure (#ESLL or #ELLL) will be configured by IBM Manufacturing in Mode 2 (two groups of 6 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJVG.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW0) - Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP24SX #ESLS/ELS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to the two SAS ports on the rear of the system unit run by the integrated SAS controllers of the high performance/function storage backplane.

Two YO12 cables connect the SAS Storage Enclosure to the systems SAS ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, Integrated SAS controllers and SAS cables as indicated in description
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW1) - Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

One YO12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW2) - Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to two (one pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
    - IBM i supported only with VIOS
    - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW3) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two (one pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
    - IBM i supported only with VIOS
    - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW4) - Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to four (two pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
    - IBM i supported only with VIOS
    - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW5) - Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 4 (four groups of 6 drive bays). It will be connected to four (unpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW6) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW7) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two (nonpaired) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBT, #ECBU, #ECBV or#ECBW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWA) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to one #EJ0J/#EL59/#EJ0M/ #EL36 PCIe3 RAID SAS adapter.

One YO12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBT, #ECBU, #ECBV or#ECBW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW7.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWB) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two (one pair) #EJ0J/ #EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a "partioal" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW4.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWC) - Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 4 (four groups of 6 drive bays). It will be connected to one #EJ0J/#EL59/ #EJ0M/#EL36 PCIe3 RAID SAS adapter.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL. One leg of the X12 cable is left unattached at the adapter end.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW5, #EJWD or #EJWE. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing that in this configuration one EXP24SX Drawer (#ESLS/ELLS) should be configured in Mode 4 and be using one PCIe3 RAID SAS adapter (#EJ0J/EL59/EJ0M/ EL3B) and one X12 SAS Cables. One leg of the X cable is left unattached at the adapter end. This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the EXP24SX. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW5, #EJWD or #EJWE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWD) - Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 4 (four groups of 6 drive bays). It will be connected to Two (nonpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW5 or #EJWE.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWE) - Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 4 (four groups of 6 drive bays). It will be connected to Three (nonpaired) #EJ0J/#EL59/#EJ0M/#EL36 PCIe3 RAID SAS adapters.

Two X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL. One leg of one of the two X12 cables is left unattached at the adapter end.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJW5.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWF) - Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWG) - Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWH) - Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two #EJ14 PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJWG.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWJ) - Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to four #EJ14 PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWP) - Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

Two YO12 cables connect the SAS Storage Enclsoure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWR) - Specify Mode-2 & (4)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to four #EJ0L PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWS) - Specify Mode-2 & (2)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

Two X12 cables connect the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure. A different specify feature code is used to indicate a "partial" configuration with a subset of adapters and cables is used.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWT) - Specify Mode-2 & (2)EJ0L& (1)X12 for EXP24SX #ESLS/ELLS

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 2 (two groups of 12 drive bays). It will be connected to two #EJ0L PCIe3 RAID SAS adapters.

One X12 cable connects the SAS Storage Enclosure to the SAS adapter ports. Use the cable length appropriate to the configuration and select from features such as #ECBJ, #ECBK or#ECBL.

One specify feature should be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJWG.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required:
  - IBM i supported only with VIOS
  - Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK51) - Full Width Keyboard -- USB, US English, #103P

(No Longer Available as of October 31, 2017)

This feature provides a USB attached US English #103P business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK52) - Full Width Keyboard -- USB, French, #189

(No Longer Available as of October 31, 2017)

This feature provides a USB attached French #189 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK53) - Full Width Keyboard -- USB, Italian, #142

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Italian #142 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK54) - Full Width Keyboard -- USB, German/Austrian, #129

(No Longer Available as of October 31, 2017)

This feature provides a USB attached German/Austrian #129 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK55) - Full Width Keyboard -- USB, UK English, #166P

(No Longer Available as of October 31, 2017)

This feature provides a USB attached UK English #166 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK56) - Full Width Keyboard -- USB, Spanish, #172

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Spanish #172 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK57) - Full Width Keyboard -- USB, Japanese, #194

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Japanese #194P business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK58) - Full Width Keyboard -- USB, Brazilian Portuguese, #275

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Brazilian Portuguese #275 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK59) - Full Width Keyboard -- USB, Hungarian, #208

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Hungarian #208 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK60) - Full Width Keyboard -- USB, Korean, #413

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Korean #413 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK61) - Full Width Keyboard -- USB, Chinese, #467

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Chinese #467 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK62) - Full Width Keyboard -- USB, French Canadian, #445

(No Longer Available as of October 31, 2017)

This feature provides a USB attached French Canadian #445 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK64) - Full Width Keyboard -- USB, Belgian/UK, #120

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Belgian/UK #120 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK65) - Full Width Keyboard -- USB, Swedish/Finnish, #153

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Swedish/Finnish #153 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK66) - Full Width Keyboard -- USB, Danish, #159

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Danish #159 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK67) - Full Width Keyboard -- USB, Bulgarian, #442

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Bulgarian #442 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK68) - Full Width Keyboard -- USB, Swiss/French/German, #150

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Swiss, French/German #150 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK69) - Full Width Keyboard -- USB, Norwegian,#155

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Norwegian #155 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK70) - Full Width Keyboard -- USB, Dutch, #143

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Dutch #143 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK71) - Full Width Keyboard -- USB, Portuguese, #163

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Portuguese #163 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK72) - Full Width Keyboard -- USB, Greek, #319

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Greek #319 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK73) - Full Width Keyboard -- USB, Hebrew, #212

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Hebrew #212 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK74) - Full Width Keyboard -- USB, Polish, #214

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Polish #214 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK75) - Full Width Keyboard -- USB, Slovakian, #245

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Slovakian #245 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK76) - Full Width Keyboard -- USB, Czech, #243

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Czech #243 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK77) - Full Width Keyboard -- USB, Turkish, #179

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Turkish #179 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK78) - Full Width Keyboard -- USB, LA Spanish, #171

(No Longer Available as of October 31, 2017)

This feature provides a USB attached LA Spanish #171 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK79) - Full Width Keyboard -- USB, Arabic, #253

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Arabic #253 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK80) - Full Width Keyboard -- USB, Thai, #191

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Thai #191 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK81) - Full Width Keyboard -- USB, Russian, #443

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Russian #443 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK82) - Full Width Keyboard -- USB, Slovenian, #234

(No Longer Available as of October 31, 2017)

This feature provides a USB attached Slovenian #234 business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EK83) - Full Width Keyboard -- USB, US English Euro, #103P

(No Longer Available as of October 31, 2017)

This feature provides a USB attached US English EURO #103P business black quiet touch keyboard.

- Attributes provided: Keyboard
- Attributes required: USB Port
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELC0) - PDU Access Cord 0.38m

This 0.38 meter (14 inch) cord is used with a vertically mounted PDU (Power Distribution Unit) such as a #7188 or #7109 when the PDU is located in a 7953-94Y or #ER05 Slim Rack. One end of this power cord connects to the PDU. The other end of this cord connects to the power cord running to the wall outlet or electrical power source.

One PDU Access Cord is required per vertically mounted PDU. Without a PDU Access Cord, inserting and removing the wall outlet power cord into the PDU can be very difficult in the narrow side pockets of the Slim Rack. A PDU Access Cord is not required for PDUs in wider racks such as the 7014-T42 or #0553.

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ELC5) - Power Cable - Drawer to IBM PDU (250V/10A)

This feature permits manufacturing to select the optimum PDU power jumper cord length (2.8M or 4.3M) for rack integration. This feature is mandatory for servers that use power supplies with C14 inlets that are going to be factory integrated with IBM racks (such as with 7014-T00 or T42 racks) that contains C19 PDU types.

Feature is not valid on initial order with non-factory integrated feature 4650. Power jumper cord has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C20 on the other end (for IBM PDU C19 receptacle). MES orders of FC #ELC5 will ship 4.3m length. If MES customers want 2.8m length should order #6665.

- Attributes provided: Power jumper cord (2.8m or 4.3m)
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELPM) - Trial PowerVM Live Partition Mobility for POWER8 and below

Clients on PowerVM Standard edition

This feature will enable a customer to evaluate Live Partition Mobility at no-charge for 60 days, or use it to migrate workloads to a new server. At the conclusion of the trial period clients have the option to place an upgrade order for permanent PowerVM Enterprise Edition to maintain continuity.

At the end of the trial period (60 days), the client's system will automatically return to PowerVM Standard Edition. Live Partition Mobility, available only with PowerVM Enterprise Edition, allows for the movement of a running partition from one Power System server to another with no application downtime, resulting in better system utilization, improved application availability, and energy savings. With Live Partition Mobility, planned application downtime due to regular server maintenance can be a thing of the past.

- Attributes provided: A 60-day trial version of PowerVM Enterprise Edition.
- Attributes required: PowerVM Standard Edition and FW 7.3.0, or later.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM83) - 16GB CDIMM, 1600MHZ, 4GBIT DDR3 DRAM, Short

(No longer available as of December 13, 2019)

Provides 16GB of system memory.

- Attributes provided: 16GB of system memory.
- Attributes required: The 8284 model 22A minimum memory is 32GB. Memory must be installed in pairs.
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: All memory features must be ordered in pairs. (Quantity of two.)

(#EM84) - 32 GB DDR3 Memory

(No longer available as of January 17, 2020)

32GB DIMM, 1600MHZ, 4GBIT DDR3 DRAM

- Attributes provided:
  32GB of system memory.

- Attributes required:
  Memory must be installed in pairs.

- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: All memory features must be ordered in pairs. (Quantity of two.)

(#EM85) - 64 GB DDR3 Memory

(No longer available as of January 17, 2020)

64GB DIMM, 1600MHZ, 4GBIT DDR3 DRAM

- Attributes provided:
  64GB of system memory.

- Attributes required:
  Memory must be installed in pairs.

- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: All memory features must be ordered in pairs. (Quantity of two.)

(#EM8P) - 16 GB DDR4 Memory

(No Longer Available as of November 8, 2016)

16 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- firmware 860 or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860 or later
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM8Q) - 32 GB DDR4 Memory

(No Longer Available as of November 8, 2016)

32 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- firmware 860 or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860 or later
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM8R) - 64 GB DDR4 Memory

(No Longer Available as of November 8, 2016)

64 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- firmware 860 or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860 or later
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM96) - 16 GB DDR4 Memory

(No longer available as of November 26, 2019)

This feature provides 16 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- Firmware 860, or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860, or later
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1, or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11, or later supported via VIOS
    - IBM i 7.2 TR3, or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM97) - 32 GB DDR4 Memory

This feature provides 32 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- Firmware 860, or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860, or later
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1, or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11, or later supported via VIOS
    - IBM i 7.2 TR3, or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Yes

(#EM98) - 64 GB DDR4 Memory

This feature provides 64 GB DIMM, 1600MHZ, 4GBIT DDR4 DRAM

Limitations:

- DDR4 memory can not be mixed on the same server with DDR3 memory.
- Memory plugged in pairs (two identical feature codes). See server definition for any single CDIMM configuration exceptions for very entry 1-socket servers.
- Firmware 860, or later
- Attributes provided: One CDIMM
- Attributes required: One CDIMM slot and firmware 860 or later
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1, or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11, or later supported via VIOS
    - IBM i 7.2 TR3, or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMX0) - PCIe Gen3 I/O Expansion Drawer

This 19-inch, 4U (4 EIA) enclosure provides PCIe Gen3 slots outside of the system unit. It has two module bays. One 6-Slot Fanout Module (#EMXF or EMXG) placed in each module bay. Two 6-slot modules provide a total of 12 PCIe Gen3 slots. Each fanout module is connected to a PCIe3 Optical Cable Adapter located in the system unit over an active optical cable (AOC) pair.

The PCIe Gen3 I/O Expansion Drawer has two redundant, hotplug power supplies. Each power supply has its own separately ordered power cord. The two power cords plug into a Power supply conduit which connects to the power supply. The single-phase AC power supply is rated at 1030 Watt and can use 100-120V or 200-240V. If using 100- 120V, then the maximum is 950 Watt. It's recommended the power supply connect to a PDU in the rack. Power Systems PDUs are designed for 200-240V electrical source.

The drawer has fixed rails which can accommodate racks with depths from 27.5 inches to 30.5 inches.

Limitations:

- #EMX0 has a cable management bracket located at the rear of the drawer which swings up to provide service access to the PCIe adapters. 2U (2 EIA) of space is required to swing up the bracket. Thus the drawer can not be placed in the very top 2U of a rack.
- There is a power cord access consideration with vertically mounted PDUs on the right hand side of the rack when viewed from the rear of the rack. The #EMX0 cable management bracket makes accessing some of the PDU outlets located at the same rack height as the #EMX0 drawer more challenging. Using a horizontally mounted PDU or locating the PDU or #EMX0 at a different vertical location is recommended.
- Attributes provided: 19-inch 4U (4 EIA) PCIe Gen3 I/O Expansion Drawer
- Attributes required: One or two PCIe Optical Cable Adapters (#EJ07/#EJ05/#EJ08), one or two PCIe3 fanout modules (#EMXF), one or two CXP cable pairs (such as #ECC6 or #ECC8 or #ECCS), one power supply conduit (such as #EMXA).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - IBM i 7.1 TR10 or later, IBM i 7.2 TR2, or later
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, for Power, big endian, or later
  - Red Hat Enterprise Linux 7.1, for Power, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 14.04.3, or later
  - Ubuntu 16.04, or later
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMXA) - AC Power Supply Conduit for PCIe3 Expansion Drawer

Provides two 320-C14 inlet electrical connections for two separately ordered AC power cords with C13 connector plugs. Conduit provides electrical power connection between two power supplies located in the front of a PCIe Gen3 I/O Expansion Drawer (#EMX0) and two power cords which connect on the rear of the PCIe Gen3 I/O Expansion Drawer.

- Attributes provided: Two AC Power Supply connections
- Attributes required: PCIe Gen3 I/O Expansion Drawer and two AC power cords
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMXB) - DC Power Supply Conduit for PCIe3 Expansion Drawer

(No longer available as of October 19, 2018)

Provides two DC inlet electrical connections for two separately ordered DC power cords. Conduit provides electrical power connection between two power supplies located in the front of a PCIe Gen3 I/O Expansion Drawer (#EMX0) and two power cords which connect on the rear of the PCIe Gen3 I/O Expansion Drawer.

- Attributes provided: Two DC power supply connections
- Attributes required: PCIe Gen3 I/O Expansion Drawer and two DC power cords
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMXF) - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer

(No Longer Available as of December 29, 2017)

PCIe3 fanout module for PCIe Gen3 I/O Expansion Drawer. Provides six PCIe Gen3 full high, full length slots (two x16 and four x8). The PCIe slots are hot plug.

The module has two CXP ports which are connected two CXP ports on a PCIe Optical Cable Adapter #EJ05 or #EJ07 or #EJ08 depending on the server selected. A pair of active optical CXP cables (AOC) or a pair of CXP copper cables are used for this connection. The top CXP port of the fanout module is cabled to the top CXP port of the PCIe3 Optical Cable Adapter. The bottom CXP port of the fanout module is cabled to the bottom CXP port of the same PCIe3 Optical Cable Adapter.

- Attributes provided: PCIe3 6-slot fanout module for PCIe Gen3 I/O Expansion Drawer
- Attributes required: Available bay in PCIe Gen3 I/O Expansion Drawer. Firmware 8.40 or later for copper CXP cables.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - AIX - supported
  - Linux -supported
  - Refer to the Software requirements for the OS levels
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
,
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMXG) - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer

(No longer available as of December 31, 2020)

PCIe3 fanout module for PCIe Gen3 I/O Expansion Drawer. Provides six PCIe Gen3 full high, full length slots (two x16 and four x8). The PCIe slots are hot plug. With firmware 8.4 or later, the fanout module supports concurrent maintenance, though obviously while off-line all its PCIe slots are also off-line. Blind swap cassettes (BSC) are used for the PCIe slots. The BSC are interchangeable with the #5802/5877/5803/5873 12X PCIe I/O Drawer BSC.

The module has two CXP ports which are connected two CXP ports on a PCIe Optical Cable Adapter #EJ05 or #EJ07 or #EJ08 depending on the server selected. A pair of active optical CXP cables (AOC) or a pair of CXP copper cables are used for this connection. The top CXP port of the fanout module is cabled to the top CXP port of the PCIe3 Optical Cable Adapter. The bottom CXP port of the fanout module is cabled to the bottom CXP port of the same PCIe3 Optical Cable Adapter.

EMXG is a follow-on to the original EMXF fanout module. EMXG and EMXF are functionally identical but EMXG implements a small physical change to enable a larger set of potential PCIe adapters to be housed. EMXG and EMXF can be intermixed in the same drawer. There is no difference in firmware or software prerequisites for the EMXF and EMXG. EMXG and for EMXF use the same BSC.

- Attributes provided: PCIe3 6-slot fanout module for PCIe Gen3 I/O Expansion Drawer
- Attributes required: Available bay in PCIe Gen3 I/O Expansion Drawer. Firmware 8.40 or later for copper CXP cables.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Linux -supported
  - AIX - supported
  - IBM i 7.1 TR11, or later supported via VIOS
  - IBM i 7.2 TR3, or later supported via VIOS
  - IBM i 7.3, or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EN01) - 1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper

1m (3.3-ft) copper active twinax Ethernet cable which supports Ethernet data transfer rates up to 10 Gb/s. The cable has a copper twinax transceiver on each end which is placed in an SFP+ port of an adapter and/or a switch. This cabling option can be a cost effective alternative to optical cable for short reach link high-speed connection.

- Attributes provided: 10Gb/s copper active twinax Ethernet cable
- Attributes required: One available SFP+ 10Gb/s Ethernet Port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EN02) - 3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper

3m (9.8-ft) copper active twinax Ethernet cable which supports Ethernet data transfer rates up to 10 Gb/s. The cable has a copper twinax transceiver on each end which is placed in an SFP+ port of an adapter and/or a switch. This cabling option can be a cost effective alternative to optical cable for short reach link high-speed connection.

- Attributes provided: 10Gb/s copper active twinax Ethernet cable
- Attributes required: One available SFP+ 10Gb/s Ethernet Port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EN03) - 5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper

5m (16.4-ft) copper active twinax Ethernet cable which supports Ethernet data transfer rates up to 10 Gb/s. The cable has a copper twinax transceiver on each end which is placed in an SFP+ port of an adapter and/or a switch. This cabling option can be a cost effective alternative to optical cable for short reach link high-speed connection.

- Attributes provided: 10Gb/s copper active twinax Ethernet cable
- Attributes required: One available SFP+ 10Gb/s Ethernet Port
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EN0A) - PCIe3 16Gb 2-port Fibre Channel Adapter

PCIe Gen3 16 Gigabit dual-port Fibre Channel (FC) Adapter is a high-performance 8x short form adapter based on the Emulex LPe16002B PCIe Host Bus Adapter (HBA). The adapter provides two ports of 16 Gb Fibre Channel capability using SR optics. Each port can provide up to 16 Gb Fibre Channel functions simultaneously. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The ports are SFP+ and include an optical SR transceiver. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 4, 8 and 16 Gbps and will automatically negotiate to the highest speed possible. LEDs on each port provide information on the status and link speed of the port.

The adapter connects to a Fibre Channel switch at 4Gb, 8Gb or 16Gb. It can directly attach to a device without a switch at 16Gb. Attachment without a switch is not supported at 4Gb or 8Gb.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Feature #EN0A and #EN0B are electronically identical. They differ physically only that EN0A has a tail stock for full high PCIe slots and #EN0B has a tail stock for low profile PCIe slots. CCIN is 577F for both features.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM4 - multimode 50/125 micron fibre, 4700 MHz*km bandwidth
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

The maximum cable lengths at the three different link speeds are:

```
Cable | 4 Gbps | 8 Gbps | 16 Gbps
--------------------------------
OM4   | 400m   | 190m   | 125m
OM3   | 380m   | 150m   | 100m
OM2   | 150m   | 50m    | 35m
OM1   | 70m    | 21m    | 15m
```

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: Two 16Gb FC ports (with LC connectors)
- Attributes required: Available PCIe Gen2 slot in supported server
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Supports PowerKVM and VIOS. Refer to Software Requirements for specific code levels supported.

(#EN0B) - PCIe3 LP 16Gb 2-port Fibre Channel Adapter

PCIe Gen3 16 Gigabit dual-port Fibre Channel (FC) Adapter is a high-performance 8x short form adapter based on the Emulex LPe16002B PCIe Host Bus Adapter (HBA). The adapter provides two ports of 16 Gb Fibre Channel capability using SR optics. Each port can provide up to 16 Gb Fibre Channel functions simultaneously. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The ports are SFP+ and include an optical SR transceiver. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 4, 8 and 16 Gbps and will automatically negotiate to the highest speed possible. LEDs on each port provide information on the status and link speed of the port.

The adapter connects to a Fibre Channel switch at 4Gb, 8Gb or 16Gb. It can directly attach to a device without a switch at 16Gb under AIX or VIOS or Linux. Attachment without a switch is not supported at 4Gb or 8Gb.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Feature #EN0A and #EN0B are electronically identical. They differ physically only that EN0A has a tail stock for full high PCIe slots and #EN0B has a tail stock for low profile PCIe slots. CCIN is 577F for both features.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM4 - multimode 50/125 micron fibre, 4700 MHz*km bandwidth
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

The maximum cable lengths at the three different link speeds are:

```
Cable | 4 Gbps | 8 Gbps | 16 Gbps
------------------------------------
OM4   | 400m   | 190m   | 125m
OM3   | 380m   | 150m   | 100m
OM2   | 150m   | 50m    | 35m
OM1   | 70m    | 21m    | 15m
```

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: Two 16Gb FC ports (with LC connectors)
- Attributes required: Available PCIe Gen2 slot in supported server
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EN0F) - PCIe2 LP 8Gb 2-Port Fibre Channel Adapter

(No longer available as of May 12, 2020)

This feature ships a two-port, 8 Gb PCIe Gen2 Fibre Channel Adapter based on the QLogic QLE2562 Host Bus Adapter (HBA). Each port provides single initiator capability over a fibre link. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiates to the highest speed possible. LEDs on each port provide information on the status and link speed of the port. The adapter connects to a Fibre Channel switch or can directly attach to a Fibre Channel port on a supported storage unit. N_Port ID Virtualization (NPIV) capability is supported through VIOS. Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables. The following table shows the supported distances for the three different cable types at the three different link speeds.

```
Cable | 2.125 Gbps | 4.25 Gbps | 8.5 Gbps |
------|------------|-----------|----------|
OM3   |.5m - 500m  |.5m - 380m |.5m - 150m|
OM2   |.5m - 300m  |.5m - 150m |.5m - 50m |
OM1   |.5m - 150m  |.5m - 70m  |.5m - 21m |
```

#EN0F and #EN0F are electronically identical with the same CCIN of 578D. #EN0F has a low profile tailstock bracket. #EN0G has a full high tailstock bracket.

See also feature #5273 or #5735 for a 2-port 8Gb Fibre Channel adapter based on an Emulex adapter.

See also optional wrap plug feature #ECW0 which is a) required to run some diagnostic procedures and b) in some cases may speed system boot when placed in empty ports.

See also optional wrap plug feature #ECW0 which is: a) Required to run some diagnostic procedures and b) In some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.

- Attributes provided: Dual port Fibre Channel adapter
- Attributes required: Low Profile PCIe slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later
  - SUSE Linux Enterprise Server 12, Service Pack 1, or later
  - Ubuntu 16.04, or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2
  - AIX version 7.1 with the 7100-03 Technology Level and Service Pack 7 (planned availability September 8, 2016)
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7
  - IBM i supported only with VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.4.2 or later

(#EN0G) - PCIe2 8Gb 2-Port Fibre Channel Adapter

(No longer available as of May 12, 2020)

This feature ships a two-port, 8 Gb PCIe Gen2 Fibre Channel Adapter based on the QLogic QLE2562 Host Bus Adapter (HBA). Each port provides single initiator capability over a fibre link. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiates to the highest speed possible. LEDs on each port provide information on the status and link speed of the port. The adapter connects to a Fibre Channel switch or can directly attach to a Fibre Channel port on a supported storage unit. N_Port ID Virtualization (NPIV) capability is supported through VIOS. Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables. The following table shows the supported distances for the three different cable types at the three different link speeds.

```
Cable | 2.125 Gbps | 4.25 Gbps | 8.5 Gbps |
------|------------|-----------|----------|
OM3   |.5m - 500m  |.5m - 380m |.5m - 150m|
OM2   |.5m - 300m  |.5m - 150m |.5m - 50m |
OM1   |.5m - 150m  |.5m - 70m  |.5m - 21m |
```

#EN0F and #EN0F are electronically identical with the same CCIN of 578D. #EN0F has a low profile tailstock bracket. #EN0G has a full high tailstock bracket.

See also feature #5273 or #5735 for a 2-port 8Gb Fibre Channel adapter based on an Emulex adapter.

See also optional wrap plug feature #ECW0 which is a) required to run some diagnostic procedures and b) in some cases may speed system boot when placed in empty ports.

See also optional wrap plug feature #ECW0 which is: a) Required to run some diagnostic procedures and b) In some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.

- Attributes provided: Dual port Fibre Channel adapter
- Attributes required: Full High PCIe slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later
  - SUSE Linux Enterprise Server 12, Service Pack 1, or later
  - Ubuntu 16.04, or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2
  - AIX version 7.1 with the 7100-03 Technology Level and Service Pack 7 (planned availability September 8, 2016)
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7
  - IBM i supported only with VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.4.2 or later

(#EN0H) - PCIe3 4-port (10Gb FCoE & 1GbE) SR&RJ45

(No longer available as of December 31, 2020)

This PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb SR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA functionality. The 1Gb ports have Ethernet capability. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

NPIV capability is provided through VIOS

SR-IOV capability for the NIC function is supported on specific servers with the appropriate firmware and OS level for any of the four ports.

The 10Gb ports are SFP+ and include an optical SR transceiver. The ports have LC Duplex type connectors and utilize shortwave laser optics and MMF-850nm fiber cabling. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3 or OM4, up to 300 meter fiber cable lengths are supported. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0H and #EN0J adapters are electronically identical. They are physically identical except #EN0H has a tail stock for full high PCIe slots and #EN0J has a tail stock for low profile slots. The CCIN is 2B93 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Supports PowerKVM and VIOS. Refer to Software Requirements for specific code levels supported.

(#EN0J) - PCIe3 LP 4-port (10Gb FCoE & 1GbE) SR&RJ45

(No longer available as of December 31, 2020)

This PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb SR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA functionality. The 1Gb ports have Ethernet capability. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

NPIV capability is provided through VIOS

The 10Gb ports are SFP+ and include an optical SR transceiver. The ports have LC Duplex type connectors and utilize shortwave laser optics and MMF-850nm fiber cabling. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3 or OM4, up to 300 meter fiber cable lengths are supported. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0H and #EN0J adapters are electronically identical. They are physically identical except #EN0H has a tail stock for full high PCIe slots and #EN0J has a tail stock for low profile slots. The CCIN is 2B93 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EN0K) - PCIe3 4-port (10Gb FCoE & 1GbE) SFP+Copper&RJ45

(No longer available as of December 31, 2020)

This PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb ports for active copper twinax cables and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA (both NIC and FCoE) functionality. The 1Gb ports have Ethernet capability. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

NPIV capability is provided through VIOS

SR-IOV capability for the NIC function is supported on specific servers with the appropriate firmware and OS level for any of the four ports.

The 10Gb ports are SFP+ and do not include a transceiver. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. A transceiver is included with these cables. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBase-T. Active cables differ from passive cables. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0K and #EN0L adapters are electronically identical. They are physically identical except #EN0K has a tail stock for full high PCIe slots and #EN0L has a tail stock for low profile slots. The CCIN is 2CC1 for both features.

#EN0K/EN0L are very similar to the #EN0H/#EN0J adapters except the #EN0H/ EN0K use SR optical cabling and has a different CCIN.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux supported
    - SUSE Linux Enterprise Server supported
    - AIX 6.1 and 7.1 or later supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EN0L) - PCIe3 LP 4-port(10Gb FCoE & 1GbE) SFP+Copper&RJ45

(No longer available as of December 31, 2020)

This low profile PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb ports for active copper twinax cables and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA (both NIC and FCoE) functionality. The 1Gb ports have Ethernet capability. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

NPIV capability is provided through VIOS.

SR-IOV capability for the NIC function is supported on specific servers with the appropriate firmware and OS level for any of the four ports.

The 10Gb ports are SFP+ and do not include a transceiver. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. A transceiver is included with these cables. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBase-T. Active cables differ from passive cables. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0K and #EN0L adapters are electronically identical. They are physically identical except #EN0K has a tail stock for full high PCIe slots and #EN0L has a tail stock for low profile slots. The CCIN is 2CC1 for both features.

#EN0K/EN0L are very similar to the #EN0H/#EN0J adapters except the #EN0H/EN0K use SR optical cabling and has a different CCIN.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking

- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - Red Hat Enterprise Linux 8 for Power, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#EN0M) - PCIe3 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter

(No Longer Available as of April 23, 2017)

This PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb LR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA functionality. The 1Gb ports have Ethernet capability. NPIV capability is provided through VIOS. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

SR-IOV capacity for the NIC function is supported on specific servers with the appropriate firmware and OS level for any of the four ports.

The 10Gb ports are SFP+ and include an optical LR transceiver. The ports have LC Duplex type connectors and utilize longtwave laser optics and 1310nm fiber cabling. With 9 micron OS1, up to 10 kilometer length fiber cables are supported. Priority Flow Control (PFC) and Fibre Channel over Ethernet (FCoE) are only supported for distances of 300 meters or less. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0M and #EN0N adapters are electronically identical. They are physically identical except #EN0M has a tail stock for full high PCIe slots and #EN0N has a tail stock for low profile slots. The CCIN is 2CC0 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - full high
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EN0N) - PCIe3 LP 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter

(No Longer Available as of April 23, 2017)

This PCIe Gen3 Converged Network Adapter (CNA) supports both Ethernet NIC (Network Interface Card) and Fibre Channel over Ethernet (FCoE). The adapter provides two 10 Gb LR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter. The 10Gb ports have CNA functionality. The 1Gb ports have Ethernet capability. NPIV capability is provided through VIOS. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8 servers have enabled PCIe Gen3.

Limitation: Fibre Channel over Ethernet (FCoE) function is not supported in POWER9 servers.

The 10Gb ports are SFP+ and include an optical LR transceiver. The ports have LC Duplex type connectors and utilize longtwave laser optics and 1310nm fiber cabling. With 9 micron OS1, up to 10 kilometer length fiber cables are supported. Priority Flow Control (PFC) and Fibre Channel over Ethernet (FCoE) are only supported for distances of 300 meters or less. Note that an FCoE switch is required for any FCoE traffic.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0M and #EN0N adapters are electronically identical. They are physically identical except #EN0M has a tail stock for full high PCIe slots and #EN0N has a tail stock for low profile slots. The CCIN is 2CC0 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.3ab (1 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - low profile
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 6.5 for POWER, or later
  - Red Hat Enterprise Linux 7 for POWER, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
  - These additional AIX levels are supported in an LPAR using virtualized I/O only:
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
  - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
  - IBM i 7..1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 with interim fix IV56366, or later

(#EN0S) - PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter

PCIe Gen2 x8 short Ethernet adapter supports Ethernet NIC (Network Interface Card) traffic. The adapter provides two 10 Gb SR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter.

The 10Gb ports are SFP+ and include optical SR transceivers. The ports have LC Duplex type connectors and utilize shortwave laser optics and MMF-850nm fiber cabling. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3 or OM4, up to 300 meter fiber cable lengths are supported.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0S and #EN0T adapters are electronically identical. They are physically identical except #EN0S has a tail stock for full high PCIe slots and #EN0T has a tail stock for low profile slots. The CCIN is 2CC3 for both features.

Details for the ports include:

- AIX NIM and LINUX NETWORK INSTALL are supported.
- IEEE 802.3ae (10GBASE-SR), IEEE 802.3ab (1000BASE-T GbE), IEEEu 802.3u (100BASE-T), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,

- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses/promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) RSS (Receive Side Scaling) support for IPv4, IPv6 and UDP for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i, and Linux provide software iSCSI support through the the adapter.
- Attributes provided: Four ports - two 10Gb and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - full high
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 and APAR IV56366 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 and APAR IV56367 or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 10 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 5 or later
  - AIX Version 6.1 with the 6100-07 Technology Level and service Pack 10 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 5 or later
  - SUSE Linux Enterprise 11 Service Pack 3, or later with current maintenance updates available from SUSE
  - Red Hat Enterprise Linux for POWER 6.5 or later with current maintenance updates available from Red Hat
  - Red Hat Enterprise Linux for POWER V7 or later with current maintenance updates available from Red Hat
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Assignment to the VIOS requires
  - VIOS 2.2.3.3 with ifix IV56366 or later
  - VIOS 2.2.2.5 or later
  - VIOS 2.2.1.9 or later

(#EN0T) - PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter

PCIe Gen2 x8 short Ethernet adapter supports Ethernet NIC (Network Interface Card) traffic. The adapter provides two 10 Gb SR optical ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter.

The 10Gb ports are SFP+ and include optical SR transceivers. The ports have LC Duplex type connectors and utilize shortwave laser optics and MMF-850nm fiber cabling. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3 or OM4, up to 300 meter fiber cable lengths are supported.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0S and #EN0T adapters are electronically identical. They are physically identical except #EN0S has a tail stock for full high PCIe slots and #EN0T has a tail stock for low profile slots. The CCIN is 2CC3 for both features.

Details for the ports include:

- AIX NIM and LINUX NETWORK INSTALL are supported.
- IEEE 802.3an (10GBASE-T), IEEE 802.3ab (1000BASE-T GbE), IEEEu (100BASE-T), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,

- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses/promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) RSS (Receive Side Scaling) support for IPv4, IPv6 and UDP for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter.
- Attributes provided: Four ports - two 10Gb and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - low profile
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EN0U) - PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter

PCIe Gen2 x8 short Ethernet adapter supports Ethernet NIC (Network Interface Card) traffic. The adapter provides two 10 Gb twinax copperl ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter.

The 10Gb ports are SFP+ and do not include a transceiver. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. A transceiver is included with these cables. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBase-T. Active cables differ from passive cables.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0U and #EN0V adapters are electronically identical. They are physically identical except #EN0U has a tail stock for full high PCIe slots and #EN0V has a tail stock for low profile slots. The CCIN is 2CC3 for both features.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IEEE 802.3ae (10 GbE),IEEE 802.3ab (1000BASE-T GbE), 100BASE-T IEEEu, 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses/promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter.
- Attributes provided: Four ports - two 10Gb and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - full high
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Supports PowerKVM and VIOS. Refer to Software Requirements for specific code levels supported.

(#EN0V) - PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter

PCIe Gen2 x8 short Ethernet adapter supports Ethernet NIC (Network Interface Card) traffic. The adapter provides two 10 Gb twinax copperl ports and two 1 Gb RJ45 ports in a PCIe 8x short form adapter.

The 10Gb ports are SFP+ and do not include a transceiver. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. A transceiver is included with these cables. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBase-T. Active cables differ from passive cables.

For the 1Gb RJ45 ports, 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable or higher is supported for distances of up to 100 meters. In addition to 1Gb (1000 Mb) networks, 100 Mb networks are also supported, but 10Mb networks are not supported.

#EN0U and #EN0V adapters are electronically identical. They are physically identical except #EN0U has a tail stock for full high PCIe slots and #EN0V has a tail stock for low profile slots. The CCIN is 2CC3 for both features.

Details for the ports include:

- AIX NIM and LINUX NETWORK INSTALL are supported.
- IEEE 802.3ae (10 GbE),IEEE 802.3ab (1000BASE-T GbE), 100BASE-T IEEEu, 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses/promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter.
- Attributes provided: Four ports - two 10Gb and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot - low profile
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - IBM i - not supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EN0W) - PCIe2 2-port 10/1GbE BaseT RJ45 Adapter

PCIe Gen2 short x8 adapter which provides two 10G-BaseT ports. The ports are RJ45. The ports default to auto negotiate the highest speed either 10Gb (10GBaseT), 1Gb (1000BaseT) or 100Mb (100BaseT) full duplex. Each RJ45 port's configuration is independent of the other. The adapter supports Ethernet NIC (Network Interface Card) traffic.

The RJ45 ports use 4-pair CAT-6A cabling for distances of up to 100 meters or CAT-6 cabling for distances up to 37 meters. CAT5 cabling is not tested and is not supported.

#EN0W and #EN0X are electronically identical with the same CCIN of 2CC4. #EN0W has a full high tail stock and #EN0X has a low profile tail stock.

Details for the ports include:

- AIX NIM and Linux Network Install are supported.
- IEEE 802.3an (10GBASE-T), IEEE 802.3ab (1000BASE-T GbE), IEEEu (100BASE-T), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,

- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses / promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt (MSI-X, MSI) support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO)
- RSS (Receive Side Scaling) support for IPv4, IPv6 and UDP.
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i, and Linux provide software iSCSI support through the the adapter.
- Attributes provided: Two 10G-BaseT ports
- Attributes required: PCIe Gen2 or Gen3 slot - full high
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 and APAR IV56366 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 and APAR IV56367 or later
  - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 10 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 5 or later
  - AIX Version 6.1 with the 6100-07 Technology Level and service Pack 10 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 5 or later
  - SUSE Linux Enterprise 11 Service Pack 3, or later with current maintenance updates available from SUSE
  - Red Hat Enterprise Linux for POWER 6.5 or later with current maintenance updates available from Red Hat
  - Red Hat Enterprise Linux for POWER V7 or later with current maintenance updates available from Red Hat
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Assignment to the VIOS requires
  - VIOS 2.2.3.3 with ifix IV56366 or later
  - VIOS 2.2.2.5 or later
  - VIOS 2.2.1.9 or later

(#EN0X) - PCIe2 LP 2-port 10/1GbE BaseT RJ45 Adapter

PCIe Gen2 short x8 adapter which provides two 10G-BaseT ports. The ports are RJ45. The ports default to auto negotiate the highest speed either 10Gb (10GBaseT), 1Gb (1000BaseT) or 100Mb (100BaseT) full duplex. Each RJ45 port's configuration is independent of the other. The adapter supports Ethernet NIC (Network Interface Card) traffic.

The RJ45 ports use 4-pair CAT-6A cabling for distances of up to 100 meters or CAT-6 cabling for distances up to 37 meters. CAT5 cabling is not tested and is not supported.

#EN0W and #EN0X are electronically identical with the same CCIN of 2CC4. #EN0W has a full high tail stock and #EN0X has a low profile tail stock.

Details for the ports include:

- AIX NIM and LINUX NETWORK INSTALL are supported.
- IEEE 802.3an (10GBASE-T), IEEE 802.3ab (1000BASE-T GbE), IEEEu (100BASE-T), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,

- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses / promiscuous mode (for PowerVM/VIOS) per interface
- Message Signalling Interrupt (MSI-X, MSI) support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- Jumbo frames up to 9.6 Kbytes
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO)
- RSS (Receive Side Scaling) support for IPv4, IPv6 and UDP.
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i, and Linux provide software iSCSI support through the the adapter.
- Attributes provided: Two 10G-BaseT ports
- Attributes required: PCIe Gen2 or Gen3 slot - low profile
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, Refer to Software Requirements for specific code levels supported.

(#EN0Y) - PCIe2 LP 8Gb 4-port Fibre Channel Adapter

(No longer available as of May 12, 2020)

PCIe Gen2 8 Gigabit quad port Fibre Channel Adapter is a low profile, high-performance 8x short form Host Bus Adapter (HBA). Each port provides single initiator capability over a fiber link or with NPIV, multiple initiator capability is provided. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiate to the highest speed possible. LEDs on each port provide information on the status and link speed of the port. CCIN is EN0Y. This adapter is based on the QLogic QLE2564 PCIe Host Bus Adapter (HBA).

The adapter connects to a Fibre Channel switch. Direct device attachment has not been tested and is not supported.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications:

```
OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables.

The following table shows the supported distances for the three different cable types at the three different link speeds.

```
Cable | 2.125 Gbps | 4.25 Gbps | 8.5 Gbps  |
------|------------|-----------|-----------|
OM3   |.5m - 500m  |.5m - 380m |.5m - 150m |
OM2   |.5m - 300m  |.5m - 150m |.5m - 50m  |
OM1   |.5m - 150m  |.5m - 70m  |.5m - 21m  |
```

A Gen2 or later PCIe slot is required to provide the bandwidth for all four ports to operate at full speed. Use in Gen1 slots has not been tested and is not supported.

The EN12 and EN0Y adapters are electronically and functionally identical. Feature EN12 indicates a full high tailstock bracket. Feature EN0Y indicates a low profile tailstock bracket.

Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: 4-port 8Gb Fibre Channel Adapter
- Attributes required: 1 Empty PCIe Gen2 or later slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
    - IBM i 7.1 TR11 or later supported via VIOS
    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#EN12) - PCIe2 8Gb 4-port Fibre Channel Adapter

(No longer available as of May 12, 2020)

PCIe Gen2 8 Gigabit quad port Fibre Channel Adapter is a high- performance 8x short form Host Bus Adapter (HBA). Each port provides single initiator capability over a fiber link or with NPIV, multiple initiator capability is provided. The ports have LC type connectors and use shortwave laser optics. The adapter operates at link speeds of 2, 4, and 8 Gbps and will automatically negotiate to the highest speed possible. LEDs on each port provide information on the status and link speed of the port. This adapter is based on the QLogic QLE2564 PCIe Host Bus Adapter (HBA).

The adapter connects to a Fibre Channel switch. Direct device attachment has not been tested and is not supported.

N_Port ID Virtualization (NPIV) capability is supported through VIOS.

Cables are the responsibility of the customer. Use multimode fibre optic cables with short-wave lasers that adhere to the following specifications: OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth

```
OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth
OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth
```

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables.

The following table shows the supported distances for the three different cable types at the three different link speeds. Cable |

```
2.125 Gbps | 4.25 Gbps | 8.5 Gbps |
------|-----------|-----------|----------|
OM3   |.5m - 500m |.5m - 380m |.5m - 150m|
OM2   |.5m - 300m |.5m - 150m |.5m - 50m |
OM1   |.5m - 150m |.5m - 70m  |.5m - 21m |
```

The EN12 and EN0Y adapters are electronically and functionally identical with the same CCIN of EN0Y. # EN12 indicates a full high tailstock bracket. #EN0Y indicates a low profile tailstock bracket.

Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

See also optional wrap plug feature #ECW0 which is:

- a) Required to run some diagnostic procedures and
- b) in some cases may speed system boot when placed in empty ports as well as avoid useless messages pointing to a planned empty port.
- Attributes provided: 4-port 8Gb Fibre Channel Adapter
- Attributes required: Available PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux Server 6.7, or later
    - Red Hat Enterprise Linux Server 7.1, big endian for Power, or later
    - Red Hat Enterprise Linux Server 7.1, little endian for Power, or later
    - SUSE Linux Enterprise Server 11, Service Pack 4, or later
    - SUSE Linux Enterprise Server 12, or later
    - Ubuntu Server 15.04, or later
    - Ubuntu Server 14.04.3, or later
    - IBM i supported with VIOS
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported.

(#EN15) - PCIe3 4-port 10GbE SR Adapter

This PCIe Gen3 supports Ethernet NIC (Network Interface Card) traffic and also supports SR-IOV capability. The adapter provides four 10 Gb SR optical ports in a PCIe 8x short form adapter. SR-IOV capability for the NIC function is supported with the appropriate firmware and OS level for any of the four ports. Enabling SR-IOV function requires an HMC.

The four 10Gb ports are SFP+ and include four optical SR transceivers. The ports have LC Duplex type connectors and utilize shortwave laser optics and MMF-850nm fiber cabling. With 62.5 micron OM1, up to 33 meter length fiber cables are supported. With 50 micron OM2, up to 82 meter fiber cable lengths are supported. With 50 micron OM3 or OM4, up to 300 meter fiber cable lengths are supported. p.#EN15 and #EN16 adapters are electronically identical. They are physically identical except #EN15 has a tail stock for full high PCIe slots and #EN16 has a tail stock allowing it to fit in a Power E870/E880 system node PCIe slot. The CCIN is 2CE3 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking

- Attributes provided: Four 10GbE ports
- Attributes required: full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
  - Ubuntu Server 14.04.03, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later.

(#EN17) - PCIe3 4-port 10GbE SFP+ Copper Adapter

(No longer available as of December 31, 2020)

This PCIe Gen3 supports Ethernet NIC (Network Interface Card) traffic and also supports SR-IOV capability. The adapter provides four 10GbE SFP+ ports into which copper twinax transceivers will be placed. It is a PCIe 8x short form adapter. SR-IOV capability for the NIC function is supported with the appropriate firmware and OS level for any of the four ports. Enabling SR-IOV function requires an HMC.

The 10Gb ports are SFP+ and do not include a transceiver. Active Copper twinax cables up to 5 meter in length are supported such as provided by feature #EN01, #EN02 or #EN03. A transceiver is included with these cables. Note that SFP+ twinax copper is NOT AS/400 5250 twinax or CX4 or 10 GBase-T. Active cables differ from passive cables. p.#EN17 and #EN18 adapters are electronically identical. They are physically identical except #EN17 has a tail stock for full high PCIe slots and #EN18 has a tail stock allowing it to fit in a Power E870/E880 system node PCIe slot. The CCIN is 2CE4 for both features.

Details for the ports include:

- AIX NIM support
- IEEE 802.3ae (10 GbE), 802.1p priority, 802.1Q VLAN tagging, 802.3x flow control, 802.3ad load-balancing and failover,
- Link aggregation, IEEE 802.3ad 802.3
- Multiple MAC addresses per interface
- MSI-X, MSI and support of legacy pin interrupts
- Ether II and IEEE 802.3 encapsulated frames
- TCP checksum offload for IPv4 and IPv6
- TCP segmentation Offload (TSO) for IPv4 and IPv6
- UDP checksum offload for IPv4 and IPv6
- AIX, IBM i and Linux provide software iSCSI support through the adapter. Linux can also leverage adapter hardware support including initiator and header & data digest (CRC) generation and checking
- Attributes provided: Four 10GbE ports
- Attributes required: full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level and service pack 5 and APAR IV68443 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 5 and APAR IV68444 or later
  - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 7 or later (planned availability 9/30/2015)
  - AIX Version 6.1 with the 6100-08 Technology Level and service Pack 7 or later (planned availability 9/30/2015)
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 6.6, or later
  - Red Hat Enterprise Linux 7.1, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.51 or later.

(#EN27) - 2 Port Async EIA-232 PCIe Adapter

(No Longer Available as of March 11, 2016)

Adapter provides connection for 2 asynchronous EIA-232 devices. Ports are programmable to support EIA-232 protocols, at a line speed of 128K bps. Two RJ45 connections are located on the rear of the adapter. To attach to devices using a 9-pin (DB9) connection, use an RJ45-to-DB9 converter. For convenience, one converter is included with this feature. One converter for each connector needing a DB9 connector is needed.

The converter cable shipped with the feature is a 10-pin RJ-45 approximately 30 cm or 1 foot in length. 10-pin is often used for DCE devices like modems. DTE devices may be able to use fewer pin connections. Multiple RJ-45 pin out options are used and sold across the industry. The #3930 feature provides an 8-pin RJ45-to-DB9 converter cable. If an addition 10-pin RJ45-to-DB9 connector like the cable provided with the adapter is desired, it is commonly available from multiple sources and identified as a serial cable with a Digi part number 76000239. It is also possible to look up the cable's pin out specifications and build your own cables.

Note #EN27 and # EN28 are physically and electrically identical adapters, except for the type of PCIe slot used (full-high or low profile).

- Attributes provided: 2-Port Asynchronous EIA-232 via 2x RJ45 connectors, one RJ45-to-DB9 converter cable..
- Attributes required: 1 full high PCIe Slot
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux 6.5, or later
    - SUSE Linux Enterprise Server 11 Service Pack 3, or later
    - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EN28) - PCIe LP 2-Port Async EIA-232 Adapter

(No Longer Available as of February 9, 2016)

Adapter provides connection for 2 asynchronous EIA-232 devices. Ports are programmable to support EIA-232 protocols, at a line speed of 128K bps. Two RJ45 connections are located on the rear of the adapter. To attach to devices using a 9-pin (DB9) connection, use an RJ45-to-DB9 converter. For convenience, one converter is included with this feature. One converter for each connector needing a DB9 connector is needed.

The converter cable shipped with the feature is a 10-pin RJ-45 approximately 30 cm or 1 foot in length. 10-pin is often used for DCE devices like modems. DTE devices may be able to use fewer pin connections. Multiple RJ-45 pin out options are used and sold across the industry. The #3930 feature provides an 8-pin RJ45-to-DB9 converter cable. If an addition 10-pin RJ45-to-DB9 connector like the cable provided with the adapter is desired, it is commonly available from multiple sources and identified as a serial cable with a Digi part number 76000239. It is also possible to look up the cable's pin out specifications and build your own cables.

Note #EN27 and #EN28 are physically and electrically identical adapters, except for the type of PICe Slot used (full-high or low profile).

- Attributes provided: 2-Port Asynchronous EIA-232 via 2x RJ45 connectors, one RJ45-to-DB9 converter cable.
- Attributes required: 1 Low Profile (LP) slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 6.5 for POWER, or later
    - Red Hat Enterprise Linux 7 for POWER, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, with APAR IV56367, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3, with APAR IV56366, or later
    - These additional AIX levels are supported in an LPAR using virtualized I/O only:
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-02 Technology Level and Service Pack 1, or later
    - AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1, or later
    - AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPAA) - HVDC PDU - 90A 6xOutlet

(No longer available as of July 23, 2019)

Feature ships a high voltage dc (HVDC) Power Distribution Unit (PDU) with six customer-usable Rong Feng RF-203P outlets. Each outlet is rated at up to 10 amp and has its own circuit breaker. The PDU is most typically used for 380 volt configurations, but is rated for 240-380 volt. The PDU is rated for 90 amps. The PDU comes with a permanently attached 4.3 m (14 ft) line cord which is un-terminated (no plug) which must be directly wired into a HVDC power source.

The PDU can be either vertically mounted in rack side pockets or horizontally mounted. Using the feature #EBA5 mounting specify communicates to IBM manufacturing it should be horizontally mounted. If horizontally mounted, the PDU uses 1U rack space and makes accessing power cords much easier.

Use HVDC power cords ordered with the server or I/O drawer to plug into the PDU RF-203P outlets. See HVDC power cord features #EPAD or #EPAC.

If ordering this PDU with a 7014-T00 or 7014-T42 rack which is being shipped from IBM at the same time, see PDU feature #EPAF (HVDC PDU - 90A 6xOutlet Alternate Base).

Limitation:

- Not supported in North America
- IBM Manufacturing does not factory integrate AC and DC PDUs in the same rack
- Customers mixing AC and DC in the same rack must carefully follow power wiring guidelines
- Attributes provided: HVDC PDU
- Attributes required: HVDC power supplies and power cords on the server or I/O drawer
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPAC) - Auto Selected HVDC Power Cord

(No longer available as of February 28, 2019)

This feature ships a high voltage dc (HVDC) power cord which is 1.0M, 1.5M or 2.5M in length. The specific length will be selected by IBM Manufacturing when the system is being manufactured. Cord is connected to an HVDC PDU and to a HVDC power supply in a server or I/ O drawer. Cord has two Rong Feng RF-203P plugs, one at each end. Cord is 3 connector 1.3 mm2 gauge or 16 AWG and is rated for 10 amp and 192-400 volt dc Order one feature #EPAC for each HVDC power supply in the server or I/O drawer.

See feature #EPAD to specify a 2.5 meter (8 foot) HVDC cable and not have IBM Manufacturing select a length. There are no feature codes to specify a 1.0M or 1.5M cord.

- Attributes provided: HVDC power cord
- Attributes required: HVDC power supply
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#EPAD) - 2.5 Meter HVDC Power Cord

(No longer available as of January 17, 2020)

2.5 meter (8 foot) high voltage dc (HVDC) power cord. Cord is connected to an HVDC PDU and to a HVDC power supply in a server or I/ O drawer. Cord has two Rong Feng RF-203P plugs, one at each end. Cord is 3 conductor,1.3 mm2 gauge or 16 AWG and is rated for 10 amp and 192-400 volt dc For other length HVDC power cords, see feature #EPAC.

- Attributes provided: HVDC power cord
- Attributes required: HVDC power supply
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPNA) - 570 Processor Days Activation for #EPWA/ESYA

One #EPNA provides 570 processor days activation for Configuration Code #EPWA/ESYA.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWA/ESYA
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - Red Hat Enterprise Linux 6.5 or later
  - Red Hat Enterprise Linux 7 or later
  - SUSE Linux Enterprise Server 11 Service Pack 3 or later
  - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Maximum allowed on a single order is 17.

(#EPNB) - 570 Processor Days Activation for #EPWB/ESYB

One #EPNB provides 570 processor days activation for Configuration Code #EPWB/ESYB.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWB/ESYB
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - Red Hat Enterprise Linux 6.5 or later
  - Red Hat Enterprise Linux 7 or later
  - SUSE Linux Enterprise Server 11 Service Pack 3 or later
  - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Maximum allowed on a single order is 17.

(#EPNC) - 570 Processor Days Activation for #EPWC/ESYC

One #EPNC provides 570 processor days activation for Configuration Code #EPWC/ESYC.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWC/ESYC
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - Red Hat Enterprise Linux 6.5 or later
  - Red Hat Enterprise Linux 7 or later
  - SUSE Linux Enterprise Server 11 Service Pack 3 or later
  - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Maximum allowed on a single order is 17.

(#EPND) - 570 Processor Days Activation for #EPWD/ESYD

One #EPND provides 570 processor days activation for Configuration Code #EPWD/ESYD.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWD/ESYD
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: Maximum allowed on a single order is 17.

(#EPNE) - 570 Processor Days Activation for #EPWE/ESYE

One #EPNE provides 570 processor days activation for Configuration Code #EPWE/ESYE.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWE/ESYE
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: Maximum allowed on a single order is 17.

(#EPNF) - 570 Processor Days Activation for #EPWF/ESYF

One #EPNF provides 570 processor days activation for Configuration Code #EPWF/ESYF.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWF/ESYF
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
  - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPNG) - 570 Processor Days Activation for #EPWG/ESYG

One #EPNG provides 570 processor days activation for Configuration Code #EPWG/ESYG.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWG/ESYG
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
- IBM i
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPNH) - 570 Processor Days Activation for #EPWH/ESYH

One #EPNH provides 570 processor days activation for Configuration Code #EPWH/ESYH.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWH/ESYH
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
- IBM i
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPNJ) - 570 Processor Days Activation for #EPWJ/ESYJ

One #EPNJ provides 570 processor days activation for Configuration Code #EPWJ/ESYJ.

- Attributes provided: 570 processor days activation
- Attributes required: Configuration Code EPWJ/ESYJ
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 17)
- OS level required:
- IBM i
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPTH) - Horizontal PDU Mounting Hardware

This feature ships the hardware required to properly horizontally mount one #EPTG/EPTJ, #EPTK/EPTL, #EPTM/EPTN or #EPTP/EPTQ PDU in a 1U 19-inch rack. A 1U blank panel for the front of the rack for air-flow control is included.

Without this hardware, the PDU can be mounted vertically in the rack's side pockets, but can only be poorly mounted horizontally. The front end of the PDU will be firmly attached to the rear of the rack. But the front of the PDU will be unsupported toward the middle of the rack. Without this hardware, the unsupported end of the PDU will rest on the hardware mounted immediately below it. If that underlying hardware is removed from the rack there is no support for the PDU.

Important Note: This feature code is typically used for an MES order and not for an original order of a new rack with #EPTn PDUs. As part of factory integration, IBM Manufacturing automatically adds this hardware without a feature code and at no additional charge when its #EPTn PDU placement logic calls for horizontally mounted PDUs. Use this feature code when (1) converting an existing vertically mounted #EPTn PDU to horizontal mounting or (2) separately ordering a #EPTn PDU for horizontal field installation.

- Attributes provided: mounting hardware
- Attributes required: High Function PDU (#EPT*) and space in 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPTJ) - High Function 9xC19 PDU

(No longer available as of April 24, 2020)

Switched, Monitoring

This is an intelligent, switched 200-240 volt AC Power Distribution Unit (PDU) with nine C19 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the nine C19 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Depending on country wiring standards the PDU is single-phase or three-phase wye. See three-phase #EPTK/EPTL for countries which do not use wye wiring.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, and #6667.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are generally not easily accessed and therefore IBM does not generally recommend their use.

#EPTG and #EPTJ are identical PDUs. Up to one lower price #EPTG can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #7189 PDU

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Nine C19 PDU - switched, power monitoring
- Attributes required: PDU wall line cord & space in 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPTL) - High Function 9xC19 PDU 3-Phase

(No longer available as of April 24, 2020)

Switched, Monitoring

This is an intelligent, switched 208 volt 3-phase AC Power Distribution Unit (PDU) with nine C19 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the nine C19 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One wall line cord is provided with the PDU (no separate feature code) and has a IEC60309 60A plug (3P+G). The PDU supports up to 48 amps.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are generally not easily accessed and therefore IBM does not generally recommend their use.

#EPTK and #EPTL are identical PDUs. Up to one lower price #EPTK can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #7196 PDU

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Nine C19 PDU - switched, power monitoring
- Attributes required: space in rack, 3-phase 208V AC delta electrical service
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPTN) - High Function 12xC13 PDU

(No longer available as of April 24, 2020)

Switched, Monitoring

This is an intelligent, switched 200-240 volt AC Power Distribution Unit (PDU) with twelve C13 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the twelve C13 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker. Depending on country wiring standards the PDU is single-phase or three-phase wye. See three-phase #EPTK/EPTL for countries which do not use wye wiring.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C14 plug connect to C13 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, and #6667.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

#EPTM and #EPTN are identical PDUs. Up to one lower price #EPTM can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #7109 PDU

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Twelve C13 PDU - switched, power monitoring
- Attributes required: PDU wall line cord & space in 19-inch rack
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPTQ) - High Function 12xC13 PDU 3-Phase

(No longer available as of April 24, 2020)

Switched, Monitoring

This is an intelligent, switched 208 volt 3-phase AC Power Distribution Unit (PDU) with twelve C13 receptacles on the front of the PDU. The PDU is mounted on the rear of the rack making the twelve C13 receptacles easily accessible. Each receptacle has a 20 amp circuit breaker.

The PDU can be mounted vertically in rack side pockets or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. See feature #EPTH for horizontal mounting hardware.

Device power cords with a C14 plug connect to C13 PDU receptacles and are ordered separately. One wall line cord is provided with the PDU (no separate feature code) and has a IEC60309 60A plug (3P+G). The PDU supports up to 48 amps.

Two RJ45 ports on the front of the PDU enable the client to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off. The PDU is shipped with a generic PDU password and IBM strongly urges clients to change it upon installation.

#EPTP and #EPTQ are identical PDUs. Up to one lower price #EPTP can be ordered with a new 7014-T42/T00 rack in place of a no-charge #9188 PDU.

For comparison, this is most similar to the earlier generation #7196 PDU, but offers C13 receptacles

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Twelve C13 PDU - switched, power monitoring
- Attributes required: space in rack, 3-phase 208V AC delta electrical service
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPWA) Small Linux Configuration - 2 10-core 3.42GHz Processors, 256 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 256 GB (16x16GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping 1 Handling. Linux required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux 6.5 or later
  - Red Hat Enterprise Linux 7 or later
  - SUSE Linux Enterprise Server 11 Service Pack 3 or later
  - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWB) Medium Linux Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 512 GB (16x32GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping 1 Handling. Linux required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - Red Hat Enterprise Linux 6.5 or later
    - Red Hat Enterprise Linux 7 or later
    - SUSE Linux Enterprise Server 11 Service Pack 3 or later
    - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWC) Large Linux Configuration - 2 10-core 3.42 GHz Processors, 1 TB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 1 TB (16x64GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping 1 Handling. Linux required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - Red Hat Enterprise Linux 6.5 or later
    - Red Hat Enterprise Linux 7 or later
    - SUSE Linux Enterprise Server 11 Service Pack 3 or later
    - Ubuntu Linux 15.04 or later
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWD) Small AIX Configuration - 2 10-core 3.42 GHz Processors, 256 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 256 GB (16x16GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handling. AIX required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWE) Medium AIX Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 512 GB (16x32GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handlling. AIX required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWF) Large AIX Configuration - 2 10-core 3.42 GHz Processors, 1 TB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 1 core activated, 1 TB (16x64GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handling. AIX required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX Standard Edition 7.1, and 7.2 supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWG) - Small IBM i Configuration - 2 10-core 3.42GHz Processors, 256 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 2 cores activated, 256 GB (16x16GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handling. IBM i required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR4 or later supported with VIOS
  - IBM i 7.3 or later supported with VIOS
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWH) - Medium IBM i Configuration - 2 10-core 3.42 GHz Processors, 512 GB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 2 cores activated, 512 GB (16x32GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handling. IBM i required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR4 or later supported with VIOS
  - IBM i 7.3 or later supported with VIOS
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPWJ) - Large IBM i Configuration - 2 10-core 3.42 GHz Processors, 1 TB Memory, 300 GB HDD

(No longer available as of February 28, 2019)

Ordering this feature will deliver a configuration containing 2 10-core 3.42 GHz processors with 2 cores activated, 1 TB (16x64GB DIMMs) of memory, a 300 GB HDD, two power supplies, and Shipping & Handling. IBM i required.

- Attributes provided: Specific configuration
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR4 or later supported with VIOS
  - IBM i 7.3 or later supported with VIOS
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EPX1) - 6-core 3.89 GHz POWER8 Processor Card

6-core 3.891 GHz POWER8 processor card. Available in quantities of one or two.

- Attributes provided: 6-core processor card.
- Attributes required: One processor card slot.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPXD) - 10-core 3.42 GHz POWER8 Processor Card

10-core 3.425 GHz POWER8 processor card, available in quantities of one or two.

- Attributes provided:
  10-core processor card.

- Attributes required:
  One processor card slot.

- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPXL) - 8-core 4.1 GHz POWER8 Processor Card

8-core 4.157 GHz POWER8 processor card, available in quantities of one or two.

- Attributes provided: 8-core processor card.
- Attributes required: One processor card slot.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Aix - supported
  - Linux - supported
  - Refer the Software requirements for the OS levels.
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPXN) - 4-Core 3.02 GHz POWER8 Processor Card

4-core 3.02 GHz POWER8 processor card.

- Attributes provided: 4-core processor card
- Attributes required: One processor card slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - IBM i - not supported
  - Linux - not supported
  Refer to Software Requirements for specific O/S levels supported

- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPY1) - One Processor Core Activation for #EPX1

Entitlement for one processor core activation

- Attributes provided:
  Processor core activation for #EPX1.

- Attributes required:
  Feature #EPX1.

- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPYD) - One Processor Core Activation for #EPXD

Entitlement for one processor core activation

- Attributes provided:
  Processor core activation for #EPXD.

- Attributes required:
  Feature #EPXD.

- Minimum required: 0
- Maximum allowed: 20 (Initial order maximum: 20)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPYL) - One Processor Core Activation for #EPXL

Entitlement for one processor core activation

- Attributes provided: Processor core activation for #EPXL.
- Attributes required: Feature #EPXL.
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
  - Aix - supported
  - Linux - supported
  - Refer the Software requirements for the OS levels.
  - IBM i 7.1 TR11 or later supported via VIOS
  - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPYN) - One Processor Core Activation for #EPXN

Entitlement for one processor core activation.

- Attributes provided: One Processor core activation for #EPXN
- Attributes required: Feature EPXN
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - IBM i - not supported
  - Linux - not supported
  Refer to Software Requirements for specific O/S levels supported

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ02) Quantity 150 of #3452 SAS YO Cable 6m - HD 6Gb Adapter to Enclosure

(No longer available as of December 31, 2020)

This feature provides 150 cables of feature 3452 which is a 6 meter SAS cable that connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887/EL1S EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors.
- Attributes required: Available connectors on SAS controller and SAS I/O drawer.
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ03) Quantity 150 of #3453 SAS YO Cable 10m - HD 6Gb Adapter to Enclosure

This feature provides 150 10 meter SAS cables that connects a SAS adapter to a SAS I/O enclosure. This YO cable has three connectors, one Mini-SAS HD (High Density)connector and two Mini SAS connectors. The Mini-SAS HD connector attaches to a SAS adapter such as the #5913 1.8GB RAID SAS Adapter. Both Mini SAS connectors attach to the same I/O drawer (enclosure) such as a #5887/EL1S EXP24S SAS I/O drawer. This cable can support up to 6Gb throughput.

Multiple cable length feature codes are available. Choose the cable length that best matches the distance between the adapter and the SAS I/O drawer.

- Attributes provided: connection between SAS adapter with Mini-SAS HD connectors and a SAS I/O drawer with Mini SAS connectors
- Attributes required: Available connectors on SAS controller and SAS I/O drawer
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ0C) - Quantity of 150 #ES0C

This feature ships a quantity of 150 #ES0C disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity of 150 #ES0C
- Attributes required: See Feature ES0C
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQ0G) - Quantity 150 of #ES0G (775GB SSD SFF-2)

(No Longer Available as of August 31, 2017)

This feature ships a quantity of 150 #ES0G disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity of 150 #ES0G
- Attributes required: See Feature ES0G
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ0Q) - Quantity 150 of #ES0Q 387GB SFF-2 4k SSD (AIX/Linux)

(No Longer Available as of August 31, 2017)

This feature ships a quantity 150 of #ES0Q SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity of 150 #ES0Q
- Attributes required: See #ES0Q
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - AIX - supported
  - Linux - supported
  - See feature ES0Q for OS level
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ0S) - Quantity 150 of #ES0S 775GB SFF-2 4k SSD (AIX/Linux)

(No Longer Available as of August 31, 2017)

This feature ships a quantity 150 of #ES0S SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: Quantity of 150 #ES0S
- Attributes required: See #ES0S
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Linux supported
  - AIX 6.1 and 7.1 or later supported
  - IBM i not supported
  - Refer feature ES0S for O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ19) - Quantity 150 of #ES19 (387GB SSD SFF-2)

(No Longer Available as of August 31, 2017)

This feature ships a quantity of 150 #ES19 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity of 150 #ES19
- Attributes required: See Feature ES19
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ52) - Quantity 150 of #1752 (900GB SFF-2 disk)

(No Longer Available as of January 20, 2017)

This feature ships a quantity of 150 #1752 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: see feature #1752
- Attributes required: see feature #1752
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ62) - Quantity 150 of #ES62 3.86-4.0 TB 7200 rpm 4k LFF-1 Disk

This feature ships a quantity of 150 #ES62 drives. The configurator may either generate this feature or allow users to select this feature as they would any other single drive feature. This feature remains on the inventory records.

- Attributes provided: 150 enterprise nearline drives
- Attributes required: 150 open LFF (3.5-inch) bays in EXP12SX Storage Enclosure
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ64) - Quantity 150 of #ES64 7.72-8.0 TB 7200 rpm 4k LFF-1

Disk

This feature ships a quantity of 150 #ES64 drives. The configurator may either generate this feature or allow users to select this feature as they would any other single drive feature. This feature remains on the inventory records.

- Attributes provided: 150 enterprise nearline drives
- Attributes required: 150 open LFF (3.5-inch) bays in EXP12SX Storage Enclosure
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ78) - Quantity 150 of #ES78 387GB SFF-2 SSD 5xx

(No longer available as of January 18, 2019)

This feature ships a quantity of 150 #ES78 solid state drives (SSDs). The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: See feat #ES78
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: Refer to feature #ES78
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ7E) - Quantity 150 of #ES7E 775GB SFF-2 SSD 5xx

(No longer available as of January 18, 2019)

This feature ships a quantity of 150 #ES7E solid state drives (SSDs). The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: See feat #ES7E
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: Refer to feature #ES7E
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ80) - Quantity 150 of #ES80 1.9TB SFF-2 SSD 4k

(No longer available as of January 23, 2018.)

This feature ships a quantity of 150 #ES80 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: see feature #ES80
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - See #ES80 for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ85) - Quantity 150 of #ES85 387GB SFF-2 SSD 4k

This feature ships a quantity of 150 #ES85 solid state drives (SSDs). The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: See feat #ES85
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: Refer to feature #ES85
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ8C) - Quantity 150 of #ES8C 775GB SFF-2 SSD 4k

This feature ships a quantity of 150 #ES8C solid state drives (SSDs). The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: See feat #ES8C
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: Refer to feature #ES8C
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ8F) - Quantity 150 of #ES8F 1.55TB SFF-2 SSD 4k

This feature ships a quantity of 150 #ES8F solid state drives (SSDs). The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: Ships 150 SSDs
- Attributes required: See feat #ES8F
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: Refer to feature #ES8F
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ8Y) - Quantity 150 of #ES8Y 931GB SFF-2 SSD 4k

This feature ships a quantity of 150 #ES8Y SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ES8Y
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: see feature ES8Y
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ96) - Quantity 150 of ES96 1.86TB SFF-2 SSD 4k

This feature ships a quantity of 150 #ES96 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ES96
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: see feature ES96
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQD3) - Quantity 150 of #ESD3 (1.2TB 10k SFF-2)

This feature ships a quantity of 150 #ESD3 1.2TB SAS 10K SFF-2 disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature #ESD3
- Attributes required: 150 SFF-2 SAS bays in EXP24S drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQDP) Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/LINUX)

(No longer available as of December 31, 2020)

This feature ships a quantity 150 of #ESDP drive. The configurator may either generate this feature or allow users to select this feature as they would any other single disk drive feature. This feature remains on the inventory records.

- Attributes provided: Quantity 150 of #ESDP
- Attributes required: See #ESDP
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQE7) - Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k

This feature ships a quantity of 150 #ESE7 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESE7
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: see feature ESE7
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQEV) - Quantity 150 of #ESEV (600GB 10k SFF-2)

This feature ships a quantity of 150 #ESEV, 600GB 10K RPM 4K SAS SFF-2 Disk, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESEV
- Attributes required: 150 SFF-2 SAS bays in EXP24S drawers
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQEZ) - Quantity 150 of #ESEZ (300GB SFF-2)

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ESEZ disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity of 150 #ESEZ
- Attributes required: See #ESEZ
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQF3) - Quantity 150 of #ESF3 (1.2TB 10k SFF-2)

This feature ships a quantity of 150 #ESF3, 1.2TB 10K RPM 4K SAS SFF-2 Disk, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESF3
- Attributes required: 150 SFF-2 SAS bays in EXP24S drawers
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQFP) - Quantity 150 of #ESFP (600GB SFF-2)

(No longer available as of April 24, 2020)

his feature ships a quantity 150 of #ESFP disk units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records

- Attributes provided: Quantity 150 of #ESFP
- Attributes required: See #ESFP
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQFT) - Quantity 150 of #ESFT (1.8TB 10k SFF-2)

This feature ships a quantity of 150 #ESFT 1.8TB 10K RPM 4K SAS SFF-2, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESFT
- Attributes required: 150 SFF-2 SAS bays in EXP24S drawers
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQG5) - Quantity 150 of #ESG5 (387GB SAS 5xx)

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESG5 387 GB, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESG5
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQGB) - Quantity 150 of #ESGB (387GB SAS 4k)

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESGB 387 GB, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESGB
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQGF) - Quantity 150 of #ESGF (775GB SAS 5xx)

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESGF 775 GB, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESGF
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQGK) - Quantity 150 of #ESGK (775GB SAS 4k)

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESGK 775 GB, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESGK
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQGP) - Quantity 150 of #ESGP (1.55TB SAS 4k)

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESGP 1.55 TB, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

- Attributes provided: See feature#ESGP
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ER05) - 42U Slim Rack

(No longer available as of January 17, 2020)

Provides a 19-inch, 2.0 meter high rack with 42 EIA units of total space for installing rack mounted CECs and/or expansion units. The 600mm wide rack fits within a data center's 24" floor tiles and provides better thermal and cable management capabilities. The ER05 rack does not come equipped with a standard front door, rear door or side covers. The following features are required on the #ER05:

- #EC01 front door
- #EC02 rear door or #EC15 Rear Door Heat Exchanger (RDHX) indicator

The following optional features are offered on the ER05 rack.

- EC03 - Rack Side Cover Kit. Note: If EC15 (rear door heat exchanger) is ordered with ER05 then EC03 is required.
- EC04 - Rack Suite attachment Kit

Power Distribution Units (PDU) on the rack are optional. Each PDU consumes one of six vertical mounting bays and every vertically mounted PDU requires #ELC0. Each PDU beyond six will consume 1U of rack space.

- Attributes provided: 19 inch, 2.0M, 42 EIA Rack
- Attributes required: #EC01 front door, #EC02 rear door or #EC05 #EC15 RDHX indicator
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ER2C) - Water Cooling of Processor Module

(No longer available as of February 28, 2019)

Feature ships water cooling hardware above the POWER processor module in place of air cooling fins. Water cooling is more efficient cooling than air. With water cooling, additional memory and I/O options can be supported which are otherwise limited on 8-core 4.1GHz processor modules. Water lines carrying cool water in and warm water out use the PCIe C5 slot. A PCIe adapter can not be placed in this slot when water cooling is installed. This feature installed in the system unit when the server is manufactured and is not installed in the field.

- Attributes provided: Water cooling hardware and an indicator to configuration system that a PCIe slot is used.
- Attributes required: Empty C5 PCIe slot, connection to water supply/return
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ER94) - Quantity 150 of ES94 387GB SAS 4k

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ES94 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ES94
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ES94
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERB0) - Bulk Packaging Request ID

(No longer available as of February 28, 2019)

This indicator is used to optimize package density of 2u server shipments through the use of bulk packaging.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Bulk packaging from the IBM factory to the customer.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB1) - Bulk Packaging ID #1

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #1.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB2) - Bulk Packaging ID #2

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #2.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB3) - Bulk Packaging ID #3

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #3.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB4) - Bulk Packaging ID #4

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #4.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB5) - Bulk Packaging ID #5

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #5.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB6) - Bulk Packaging ID #6

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #6.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB7) - Bulk Packaging ID #7

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #7.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB8) - Bulk Packaging ID #8

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #8.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERB9) - Bulk Packaging ID #9

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #9.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBA) - Bulk Packaging ID #10

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #10.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBB) - Bulk Packaging ID #11

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #11.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBC) - Bulk Packaging ID #12

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #12.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBD) - Bulk Packaging ID #13

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #13.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBE) - Bulk Packaging ID #14

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #14.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBF) - Bulk Packaging ID #15

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #15.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBG) - Bulk Packaging ID #16

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #16.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBH) - Bulk Packaging ID #17

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #17.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBJ) - Bulk Packaging ID #18

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #18.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBK) - Bulk Packaging ID #19

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #19.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBL) - Bulk Packaging ID #20

(No longer available as of February 28, 2019)

This indicator is used to specify that servers will be bulk packaged for shipment in package identifier #20.
Note: Bulk packaging would be defaulted via a specify code on the order for any customer order that contains 2 or more servers (except for MTM's 8001-12C and 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).

Limitations: There will be no mixing of MTMs with in the bulk packaging.

- Attributes provided: Multiple servers in 1 package.
- Attributes required: Order that contains 2 or more servers (except for MTM's 8001-12C and MTM 8001-22C, bulk packaging can be supported for customer order that contains 5 or more servers for MTM 8001-12C and 4 or more servers for MTM 8001-22C).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERBZ) - No Bulk Packaging Specify

(No longer available as of February 28, 2019)

This indicator is used to indicate single packaging will be used and not allow for bulk packaging.

- Attributes provided: Single packages
- Attributes required: Single customer orders.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERGV) - Quantity 150 of ESGV 387GB SSD 4k

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ESGV SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESGV
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESGV
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERGZ) - Quantity 150 of ESGZ 775GB SSD 4k

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ESGZ SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESGZ
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESGZ
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERHJ) - Quantity 150 of #ESHJ 931 GB SSD 4k SFF-2

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESHJ SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESHJ
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: See feature ESHJ
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERHL) - Quantity 150 of #ESHL 1.86 TB SSD 4k SFF-2

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESHL SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESHL
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: See feature ESHL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERJ0) - Quantity 150 of ESJ0 931GB SAS 4k

This feature ships a quantity of 150 #ESJ0 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESJ0
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESJ0
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERJ2) - Quantity 150 of ESJ2 1.86TB SAS 4k

This feature ships a quantity of 150 #ESJ2 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESJ2
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESJ2
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERJ4) - Quantity 150 of ESJ4 3.72TB SAS 4k

This feature ships a quantity of 150 #ESJ4 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESJ4
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESJ4
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERM8) - Quantity 150 of #ESM8 3.72 TB SSD 4k SFF-2

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESM8 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESM8
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: see feature ESM8
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERNA) - Quantity 150 of ESNA 775GB SSD 4k

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ESNA SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESNA
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESNA
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ERNE) - Quantity 150 of ESNE 1.55TB SSD 4k

(No longer available as of December 31, 2020)

This feature ships a quantity of 150 #ESNE SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESNE
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature #ESNE
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ES0Q) - 387GB SFF-2 4K SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 3875GB capacity formatted with 4K byte sectors (4224 bytes). The drive is supported in Gen2 SAS bays (SFF-2) provided in an EXP24S drawer (#5887).

#ES0Q (for AIX/LInux/VIOS) and #ES0R (for IBM i) are identica and have the same CCINI, but have different feature numbers to help IBM configuration tools understand their planned usage.

Limitations: This drive cannot be placed in the same array with a drive formatted with 528 byte sectors. Also JBOD mode (4096 byte sectors) is not supported.

- Attributes provided: 4K byte formatted 387GB SFF Gen2 SSD eMLC
- Attributes required: Available GEN2 SAS bay
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
    - Linux supported
    - AIX 6.1 and 7.1 or later supported
    - IBM i not supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0S) - 775GB SFF-2 4k SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 7755GB capacity formatted with 4K byte sectors (4224 bytes). The drive is supported in Gen2 SAS bays (SFF-2) provided in an EXP24S drawer (#5887).

#ES0S (for AIX/LInux/VIOS) and #ES0T (for IBM i) are identical and have the same CCIN, but have different feature numbers to help IBM configuration tools understand their planned usage.

Limitations: This drive cannot be placed in the same array with a drive formatted with 528 byte sectors. Also JBOD mode (4096 byte sectors) is not supported.

- Attributes provided: 4K byte formatted 775GB SFF Gen2 SSD eMLC
- Attributes required: Available SFF GEN2 bay
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
    - Linux supported
    - AIX 6.1 and 7.1 or later supported
    - IBM i not supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0U) - 387GB SFF-3 4k SSD AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387GB capacity formatted with 4K byte sectors (4224 bytes). The drive is supported in Gen3 SAS bays (SFF-3) provided in a POWER8 system unit.

#ES0U (for AIX/LInux/VIOS) and #ES0V (for IBM i) are identical and have the same CCIN, but have different feature numbers to help IBM configuration tools understand their planned usage.

Limitations: This drive cannot be placed in the same array with a drive formatted with 528 byte sectors. Also JBOD mode (4096 byte sectors) is not supported.

- Attributes provided: 4K byte formatted 387GB SFF Gen3 SSD eMLC
- Attributes required: Available SAS Gen3 bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0W) - 775GB SFF-3 4k SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 7755GB capacity formatted with 4K byte sectors (4224 bytes). The drive is supported in Gen3 SAS bays (SFF-3) provided in a POWER8 system unit.

#ES0W (for AIX/LInux/VIOS) and #ES0X (for IBM i) are identical and have the same CCIN, but have different feature numbers to help IBM configuration tools understand their planned usage.

Limitations: This drive cannot be placed in the same array with a drive formatted with 528 byte sectors. Also JBOD mode (4096 byte sectors) is not supported.

- Attributes provided: 4K byte formatted 775GB SFF Gen3 SSD eMLC
- Attributes required: Available SAS Gen3 bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Linux supported
  - AIX 6.1 and 7.1 or later supported
  - IBM i not supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0Y) - 177 GB 1.8" 4k SSD Read Intensive for AIX/Linux

(No Longer Available as of October 27, 2017)

The 177 GB 1.8" SAS Solid State Drive (SSD) provides 4K (4224 byte) sectors for high performance, read intensive workloads. The drive is placed in the SSD cage of a POWER8 Scale-out server and configured as part of a 2-tier RAID array using the Easy Tier function of the expanded function backplane. Limitations:

- The drive is only supported in an Easy Tier array
- Formatting to 4096 byte sectors is not supported
- Cannot mix 528 byte sector dirves and 4224 byte sector drives in the same array.
- Attributes provided: 4k byte fomatted, Read Intensive 1.8-inch SSD with 177GB capacity eMLC
- Attributes required: Availalbe 1.8-inch SSD bay in POWER8 system unit with Easy Tier functionality. A #EB2W carrier/tray is NOT required.
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
  - AIX 6.1 and 7.1 or later supported
  - IBM i - not supported
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0Z) - 177 GB 1.8" SSD Read Intensive for AIX/Linux (528 byte)

(No Longer Available as of October 27, 2017)

The 177 GB 1.8" SAS Solid State Drive (SSD) provides 528 byte sectors for high performance, read intensive workloads. The drive is placed in the SSD cage of a POWER8 Scale-out server and configured as part of a 2-tier RAID array using the Easy Tier function of the expanded function backplane. Limitations:

- The drive is only supported in an Easy Tier array
- Formatting to 512 byte sectors is not supported
- Cannot mix 528 byte sector dirves and 4224 byte sector drives in the same array.
- Attributes provided: 528 byte formatted, Read Intensive 1.8-inch SSD with 177GB capacity eMLC
- Attributes required: Availalbe 1.8-inch SSD bay in POWER8 system unit with Easy Tier functionality. A #EB2W carrier/tray is NOT required.
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
    - AIX 6.1 and 7.1 or later supported
    - IBM i - not supported
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERF1) RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs

(No longer available as of February 28, 2019)

The specify feature attaches one Radio Frequency Identification Device (RFID) tag to a Server CEC, rack, HMC, compute node, or chassis enclosure. This can be used with MTM (machine type model) rack such as a 7953-94X or 7014-T42, not a feature code rack such as a #0553. It applies to newly shipped MTM servers, racks, HMCs, compute nodes, and chassis enclosures, not MES orders with one exception. POWER5 CECs being upgraded to a POWER6 CEC or POWER6 CECs being upgraded to a POWER 7 CEC can order this feature. The RFID tag meets the Financial Services Technology Consortium (FSTC) specifications for IT Data Center Asset Tracking.

- Attributes provided: RFIDs
- Attributes required: Server CEC, Compute Node, Chassis, MTM Rack, or HMC
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ERG0) - Rear rack extension

Extends the rear of a 2.0M enterprise rack (#0553) eigth inches or 20.3 cm. The extra depth provides extra space for cable management helping to keep the center of the rack more open for airflow and access to the rear of the equipment mounted in the rack. This rear extension does not increase or decrease the rack's 42 EIA (42U) vertical size. The extension does increase the floor footprint.

- Attributes provided: Adds eigth inches or 20.3 cm to the rear of a 2.0M rack.
- Attributes required: 42U 2m enterprise rack such as #0553
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ES0C) - 387GB SFF-2 SSD for AIX/Linux with eMLC

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 528 byte sectors. The drive is supported in SFF-2 SAS bays in the #5887 I/O drawer. CCIN is 58B9..

ES0C and ES0D are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES0C indicates usage by AIX, Linux or VIOS. ES0D indicates usage by IBM i.

Limitation: Cannot be used in #5802/#5803 I/O drawers or in system unit SFF SAS bays due to physical difference in Gen1 and Gen2 carriers. Also drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported

- Attributes provided: 387GB SFF-2 SSD formatted with 528 byte formatting
- Attributes required: One SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 168 (Initial order maximum: 0)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES0G) - 775GB SFF-2 SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 528 byte sectors. The drive is supported in SFF-2 SAS bays in the #5887 I/O drawer. CCIN is TBD.

ES0G and ES0H are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES0G indicates usage by AIX, Linux or VIOS. ES0H indicates usage by IBM i.

Limitation: Cannot be used in #5802/#5803 I/O drawers or in system unit SFF-1 SAS bays due to physical difference in Gen1 and Gen2 carriers. Also drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported

- Attributes provided: 775GB SFF-2 SSD formatted with 528 byte sectors
- Attributes required: One SFF-2 SAS bay in EXP24S drawer
- Minimum required: 0
- Maximum allowed: 168 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0L) - 387GB SFF-3 SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 528 byte sectors. Enterprise Multi-Level Cell (eMLC) flash memory technology is used to provide extremely reliable, cost effective SSD storage. The drive is supported in SFF Gen3 SAS bays (SFF-3) in the POWER8 system unit. CCIN is 59E6.

ES0L and ES0M are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. #ES0L indicates usage by AIX, Linux or VIOS. #ES0M indicates usage by IBM i.

Limitation: Cannot be used in #5887 EXP24S Gen2 I/O drawer due to physical difference in the tray/carrier. 512 byte sectors and thus JBOD mode for AIX/Linux is not supported

- Attributes provided: 387 GB SSD in a SFF Gen3 carrier
- Attributes required: One SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0N) - 775GB SFF-3 SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 528 byte sectors. Enterprise Multi-Level Cell (eMLC) flash memory technology is used to provide extremely reliable, cost effective SSD storage. The drive is supported in SFF Gen3 SAS bays (SFF-3) in the POWER8 system unit. CCIN is 59EA.

#ES0N and #ES0P are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. #ES0N indicates usage by AIX, Linux or VIOS. #ES0P indicates usage by IBM i.

Limitation: Cannot be used in #5887 EXP24S Gen2 I/O drawer due to physical difference in the tray/carrier. 512 byte sectors and thus JBOD mode for AIX/Linux is not supported

- Attributes provided: 387 GB SSD in a SFF Gen3 carrier
- Attributes required: One SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES16) - 387GB 1.8" SSD for AIX/Linux

(No Longer Available as of October 11, 2016)

This Solid State Drive (SSD) is shipped from IBM with 528-byte sector RAID formatting to provide 387 GB capacity. It is placed in a 1.8" SAS bay. Enterprise Multi-Level Cell (eMLC) technology provides extremely reliable, cost effective, dense SSD storage. CCIN is 59BE.

Note that #ES16 and #ES17 are identical, but use different feature codes to help IBM configuration tools understand their usage.

Limitation: JBOD mode for AIX/Linux is not supported.

- Attributes provided: 1.8-inch eMLC SSD with 387GB capacity
- Attributes required: Available 1.8-inch SSD bay in POWER8 system unit. A #EB2W carrier/ tray is NOT required.
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES19) - 387GB SFF-2 SSD for AIX/Linux

(No Longer Available as of August 31, 2017)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 528 byte sectors. The drive is supported in SFF-2 SAS bays in the #5887 EXP24S I/O drawer. CCIN is 58B9.

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 528 byte sectors. The drive is supported in SFF SAS bays in the #5802/#5803/#EL36 I/O drawers or in system unit SFF-1 SAS bays. CCIN is 58B8.

#ES19 and #ES1A are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. #ES19 indicates usage by AIX, Linux or VIOS. #ES1A indicates usage by IBM i.

#ES19/ES1A and the earlier ES0C/ES0D are all 387GB SSD and can be mixed in the same array.

Limitation: Cannot be used in #5802/5803/EL36 I/O drawers or in a system unit SFF-1 SAS bay due to physical difference in Gen1 and Gen2 carriers. Also drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported

- Attributes provided: 387GB SFF-2 SSD formatted with 528 byte sectors
- Attributes required: One SFF-2 SAS bay in EXP24S drawer
- Minimum required: 0
- Maximum allowed: 168 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES1C) - 387GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This Solid State Drive (SSD) provides 387 GB capacity formatted in 528-byte sectors (5xx). It is placed in a 1.8-inch SAS bay of a POWER8 system unit such as the S822, S824 or E850.

Gen4 Enterprise Multi-Level Cell (eMLC4) technology is used to provide extremely reliable, cost effective, excellent perfromance storage. CCIN is 5B32 .

Note that #ES1C and #ES1D are identical, but use different feature codes to help IBM configuration tools understand their usage.

Limitations: Reformatting to 512-byte sectors (JBOD) is not supported. Reformatting to 4k byte sectors is not supported. 5xx and 4k drives cannot be mixed in the same array. Drive is not supported in the EXP30 drawer.

- Attributes provided: 1.8-inch SSD with 387 GB capacity
- Attributes required: 1.8-inch SAS bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
  - AIX Supported
  - Red Hat Enterprise Linux 6.7, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu 14.04.4, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository: http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES2V) - 387GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux

This Solid State Drive (SSD) provides 387 GB capacity formatted in 4224-byte sectors (4k). It is placed in a 1.8-inch SAS bay of a POWER8 system unit such as the S822, S824 or E850.

Gen4 Enterprise Multi-Level Cell (eMLC4) technology is used to provide extremely reliable, cost effective, excellent perfromance storage. CCIN is 5B30.

Note that #ES2V and #ES2W are identical, but use different feature codes to help IBM configuration tools understand their usage.

Limitations: Reformatting to 4096-byte sectors (JBOD) is not supported. Reformatting to 5xx byte sectors is not supported. 5xx and 4k drives cannot be mixed in the same array. Drive is not supported in the EXP30 drawer.

- Attributes provided: 1.8-inch SSD with 387 GB capacity
- Attributes required: 1.8-inch SAS bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
    - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, or later
    - AIX Version 7.1 with the 7100-04 Technology Level, or later
    - AIX Version 7.2 with the 7200-00 Technology Level, or later
    - Red Hat Enterprise Linux 6.7, or later
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Enterprise Linux 11, Service Pack 4, or later
    - SUSE Enterprise Linux 12, Service Pack 1, or later
    - Ubuntu 14.04.4, or later
    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
    http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES2X) - 775GB 1.8" SAS 5xx SSD eMLC4 for AIX/Linux

This Solid State Drive (SSD) provides 775 GB capacity formatted in 528-byte sectors (5xx). It is placed in a 1.8-inch SAS bay of a POWER8 system unit such as the S822, S824 or E850.

Gen4 Enterprise Multi-Level Cell (eMLC4) technology is used to provide extremely reliable, cost effective, excellent perfromance storage. CCIN is 5B33.

Note that #ES2X and #ES2Y are identical, but use different feature codes to help IBM configuration tools understand their usage.

Limitations: Reformatting to 512-byte sectors (JBOD) is not supported. Reformatting to 4k byte sectors is not supported. 5xx and 4k drives cannot be mixed in the same array. Drive is not supported in the EXP30 drawer.

- Attributes provided: 1.8-inch SSD with 775 GB capacity
- Attributes required: 1.8-inch SAS bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
    - AIX Supported
    - Red Hat Enterprise Linux 6.7, or later
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Enterprise Linux 11, Service Pack 4, or later
    - SUSE Enterprise Linux 12, Service Pack 1, or later
    - Ubuntu 14.04.4, or later
    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
    http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4K) - 775GB 1.8" SAS 4k SSD eMLC4 for AIX/Linux

This Solid State Drive (SSD) provides 775 GB capacity formatted in 4224-byte sectors (4k). It is placed in a 1.8-inch SAS bay of a POWER8 system unit such as the S822, S824 or E850.

Gen4 Enterprise Multi-Level Cell (eMLC4) technology is used to provide extremely reliable, cost effective, excellent perfromance storage. CCIN is 5B31.

Note that #ES4K and #ES4L are identical, but use different feature codes to help IBM configuration tools understand their usage.

Limitations: Reformatting to 4096-byte sectors (JBOD) is not supported. Reformatting to 5xx byte sectors is not supported. 5xx and 4k drives cannot be mixed in the same array. Drive is not supported in the EXP30 drawer.

- Attributes provided: 1.8-inch SSD with 775 GB capacity
- Attributes required: 1.8-inch SAS bay in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 6 (Initial order maximum: 6)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3, or later
  - AIX Version 7.1 with the 7100-04 Technology Level, or later
  - AIX Version 7.2 with the 7200-00 Technology Level, or later
  - Red Hat Enterprise Linux 6.7, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu 14.04.4, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES62) - 3.86-4.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)

3.86 TB 3.5-inch (Large Form Factor (LFF)) 7200 rpm SAS disk drive on Gen-1 carrier/tray. Supported in LFF-1 SAS bays such as found in EXP12SX Storage Enclosure. CCIN is 5B1D.

IBM Manufacturing ships the drive formatted with 4224 byte sectors for additional data integrity protection which results in 3.86 TB capacity. The drive can be reformatted to 4096 byte sectors by the client which which results in 4 TB capacity, but with less protection. NOTE: Reformatting large, 7200 rpm drives takes very significant time.

Limitation: Can not be in the same array as a 10k or 15k rpm drive

- Attributes provided: One enterprise nearline drive.
- Attributes required: One LFF (3.5-inch) bay in EXP12SX Storage Enclosure
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES64) - 7.72-8.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)

7.72 TB 3.5-inch (Large Form Factor (LFF)) 7200 rpm SAS disk drive on Gen-1 carrier/tray. Supported in LFF-1 SAS bays such as found in EXP12SX Storage Enclosure. CCIN is 5B1F.

IBM Manufacturing ships the drive formatted with 4224 byte sectors for additional data integrity protection which results in 7.72 TB capacity. The drive can be reformatted to 4096 byte sectors by the client which which results in 8 TB capacity, but with less protection. NOTE: Reformatting large, 7200 rpm drives takes very significant time.

Limitation: Can not be in the same array as a 10k or 15k rpm drive.

- Attributes provided: One enterprise nearline drive.
- Attributes required: One LFF (3.5-inch) bay in EXP12SX Storage Enclosure
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES78) - 387GB SFF-2 SSD 5xx eMLC4 for AIX/Linux

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays. CCIN is 5B16

ES78 and ES79 are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES78 indicates usage by AIX, Linux or VIOS. ES79 indicates usage by IBM i.

Limitation: Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in #5887 EXP24S or #ESLS EXP24SX drawers (SFF-2). It does not fit in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) or POWER8 system units (SFF-3) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array. 4k drives can not be reformatted to 5xx drives (or vice versa).

- Attributes provided: one 387GB SFF-2 5xx SSD.
- Attributes required: one SFF-2 SAS bay.
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
  - AIX supported
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES7E) - 775GB SFF-2 SSD 5xx eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays. CCIN is 5B17

ES7E and ES7F are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES7E indicates usage by AIX, Linux or VIOS. ES7F indicates usage by IBM i.

Limitation: Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in #5887 EXP24S or #ESLS EXP24SX drawers (SFF-2). It does not fit in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) or POWER8 system units (SFF-3) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array. 4k drives can not be reformatted to 5xx drives (or vice versa).

- Attributes provided: one 775GB SFF-2 5xx SSD.
- Attributes required: one SFF-2 SAS bay.
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
  - AIX supported
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES7K) - 387GB SFF-3 SSD 5xx eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. CCIN is 5B19

- ES7K and ES7L are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES7K indicates usage by AIX, Linux or VIOS. ES7L indicates usage by IBM i.
- Limitation: Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array. 4k drives cannot be reformatted to 5xx drives (or vice versa).
- Attributes provided: one 387GB SFF-3 5xx SSD
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES7P) - 775GB SFF-3 SSD 5xx eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. CCIN is 5B1A

- ES7P and ES7Q are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES7P indicates usage by AIX, Linux or VIOS. ES7Q indicates usage by IBM i.
- Limitation: Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array. 4k drives cannot be reformatted to 5xx drives (or vice versa).
- Attributes provided: one 775GB SFF-3 5xx SSD
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - AIX supported
  Linux OS levels (native or supported under PowerVM):

    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES80) - 1.9TB Read Intensive SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 23, 2018.)

1.9 TB SAS 2.5-inch (SFF) read intensive solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24S. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors. CCIN is 5B21. Actual capacity is 1.86 TB but is rounded up for convenience.

Drive is designed for read intensive workloads with light write activity. Approximately 3,394 TB of data can be written over the life of the drive, but depending on the nature of the workload may be somewhat larger. After the warranty period, if the maximum write capability is achieved, the drive's replacement is not covered under IBM maintenance.

#ES80 and #ES81 are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. #ES80 indicates usage by AIX, Linux or VIOS. #ES81 indicates usage by IBM i.

Limitations: The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 1.9 TB Read Intensive SSD
- Attributes required: Open SFF-2 SAS bay in an EXP24S controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2
    - AIX version 7.1 with the 7100-03 Technology Level and Service Pack 7 (planned availability September 8, 2016)
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Enterprise Linux 11, Service Pack 4, or later
    - SUSE Enterprise Linux 12, Service Pack 1, or later
    - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository: http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: AIX - Assignment to the VIOS requires VIOS 2.2.4.2 or later.

(#ES83) - 931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of January 18, 2019)

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

Drive Capacity	Total Bytes Written (TBW) in (TB)
931 GB	1700
1.86 TB	3399
3.72 TB	6799

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ES83 and #ES84 are physically identical drives with the same 5B28 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ES83 indicates usage by AIX, Linux or VIOS. #ES84 indicates usage by IBM i.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 931 GB Mainstream SSD

- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 12)

- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html

- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No

(#ES85) - 387GB SFF-2 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays.

CCIN is 5B10.

ES85 and ES86 are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES85 indicates usage by AIX, Linux or VIOS. ES86 indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in #5887/#EL1S EXP24S drawers (SFF-2)

- It does not fit in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) or POWER8 system units (SFF-3) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array.

- 4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387GB SFF-2 4k SSD

- Attributes required: one SFF-2 SAS bay

- Minimum required: 0

- Maximum allowed: 36 (Initial order maximum: 36)

- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
  - AIX Version 7.1 with the 7100-04 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level or later
  Linux OS levels (native or supported under PowerVM):
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

- Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8C) - 775GB SFF-2 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays.

CCIN is 5B11.

ES8C and ES8D are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES8C indicates usage by AIX, Linux or VIOS. ES8D indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in #5887/#EL1S EXP24S drawers (SFF-2). It does not fit in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) or POWER8 system units (SFF-3) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array.
  4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.
- Attributes provided: one 775GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 36 (Initial order maximum: 36)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
  - AIX Version 7.1 with the 7100-04 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level or later
  Linux OS levels (native or supported under PowerVM):
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8F) - 1.55TB SFF-2 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 1.55TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) I/O drawer.

CCIN is 5B12.

ES8G and ES8F are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES8F indicates usage by AIX, Linux or VIOS. ES8G indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in the EXP24S drawers (SFF-2 SAS bays). It cannot be used in POWER8 system units (SFF-3) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported.
- 4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: one 1.55TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
    - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
    - AIX Version 7.1 with the 7100-04 Technology Level or later
    - AIX Version 7.2 with the 7200-00 Technology Level or later
    Linux OS levels (native or supported under PowerVM):

    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - Ubuntu Server
    Bare Metal and PowerKVM environments not supported on server

    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8J) - 1.9TB Read Intensive SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of January 23, 2018.)

1.9 TB SAS 2.5-inch (SFF) read intensive solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray to fit in a POWER8 system unit. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors. CCIN is 5B20. Actual capacity is 1.86 TB but is rounded up for convenience.

Drive is designed for read intensive workloads with light write activity. Approximately 3,394 TB of data can be written over the life of the drive, but depending on the nature of the workload may be somewhat larger. After the warranty period, if the maximum write capability is achieved, the drive's replacement is not covered under IBM maintenance.

#ES8J and #ES8K are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. #ES8J indicates usage by AIX, Linux or VIOS. #ES8K indicates usage by IBM i.

Limitations: The drive is mounted on a SFF-3 carrier/tray and does not physically fit into an expansion unit such as the EXP24S's SFF-2 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array.

- Attributes provided: 1.9 TB Read Intensive SSD
- Attributes required: Open SFF-3 SAS bay in a POWER8 system unit and controlled by the internal SAS control unit.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2
    - AIX version 7.1 with the 7100-03 Technology Level and Service Pack 7 (planned availability September 8, 2016)
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Enterprise Linux 11, Service Pack 4, or later
    - SUSE Enterprise Linux 12, Service Pack 1, or later
    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
    http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Note: AIX - Assignment to the VIOS requires VIOS 2.2.4.2 or later.

(#ES8N) - 387GB SFF-3 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays.

CCIN is 5B13.

ES8N and ES8P are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES8N indicates usage by AIX, Linux or VIOS. ES8P indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3).
- It does not fit in EXP24S drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array.
- 4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of

this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
  - AIX Version 7.1 with the 7100-04 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level or later
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8Q) - 775GB SFF-3 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays.

CCIN is 5B14.

ES8Q and ES8R are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES8Q indicates usage by AIX, Linux or VIOS. ES8R indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3)
- It does not fit in EXP24S drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array.
- 4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
  - AIX Version 7.1 with the 7100-04 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level or later
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8V) - 1.55TB SFF-3 SSD 4k eMLC4 for AIX/Linux

(No longer available as of January 18, 2019)

This SFF (2.5") SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays.

CCIN is 5B15.

ES8V and ES8W are physically identical drives which have different feature codes to help the IBM configuration tools understand how the SSD is used. ES8V indicates usage by AIX, Linux or VIOS. ES8W indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3)
- It does not fit in EXP24S drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. Note 4k and 5xx byte sector drives cannot be mixed in the same array.
- 4k drives cannot be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55TB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 6.1 with the 6100-09 Technology Level Service Pack 3, or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 or later
  - AIX Version 7.1 with the 7100-04 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level or later
  Linux OS levels (native or supported under PowerVM):

  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Ubuntu Server
  Bare Metal and PowerKVM environments not supported on server

  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Attachment to the VIOS requires VIOS 2.2.3.3 or later, VIOS 2.2.4.0 or later

(#ES8Y) - 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 18, 2019)

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity      Total Bytes Written (TBW) in (TB)
931 GB              1700
1.86 TB             3399
3.72 TB             6799
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ES8Y and #ES8Z are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ES8Y indicates usage by AIX, Linux or VIOS. #ES8Z indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES90) - 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ES90 and #ES91 are physically identical drives with the same CCIN of 5B13. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ES90 indicates usage by AIX, Linux or VIOS. Feature ES91 indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ES92) - 1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of January 18, 2019)

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity      Total Bytes Written (TBW) in (TB)
931 GB              1700
1.86 TB             3399
3.72 TB             6799
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ES92 and #ES93 are physically identical drives with the same 5B20 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ES92 indicates usage by AIX, Linux or VIOS. #ES93 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - AIX Version 7.2 with the 7200-02 Technology Level or later
    - AIX Version 7.2 with the 7200-01 Technology Level or later
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
    - AIX Version 7.1 with the 7100-05 Technology Level or later
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.
- Red Hat Enterprise Linux 7.2, little endian, or later
- Red Hat Enterprise Linux 7.2, big endian, or later
- SUSE Enterprise Linux 11, Service Pack 4, or later
- SUSE Enterprise Linux 12, Service Pack 1, or later
- Ubuntu Server 16.04, or later

Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES94) - 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ES94 and #ES95 are physically identical drives with the same CCIN of 5B10. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ES94 indicates usage by AIX, Linux or VIOS. Feature ES95 indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.
- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ES96) - 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 18, 2019)

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity      Total Bytes Written (TBW) in (TB)
931 GB              1700
1.86 TB             3399
3.72 TB             6799
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

#ES96 and #ES97 are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ES96 indicates usage by AIX, Linux or VIOS. #ES97 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 1.86 TB Mainstream SSD

- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.

- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 250)

- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later

    - AIX Version 7.2 with the 7200-01 Technology Level or later

    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later

    - AIX Version 7.1 with the 7100-05 Technology Level or later

    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later

    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later

    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

    Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.
    - Red Hat Enterprise Linux 7.2, little endian, or later

    - Red Hat Enterprise Linux 7.2, big endian, or later

    - SUSE Enterprise Linux 11, Service Pack 4, or later

    - SUSE Enterprise Linux 12, Service Pack 1, or later

    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
    http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html

- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No

(#ESA3) - PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb CR

The PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6 Gb provides high performance HDD or SSD controller function using PCIe Gen2 technology. HDD and SSD can be either SFF or 3.5-inch drives (or both). A pair of #ESA3 adapters are required to provide mirrored write cache data and adapter redundancy. Integrated flash memory provides protection of the write cache without batteries in case of power failure.

The #ESA3 provides three Mini-SAS HD (high density) connectors for the attachment of SAS drives located in the #5887 EXP24S, #5886 EXP12S, or #5802 12X PCIe I/O drawers. X, YO or AT SAS cables with HD connectors are used to attach to these drawers. A max of 3 EXP24S or 6 EXP12S can be attached. If controlling drives in a #5802, at least one of #ESA3 pair must be located in that #5802. If not controlling drives in a #5802, the adapters can be placed in any PCIe slot which supports their use and the PCIe slots can be in different enclosures. An AA SAS cable with HD connectors is attached to the #ESA3 pair to communicate status and cache content information and is required unless all three ports are being used to attach I/O drawers.

The #ESA3 provides RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. The adapter provides RAID 5 and RAID 6 for IBM i. IBM i provides both OS mirroring and data spreading. AIX/Linux/VIOS provide OS mirroring (LVM). The CCIN = 57BB for this adapter.

#ESA3 is a refreshed version of the #5913 PCIe2 adapter offering the same function and performance, but with lower energy consumption.

Limitations:

- Cannot be paired with feature 5913

- Cannot be used with non-paired feature 5924

- 4k byte sector HDD/SSD are not supported. Only 5xx byte sector drives are supported on this generation of PCIe adapter

- Attributes provided: PCIe2 1.8 GB Cache RAID SAS Adapter

- Attributes required: One PCIe slot per adapter and Mini-SAS HD connector SAS cables

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 0)

- OS level required:
  - Linux supported

    - AIX supported

    - Refer to Software Requirements for specific O/S levels supported

    - IBM i 7.1 TR11 or later supported via VIOS

    - IBM i 7.2 TR3 or later supported via VIOS
- Initial Order/MES/Both/Supported: Supported

- CSU: Yes

- Return parts MES: No
  Note: VIOS supported

(#ESB0) - 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESB0 CCIN is 5B19. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESB0 indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device

interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
    - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESB2) - 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESB2 CCIN is 5B16. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESB2 indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
    - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESB4) - 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Feature #ESB4 CCIN is 5B1A. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESB4 indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
    - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESB6) - 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESGZ CCIN is 5B17. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESGZ indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
    - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESB8) - 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESB8 and #ESB9 are physically identical drives with the same CCIN of 5B13. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESB8 indicates usage by AIX, Linux or VIOS. Feature ESB9 indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24SX drawers (SFF-2) or in #5802/ #5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
    - AIX supported
    - Linux Supported
    - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESBA) - 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESBA and #ESBB are physically identical drives with the same CCIN of 5B10. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESBA indicates usage by AIX, Linux or VIOS. Feature ESBB indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device

interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
  - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESBE) - 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESBE and #ESBF are physically identical drives with the same CCIN of 5B14. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESBE indicates usage by AIX, Linux or VIOS. Feature ESBF indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24SX drawers (SFF-2) or in #5802/ #5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
  - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESBG) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESBG and #ESBH are physically identical drives with the same CCIN of 5B11. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESBG indicates usage by AIX, Linux or VIOS. Feature ESBH indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
  - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESBJ) - 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESBJ and #ESBK are physically identical drives with the same CCIN of 5B15. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESBJ indicates usage by AIX, Linux or VIOS. Feature ESBK indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24SX drawers (SFF-2) or in #5802/ #5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
  - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESBL) - 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

IBM solid state device failures will be replaced during the standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense.

Features #ESBL and #ESBM are physically identical drives with the same CCIN of 5B12. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESBL indicates usage by AIX, Linux or VIOS. Feature ESBM indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
  - IBM i requires VIOS
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESC0) - S&H - No Charge

No charge shipping and handling

- Attributes provided: None
- Attributes required: Sales Preapproval Required
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: Does not apply
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- Return parts MES: Does not apply

(#ESC5) - S&H-a

(No longer available as of February 28, 2019)

Shipping and handling

- Attributes provided: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#ESCB) - SAN-less PowerVM Compute Node Indicator

(No longer available as of February 28, 2019)

This feature indicates a solution for SAN-less PowerVM Compute Node (SDI Starter Cloud).

- Attributes provided: Indicator Feature
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#ESD3) - 1.2TB 10K RPM SAS SFF-2 Disk Drive (AIX/Linux)

(No longer available as of April 24, 2020)

1.20TB SFF 10K RPM SAS disk drive in Gen2 carrier. Supported in SFF-2 SAS bay such as used in the #5887 EXP24S I/O drawer. Disk is formatted for 512 byte sectors as shipped from IBM Manufacturing. CCIN is 59CD.

The drive can be reformatted to 528 byte sectors and used by AIX/ IBM i/Linux/VIOS.

Limitations: physical difference in Gen1 and Gen2 carriers prevent usage in SFF-1 bays such as used in the #5802/5803 I/O drawer

- Attributes provided: 1.20TB 10K RPM 2.5-inch SAS disk drive mounted on Gen-2 carrier (SFF-2)
- Attributes required: one SFF-2 SAS bay in EXP24S drawer
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESD5) - 600GB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)

600 GB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 512 byte sectors. If reformatted to 528 byte sectors, capacity would be 571 GB.

CCIN is 59D0.

Limitation: Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.

Limitation: Cannot be combined in the same array as a drive of the same capacity, but using different sector size

- Attributes provided: 600 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux
    - SUSE Linux Enterprise Server
    - AIX 6.1 and 7.1 or later supported
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESD9) - 1.2TB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)

(No longer available as of December 31, 2020)

1.2 TB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 512 byte sectors. If reformatted to 528 byte sectors, capacity would be 1.14 TB.

CCIN is 59D8

Limitation: Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.

Limitation: Cannot be combined in the same array as a drive of the same capacity, but using different sector size

- Attributes provided: 1.2 TB disk drive - SFF-3
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDB) - 300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 512 byte sectors. If reformatted to 528 byte sectors, capacity would be 283 GB.

CCIN is 59E0

Limitation: Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.

Limitation: Cannot be combined in the same array as a drive of the same capacity, but using different sector size.

- Attributes provided: 300 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDF) - 600GB 15k RPM SAS SFF-3 Disk Drive - 5xx Block

(No longer available as of December 31, 2020)

2.5-inch (Small Form Factor (SFF)) 15k RPM SAS disk drive mounted in a Gen-3 carrier and supported in SAS SFF-3 bays. With 512 byte sectors (JBOD) drive capacity is 600GB. With 528 byte sectors (RAID) drive capacity is 571GB and the drive has additional data integrity protection. #ESDE and #ESDF are physically identical drives with the same CCIN. However, IBM Manufacturing always formats the #ESDE with 528 byte sectors. Depending on how the drive is ordered, IBM Manufacturing will ship #ESDF with either 512 or 528 byte formatting. Reformatting a disk drive can take significant time, especially on larger capacity disk drives.

- Attributes provided: One 600GB (571GB with 528 byte sectors) SFF SAS disk drive in Gen-3 carrier/ tray (SFF-3)
- Attributes required: Available Gen-3 drive bay (SFF-3) in POWER8 system unit
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDP) - 600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block

(No longer available as of December 31, 2020)

2.5-inch (Small Form Factor (SFF)) 15k RPM SAS disk drive mounted in a Gen-2 carrier and supported in SAS SFF-2 bays. With 512 byte sectors (JBOD) drive capacity is 600GB. With 528 byte sectors (RAID) drive capacity is 571GB and the drive has additional data integrity protection. #ESDN and #ESDP are physically identical drives with the same CCIN. However, IBM Manufacturing always formats the #ESDN with 528 byte sectors. Depending on how the drive is ordered, IBM Manufacturing will ship #ESDP with either 512 or 528 byte formatting. Reformatting a disk drive can take significant time, especially on larger capacity disk drives.

- Attributes provided: One 600GB (571GB with 528 byte sectors) SFF SAS disk drive in Gen-2 carrier/ tray (SFF-2)
- Attributes required: Available Gen-2 drive bay (SFF-2) in EXP24S drawer (such as #5887)
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDR) - 300GB 10k RPM SAS SFF-3 Disk Drive (AIX/Linux)

(No Longer Available as of July 8, 2016)

300 GB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 512 byte sectors. If reformatted to 528 byte sectors, capacity would be 283 GB.

CCIN is ????

Limitation: Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.

Limitation: Cannot be combined in the same array as a drive of the same capacity, but using different sector size

- Attributes provided: 300 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDT) - 146GB 15k RPM SAS SFF-3 Disk Drive (AIX/Linux)

(No Longer Available as of July 8, 2016)

146 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 512 byte sectors. If reformatted to 528 byte sectors, capacity would be 139 GB.

CCIN is ????

Limitation: Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.

- Attributes provided: 146 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESE1) - 3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of January 18, 2019)

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity      Total Bytes Written (TBW) in (TB)
931 GB                   1700
1.86 TB                  3399
3.72 TB                  6799
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESE1 and #ESE2 are physically identical drives with the same 5B2C CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESE1 indicates usage by AIX, Linux or VIOS. #ESE2 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository:
  http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESE7) - 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 18, 2019)

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity      Total Bytes Written (TBW) in (TB)
931 GB              1700
1.86 TB             3399
3.72 TB             6799
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

#ESE7 and #ESE8 are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESE7 indicates usage by AIX, Linux or VIOS. #ESE8 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitations:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.

- Red Hat Enterprise Linux 7.2, little endian, or later
- Red Hat Enterprise Linux 7.2, big endian, or later
- SUSE Enterprise Linux 11, Service Pack 4, or later
- SUSE Enterprise Linux 12, Service Pack 1, or later
- Ubuntu Server 16.04, or later

Note: Please install the latest iprutils software available in the IBM Power Tool Repository: http://www14.software.ibm.com/support/customercare/sa s/f/lopdiags/home.html

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESEV) - 600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096

600 GB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays such as found in EXP24S storage drawer. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 600 GB or with 4224 byte sectors the capacity is 571 GB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size.
- Physically does not fit in a SFF-1 or SFF-3 bay due to carrier/tray differences.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 571GB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESEZ) - 300GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive

(No longer available as of December 31, 2020)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays of EXP24S drawer. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB.

CCIN is 59C9.

Limitations:

- Cannot be used in POWER8 System unit SFF Gen3-bay Drawer because of physical difference of carrier/tray.
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 300 GB Disk Drive - SFF-2 4K block
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESF3) - 1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096

1.2 TB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays such as found in EXP24S storage drawer. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 1.2 TB or with 4224 byte sectors the capacity is 1.14TB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size.
- Physically does not fit in a SFF-1 or SFF-3 bay due to carrier/tray differences.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 1.2TB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 or later

(#ESF5) - 600GB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096

600 GB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays such as found in POWER8 servers. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 600 GB or with 4224 byte sectors the capacity is 571 GB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size
- Physically does not fit in a SFF-1 or SFF-2 bay due to carrier/tray differences

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 600GB 10K RPM SFF-3 Disk 4K
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux 6.5, or later
  - Red Hat Enterprise Linux 7, big endian, or later
  - Red Hat Enterprise Linux 7.1, little endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 3, or later
  - SUSE Linux Enterprise Server 12, or later
  - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.3.3 or later

(#ESF9) - 1.2TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096

1.2 TB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays such as found in EXP24S storage drawer. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 1.2 TB or with 4224 byte sectors the capacity is 1.14TB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size
- Physically does not fit in a SFF-1 or SFF-2 bay due to carrier/tray differences

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: 1.2TB 10K RPM SFF-3 Disk 4K
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux 6.5, or later
    - Red Hat Enterprise Linux 7, big endian, or later
    - Red Hat Enterprise Linux 7.1, little endian, or later
    - SUSE Linux Enterprise Server 11, Service Pack 3, or later
    - SUSE Linux Enterprise Server 12, or later
    - Ubuntu 15.04, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Note: VIOS 2.2.3.3 or later

(#ESFB) - 300GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive

(No longer available as of December 31, 2020)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB.

CCIN is 59E1.

Limitations:

- Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray.
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 300 GB Disk Drive - SFF-3 4K block
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - Red Hat Enterprise Linux 6
    - SUSE Linux Enterprise Server
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 - or-AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 or later
    - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
    Requires VIOS 2.2.3.3 or later when assigned to the VIOS.

(#ESFF) - 600GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive

(No longer available as of December 31, 2020)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB.

CCIN is 59E5.

Limitations:

- Cannot be used in EXP24S SFF Gen2-bay Drawer because of physical difference of carrier/tray
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: 600 GB Disk Drive - SFF-3 4K block
- Attributes required: one SFF-3 SAS bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 - or-AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 or later
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Requires VIOS 2.2.3.3 or later when assigned to the VIOS.

(#ESFP) - 600GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive

(No longer available as of December 31, 2020)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays of EXP24S drawer. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB.

CCIN is 59CC.

Limitations:

- Cannot be used in POWER8 System unit SFF Gen3-bay Drawer because of physical difference of carrier/tray.
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 600 GB Disk Drive - SFF-2 4K block
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 72 (Initial order maximum: 72)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 3 - or-AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 or later
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Requires VIOS 2.2.3.3 or later when assigned to the VIOS.

(#ESFT) - 1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096

1.8 TB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays such as found in EXP24S storage drawer. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 1.8 TB or with 4224 byte sectors the capacity is 1.71TB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size.
- Physically does not fit in a SFF-1 or SFF-3 bay due to carrier/tray differences.

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: 1.8TB 10K RPM SFF-2 Disk 4K

- Attributes required: one SFF-2 SAS bay

- Minimum required: 0

- Maximum allowed: 72 (Initial order maximum: 72)

- OS level required:
  - Red Hat Enterprise Linux 6.5, or later

  - Red Hat Enterprise Linux 7, big endian, or later

  - Red Hat Enterprise Linux 7.1, little endian, or later

  - SUSE Linux Enterprise Server 11, Service Pack 3, or later

  - SUSE Linux Enterprise Server 12, or later

  - Ubuntu 15.04, or later

  - AIX Version 6.1 with the 6100-09 Technology Level + SP 3 and APAR IV56366 or later

  - AIX Version 7.1 with the 7100-03 Technology Level + SP 3 and APAR IV56367 or later

- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No
  Note: VIOS 2.2.3.3 or later

(#ESFV) - 1.8TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096

1.8 TB 2.5-inch (Small Form Factor (SFF)) 10k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays such as found in POWER8 system. IBM Manufacturing may ship formatted with 4224 byte sectors or with 4096 sectors. With 4096 byte sectors the drive's capacity is 1.8 TB or with 4224 byte sectors the capacity is 1.71TB. Using 4224 byte sectors provides additional data integrity protection. Reformatting large drives takes significant time.

Limitations:

- Cannot be combined in the same array as a drive using different sector size

- Physically does not fit in a SFF-1 or SFF-2 bay due to carrier/tray differences

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: 1.8TB 10K RPM SFF-3 Disk 4K

- Attributes required: one SFF-3 SAS bay

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 12)

- OS level required:
  - Red Hat Enterprise Linux 6.5, or later

  - Red Hat Enterprise Linux 7, big endian, or later

  - Red Hat Enterprise Linux 7.1, little endian, or later

  - SUSE Linux Enterprise Server 11, Service Pack 3, or later

  - SUSE Linux Enterprise Server 12, or later

  - Ubuntu 15.04, or later

  - AIX Version 6.1 with the 6100-09 Technology Level + SP 3 and APAR IV56366 or later

  - AIX Version 7.1 with the 7100-03 Technology Level + SP 3 and APAR IV56367 or later

- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No
  Note: VIOS 2.2.3.3 or later

(#ESG5) - 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESG5 and #ESG6 are physically identical drives with the same CCIN of 5B16. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESG5 indicates usage by AIX, Linux or VIOS. ESG6 indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESG9) - 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESG9 and #ESGA are physically identical drives with the same CCIN of 5B19. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESG9 indicates usage by AIX, Linux or VIOS. ESGA indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGB) - 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGB and #ESGC are physically identical drives with the same CCIN of 5B10. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGB indicates usage by AIX, Linux or VIOS. ESGC indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGD) - 387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGD and #ESGE are physically identical drives with the same CCIN of 5B13. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGD indicates usage by AIX, Linux or VIOS. ESGE indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGF) - 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGF and #ESGG are physically identical drives with the same CCIN of 5B17. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGF indicates usage by AIX, Linux or VIOS. ESGG indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGH) - 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGH and #ESGJ are physically identical drives with the same CCIN of 5B1A. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGH indicates usage by AIX, Linux or VIOS. ESGJ indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGK) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGK and #ESGL are physically identical drives with the same CCIN of 5B11. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGK indicates usage by AIX, Linux or VIOS. ESGL indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.
- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGM) - 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGM and #ESGN are physically identical drives with the same CCIN of 5B14. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGM indicates usage by AIX, Linux or VIOS. ESGN indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.
- Attributes provided: one 775 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGP) - 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGP and #ESGQ are physically identical drives with the same CCIN of 5B12. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGP indicates usage by AIX, Linux or VIOS. ESGQ indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGR) - 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGR and #ESGS are physically identical drives with the same CCIN of 5B15. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGR indicates usage by AIX, Linux or VIOS. ESGS indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESGT) - 387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGT CCIN is 5B19. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGT indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESGV) - 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 387 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGV CCIN is 5B16. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESGV indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESGX) - 775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGX CCIN is 5B1A. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESGX indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESGZ) - 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 5xx (528) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESGZ CCIN is 5B17. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESGZ indicates usage by AIX, Linux or VIOS.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 512 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESHJ) - 931 GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESHJ and #ESHK are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHJ indicates usage by AIX, Linux or VIOS. #ESHK indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70, or later.

(#ESHL) - 1.86 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESHL and #ESHM are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHL indicates usage by AIX, Linux or VIOS. #ESHM indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 1.86 TB Mainstream SSD

- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later

- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 250)

- OS level required:
    - AIX Version 7.2 with the 7200-02 Technology Level or later

    - AIX Version 7.2 with the 7200-01 Technology Level or later

    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later

    - AIX Version 7.1 with the 7100-05 Technology Level or later

    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later

    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later

    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

    Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
    - Red Hat Enterprise Linux 7.2, little endian, or later

    - Red Hat Enterprise Linux 7.2, big endian, or later

    - SUSE Enterprise Linux 11, Service Pack 4, or later

    - SUSE Enterprise Linux 12, Service Pack 1, or later

    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No

(#ESHS) - 931 GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESHS and #ESHT are physically identical drives with the same 5B2B CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHS indicates usage by AIX, Linux or VIOS. #ESHT indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - Linux supported
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESHU) - 1.86 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESHU and #ESHV are physically identical drives with the same 5B20 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHU indicates usage by AIX, Linux or VIOS. #ESHV indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJ0) - 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJ0 and #ESJ1 are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJ0 indicates usage by AIX, Linux or VIOS. #ESJ1 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 931 GB Mainstream SSD

- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.

- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 0)

- OS level required:
    - Linux supported

    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESJ2) - 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJ2 and #ESJ3 are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJ2 indicates usage by AIX, Linux or VIOS. #ESJ3 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 1.86 TB Mainstream SSD

- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later

- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 0)

- OS level required:
    - Linux supported

    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESJ4) - 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJ4 and #ESJ5 are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJ4 indicates usage by AIX, Linux or VIOS. #ESJ5 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 3.72 TB Mainstream SSD

- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later

- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 0)

- OS level required:
    - Linux supported
    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESJ8) - 931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

931 GB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJ8 and #ESJ9 are physically identical drives with the same 5B2B CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJ8 indicates usage by AIX, Linux or VIOS. #ESJ9 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 931 GB Mainstream SSD

- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 0)

- OS level required:
    - Linux supported
    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESJA) - 1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

1.86 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
```

7.45 TB 13601

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJA and #ESJB are physically identical drives with the same 5B20 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJA indicates usage by AIX, Linux or VIOS. #ESJB indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 1.86 TB Mainstream SSD

- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 0)

- OS level required:
    - Linux supported

    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESJC) - 3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESJC and #ESJD are physically identical drives with the same 5B2C CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJC indicates usage by AIX, Linux or VIOS. #ESJD indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.

- Attributes provided: 3.72 TB Mainstream SSD

- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later

- Minimum required: 0

- Maximum allowed: 12 (Initial order maximum: 0)

- OS level required:
    - Linux supported

    - AIX supported

- Initial Order/MES/Both/Supported: MES

- CSU: Yes

- Return parts MES: No

(#ESLA) - Specify AC Power Supply for EXP12SX/EXP24SX Storage Enclosure

No-charge specify for AC power supply for an EXP12SX or EXP24SX SAS Storage Enclosure.

The power supply has a 320-C14 inlet electrical connection for a separately ordered power cord. It is rated 800 Watts Output Power and 100 -- 240 VAC (RMS) input voltage.

- Attributes provided: communicates to IBM Manufacturing an AC Power Supply is to be used

- Attributes required: EXP12SX or EXP24SX Storage Enclosure and AC power cord

- Minimum required: 0

- Maximum allowed: 6 (Initial order maximum: 6)

- OS level required: N/A

- Initial Order/MES/Both/Supported: Both

- CSU: Yes

- Return parts MES: No

(#ESLL) - EXP12SX SAS Storage Enclosure

The EXP12SX is a storage expansion enclosure with twelve 3.5-inch large form factor (LFF) SAS bays. It supports up to 12 hot-swap Hard Disk Drives (HDD) in only 2 EIA of space in a 19-inch rack. The EXP12SX SFF bays use LFF gen1 (LFF-1) carriers/trays. 4k byte sector drives (4096 or 4224) are supported.

With AIX/Linux/VIOS, the EXP12SX can be ordered with four sets of 3 bays (mode 4), two sets of 6 bays (mode 2) or one set of 12 bays (mode 1). The mode setting can be changed in the field using software commands along with a specifically documented procedure. IMPORTANT NOTE: when changing mode, it is very important that you follow the documented procedures and that there is no data on the drives before the change. Improperly changing modes can potentially destroy existing RAID sets, prevent access to existing data, or allow other partitions to access another partition's existing data. Hire an expert to assist if you are not familiar with this type of re-configuration work.

The EXP12SX has redundant SAS paths to all drives via two redundant Enclosure Services Modules (ESMs). Four mini-SAS HD narrow ports are attached to PCIe Gen3 SAS adapters such as the #EJ0J/EJ0M or #EJ0L or #EJ14, or attached to an imbedded SAS controller in a POWER8 Scale-out server such as the Power S814, S822 or S824. Attachment between the SAS controller and the storage enclosure SAS ports is via the appropriate SAS YO12 or X12 cables. The PCIe Gen3 SAS adapters support 6Gb throughput. The EXP12SX has been designed to support up to 12Gb throughput if future SAS adapters support that capability.

The EXP12SX uses redundant power supplies and two power cords. Order two feature #ESLA for AC power supplies. The enclosure is shipped with adjustable depth rails and can accommodate rack depths from 59.5 - 75 cm (23.4 - 29.5 inches). Slot filler panels are provided for empty bays when initially shipped from IBM.

See also the 24-bay Small Form Factor (SFF) EXP24SX SAS Storage Enclosure (feature #ESLS) for higher performance drives with lower capacity.

Limitations: Not supported by IBM i. Does not support SSDs.

- Attributes provided: 12 LFF-1 SAS bays in a 2U enclosure
- Attributes required: PCIe Gen3 SAS adapter/controller; Power System (at least POWER8 generation); 2U 19-inch rack space; Appropriate SAS cables
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
    - AIX Version 7.2 with the 7200-01 Technology Level or later
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 3 and APAR IV88680 or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 8 and APAR IV88679 or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 8 or later (planned availability 1/27/2017)
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 3 or later (planned availability 1/27/2017)
    - Red Hat Enterprise Linux 8 for Power, or later
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Linux Enterprise Server 11, Service Pack 4, or later
    - SUSE Linux Enterprise Server 12, Service Pack 1, or later
    - Ubuntu Server 16.04.1, or later

    Note: Please install the latest iprutils package from the IBM Power Tools Repository for full support.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.5.10, or later

(#ESLS) - EXP24SX SAS Storage Enclosure

The EXP24SX is a storage expansion enclosure with 24 2.5-inch small form factor (SFF) SAS bays. It supports up to 24 hot-swap Hard Disk Drives (HDD) or Solid State Drives (SSD) in only 2 EIA of space in a 19-inch rack. The EXP24SX SFF bays use SFF gen2 (SFF-2) carriers/ trays identical to the carrier/trays in the previous EXP24S Drawer .

With AIX/Linux/VIOS, the EXP24SX can be ordered with four sets of 6 bays (mode 4), two sets of 12 bays (mode 2) or one set of 24 bays (mode 1). With IBM i one set of 24 bays (mode 1) is supported. The mode setting can be changed in the field using software commands along with a specificly documented procedure. IMPORTANT NOTE: when changing mode, it is very important that you follow the documented procedures and that there is no data on the drives before the change. Improperly changing modes can potentially destroy existing RAID sets, prevent access to existing data, or allow other partitions to access another partition's existing data. Hire an expert to assist if you are not familiar with this type of re-configuration work.

The EXP24SX has redundant SAS paths to all drives via two redundant Enclosure Services Modules (ESMs). Four mini-SAS HD narrow ports are attached to PCIe Gen3 SAS adapters such as the #EJ0J/EJ0M or #EJ0L or #EJ14, or attached to an imbedded SAS controller in a POWER8 Scale-out server such as the Power S814, S822 or S824. Attachment between the SAS controller and the storage enclosure SAS ports is via the appropriate SAS YO12 or X12 cables. The PCIe Gen3 SAS adapters support 6Gb throughput. The EXP24SX has been designed to support up to 12Gb throughput if future SAS adapters support that capability.

The EXP24SX uses redundant power supplies and two power cords. Order two feature #ESLA for AC power supplies. The enclosure is shipped with adjustable depth rails and can accommodate rack depths from 59.5 - 75 cm (23.4 - 29.5 inches). Slot filler panels are provided for empty bays when initially shipped from IBM.

See also the 12-bay Large Form Factor (LFF) EXP12SX SAS Storage Enclosure (feature #ESLL) for higher capacity drives with lower performance.

- Attributes provided: 24 SFF-2 SAS bays in a 2U enclosure
- Attributes required: PCIe Gen3 SAS adapter/controller; Power System (at least POWER8 generation); 2U 19-inch rack space; Appropriate SAS cables
- Minimum required: 0
- Maximum allowed: 3 (Initial order maximum: 3)
- OS level required:
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 3 and APAR IV88680 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 8 and APAR IV88679 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 8 or later (planned availability 1/27/2017)
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 3 or later (planned availability 1/27/2017)
  - IBM i only supported with VIOS
  - Red Hat Enterprise Linux 8 for Power, or later
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Linux Enterprise Server 11, Service Pack 4, or later
  - SUSE Linux Enterprise Server 12, Service Pack 1, or later
  - Ubuntu Server 16.04.1, or later

  Note: Please install the latest iprutils package from the IBM Power Tools Repository for full support.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 2.2.5.10, or later.

(#ESM8) - 3.72 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-2 carrier/tray to fit an expansion drawer such as the EXP24SX. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESM8 and #ESM9 are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESM8 indicates usage by AIX, Linux or VIOS. #ESM9 indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives can not be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
  - AIX Version 7.2 with the 7200-02 Technology Level or later
  - AIX Version 7.2 with the 7200-01 Technology Level or later
  - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-05 Technology Level or later
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
  - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
  - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

  Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
  - Red Hat Enterprise Linux 7.2, little endian, or later
  - Red Hat Enterprise Linux 7.2, big endian, or later
  - SUSE Enterprise Linux 11, Service Pack 4, or later
  - SUSE Enterprise Linux 12, Service Pack 1, or later
  - Ubuntu Server 16.04, or later

  Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESMQ) - 3.72 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

3.72 TB SAS 2.5-inch (SFF) Mainstream solid state drive (SSD) formatted in 4224 byte sectors (4k). The drive is mounted on a 2.5-inch SFF-3 carrier/tray. Drive is rated at 6Gb/s though actual performance is dependent upon multiple factors.

DWPD (Drive Write Per Day) rating is 1 calculated over a 5 year period. See the following table for the approximate lifetime Total Bytes Written (TBW) supported by each drive capacity:

```
Drive Capacity Total Bytes Written (TBW) in (TB)
931 GB 1700
1.86 TB 3399
3.72 TB 6799
7.45 TB 13601
```

Depending on the nature of the workload, the lifetime TBW may be somewhat larger. To read the warranty and maintenance applicable to mainstream devices on POWER8 and POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

Features #ESMQ and #ESMR are physically identical drives with the same 5B2C CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESMQ indicates usage by AIX, Linux or VIOS. #ESMR indicates usage by IBM i.
Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

Limitation:

- The drive is mounted on a SFF-3 carrier/tray to fit into a POWER8/POWER9 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive cannot be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
    - AIX Version 7.2 with the 7200-02 Technology Level or later
    - AIX Version 7.2 with the 7200-01 Technology Level or later
    - AIX Version 7.2 with the 7200-00 Technology Level and Service Pack 2 or later
    - AIX Version 7.1 with the 7100-05 Technology Level or later
    - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 2 or later
    - AIX Version 7.1 with the 7100-03 Technology Level and Service Pack 7 or later
    - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 7 or later (AIX 6.1 service extension required)

    Note: Assignment to the VIOS requires VIOS 2.2.6, or later; VIOS 2.2.5, or later; VIOS 2.2.4.20, or later; VIOS 2.2.3.70 or later.
    - Red Hat Enterprise Linux 7.2, little endian, or later
    - Red Hat Enterprise Linux 7.2, big endian, or later
    - SUSE Enterprise Linux 11, Service Pack 4, or later
    - SUSE Enterprise Linux 12, Service Pack 1, or later
    - Ubuntu Server 16.04, or later

    Note: Please install the latest iprutils software available in the IBM Power Tool Repository
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNA) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESNA and #ESNB are physically identical drives with the same CCIN of 5B11. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESNA indicates usage by AIX, Linux or VIOS. Feature ESNB indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure

compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESNC) - 775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESNC and #ESND are physically identical drives with the same CCIN of 5B14. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESNC indicates usage by AIX, Linux or VIOS. Feature ESND indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESNE) - 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESNE and #ESNF are physically identical drives with the same CCIN of 5B12. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESNE indicates usage by AIX, Linux or VIOS. Feature ESNF indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in SFF-2 bays such as found in EXP24SX storage enclosure and cannot be used in POWER8/POWER9 system units (SFF-3) or in older SFF-1 SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESNG) - 1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of December 31, 2020)

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 1.55 TB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-3 SAS bays. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

Features #ESNG and #ESNH are physically identical drives with the same CCIN of 5B15. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESNG indicates usage by AIX, Linux or VIOS. Feature ESNH indicates usage by IBM i.

Limitations:

- Due to physical differences in the carrier/tray on which the drive is mounted, the SSD only fits in POWER8/POWER9 system unit SAS bays (SFF-3). It does not fit in EXP24S or EXP24SX drawers (SFF-2) or in #5802/#5803 I/O drawers (SFF-1) or in POWER7 system units (SFF-1) SAS bays. Also the drive was not tested with 4096 byte sectors and thus JBOD mode for AIX/Linux is not supported. 4k drives can not be reformatted to 5xx drives (or vice versa).

Note: As part of a larger industry transition, IBM Power Systems is in the process of gradually shifting away from offering 5xx (512/ 528) byte sector SAS drives (HDD or SSD) to 4K byte sector drives. Most AIX/Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an AIX/Linux application may access the disk drive directly through the raw device interface and may still require only 5xx byte sectors drives. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESNK) - 300GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/Linux)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B41.

Limitations:

- Cannot be used in EXP24S or EXP24SX SFF Gen2-bay Drawer because of physical difference of carrier/tray.
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- Attributes provided: 300 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNM) - 300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B43.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 300 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
  - AIX Supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNP) - 600GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/Linux)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-3 carrier/tray. Supported in SFF-3 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B45.

Limitations:

- Cannot be used in EXP24S or EXP24SX SFF Gen2-bay Drawer because of physical difference of carrier/tray.
- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- Attributes provided: 600 GB Disk Drive - SFF-3
- Attributes required: one SFF-3 drive bay
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required:
  - AIX Supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNR) - 600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B47.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 600 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
  - AIX Supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESPM) - Quantity 150 of #ESNM (300GB 15k SFF-2)

This feature ships a quantity of 150 #ESNM 300GB 15K RPM 4K SAS SFF-2, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

Limitation: This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).

- Attributes provided: See feature#ESNM
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: see feature ESNM
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESPR) - Quantity 150 of #ESNR (600GB 15k SFF-2)

This feature ships a quantity of 150 #ESNR 600GB 15K RPM 4K SAS SFF-2, units. The configurator may either generate this feature or allow users to select this feature as they would any other single disk unit feature. This feature remains on the inventory records.

Limitation: This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).

- Attributes provided: See feature#ESNR
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESQ2) - Quantity 150 of ESB2 387GB SAS 4k

This feature ships a quantity of 150 #ESB2 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESB2
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature ESB2
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESQ6) - Quantity 150 of ESB6 775GB SAS 4k

This feature ships a quantity of 150 #ESB6 SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESB6
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature ESB6
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESQA) - Quantity 150 of ESBA 387GB SAS 4k

This feature ships a quantity of 150 #ESBA SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESBA
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature ESBA
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESQG) - Quantity 150 of ESBG 775GB SAS 4k

This feature ships a quantity of 150 #ESBG SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESBG
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature ESBG
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#ESQL) - Quantity 150 of ESBL 1.55TB SAS 4k

This feature ships a quantity of 150 #ESBL SSD. The configurator may either generate this feature or allow users to select this feature as they would any other single SSD feature. This feature remains on the inventory records.

- Attributes provided: see feature #ESBL
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 0)
- OS level required: See feature ESBL
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EU01) - 1TB Removable Disk Drive Cartridge

1TB Removable Disk Drive Cartridge (#EU01) provides a RDX disk drive in a rugged cartridge to be used in an RDX Internal and External Docking Station such as the (#1103, #1104 or #1123, #EU03, #EU04 ,#EU23, or #EU07 1TB is uncompressed. docking station. 1TB is uncompressed. Compression/decompression is provided by the operating system, not the drive itself. Feature EU01 is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 1TB RDX rugged disk cartridge
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: See Docking station for OS requirements
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EU04) RDX USB External Docking Station for Removable Disk Cartridge

(No longer available as of October 9, 2018)

USB Eternal Docking Station accommodates RDX removable disk cartridge of any capacity. The disk are in a protective rugged cartridge enclosure that plug into the docking station. The docking station holds one removable rugged disk drive/cartridge at a time. The rugged removable disk cartridge and docking station backs up similar to tape drive. This can be an excellent alternative to DAT72, DAT160, 8mm, and VXA-2 and VXA-320 tapes. CCIN: 632C-0D4

#EU04 is a follow on product to the #1104 RDX docking station. #EU04 has identical function and performance to the internal #EU03 RDX docking station.

- Attributes provided: USB RDX External Docking Station, 3M USB cable, 1M power cord with universal adapter 100-240 VAC, 50-60Hz input providing 15W DC to the docking station.
- Attributes required: One USB port and at least one #1106, #1107, #EU01, #EU08, #EU15, or follow-on Removable Disk Drive Cartridge
- Minimum required: 0
- Maximum allowed: 5 (Initial order maximum: 5)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX 6.1 and 7.1 or later supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported. Refer to Software Requirements for specific code levels supported.

(#EU08) - RDX 320 GB Removable Disk Drive

(No Longer Available as of November 30, 2015)

Provides a RDX disk drive in a rugged cartridge to be used in an RDX docking station such as #EU03, #EU04, #EU23, #1123, #1103, #1104 or #EU07. Capacity is 320 GB is uncompressed. Compression/ decompression is provided by the operating system, not the drive itself. Feature EU08 is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 320 GB RDX rugged disk/cartridge
- Attributes required: One docking station
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
  - See RDX Docking Station
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EU15) - 1.5TB Removable Disk Drive Cartridge

(No Longer Available as of November 30, 2015)

The 1.5 TB Removable Disk Drive Cartridge provides a RDX disk drive in a rugged cartridge to be used in an RDX Internal and External Docking Station such as (#1103, #1104 or #1123, #EU03, #EU04, #EU23, or #EU07. 1.5TB is uncompressed. Compression/ decompression is provided by the operating system, not the drive itself. Feature EU015 is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 1.5TB RDX rugged disk cartridge
- Attributes required: RDX docking station
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: See Docking station for OS requirements
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EU19) - Cable Ties & Labels

Set of 10 hook and loop fabric, often called VELCRO(R), ties 35.5 cm (14-inch) in length to conveniently attach cables or cords to rack or other cables. Set of 16 labels 2x4 inches (5x10 cm) in sizes to identify cables when installing or moving or servicing equipment.

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 254)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EU2B) - BLU Acceleration Solution Edition Indicator

(No Longer Available as of December 29, 2017)

This feature specifies that the Power ESE (8412-EAD) system order includes BLU Acceleration Solution Edition software components of the solution. This feature will automatically be selected by the configurator when the solution is configured. The solution will be integrated at the Customer Solution Center.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX 6.1 and 7.1 or later supported
  - IBM i - not supported
  - Red Hat Enterprise Linux 6.5, or later
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EU2T) - 2TB Removable Disk Drive Cartridge (RDX)

The 2.0TB Removable Disk Drive Cartridge provides a RDX disk drive in a rugged cartridge to be used in an RDX Internal and External Docking Station such as (#1103, #1104 or #1123, #EU03, #EU04, #EU23, or #EU07. 2.0TB is uncompressed. Compression/ decompression is provided by the operating system, not the drive itself. Feature EU2T is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 2.0TB RDX rugged disk cartridge
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: See docking station for OS requirements
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EUC0) - Solution Specify - Reserved

(No longer available as of April 24, 2018)

Communicates to the Customer Solution Center that no components of a given software product are to be preloaded.

- Attributes provided: Within a hardware and software solution, a define for software components.
- Attributes required: Hardware specify feature for the software product within a hardware and software solution.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EUC1) - Solution Specify - Reserved

(No longer available as of April 24, 2018)

Communicates to the Customer Solution Center that a given component of a software product is to be preloaded. The name of the software component is defined by the configurator.

- Attributes provided: Within a hardware and software solution, a define for a software component.
- Attributes required: Hardware specify feature for the software product within a hardware and software solution.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EUC2) - Solution Specify - Reserved

(No longer available as of April 24, 2018)

Communicates to the Customer Solution Center that a given component of a software product is to be preloaded. The name of the software component is defined by the configurator.

- Attributes provided: Within a hardware and software solution, a define for a software component.
- Attributes required: Hardware specify feature for the software product within a hardware and software solution.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EUC3) - Solution Specify - Reserved

(No longer available as of April 24, 2018)

Communicates to the Customer Solution Center that a given component of a software product is to be preloaded. The name of the software component is defined by the configurator.

- Attributes provided: Within a hardware and software solution, a define for a software component.
- Attributes required: Hardware specify feature for the software product within a hardware and software solution.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EUC6) - Core Use HW Feature

A Service Provider (SP) under a "revenue payment" contract with IBM pays IBM a percentage of revenue generated on their infrastructure used to deliver cloud services. The contract stipulates that each quarter the service provider calculates the amount due IBM and then purchases a quantity of features that satisfies the required payment. Each occurrence of this feature represents one billing unit.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 250 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EUC7) - Core Use HW Feature 10X

A Service Provider (SP) under a "revenue payment" contract with IBM pays IBM a percentage of revenue generated on their infrastructure used to deliver cloud services. The contract stipulates that each quarter the service provider calculates the amount due IBM and then purchases a quantity of features that satisfies the required payment. Each occurrence of this feature represents ten billing units.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 250 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

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Accessories

None

Customer replacement parts

The following parts have been designated as Tier 1 CRUs:

- DASD SFF Drive
- DASD SSD Drive
- DVD Drive
- Fan
- Fan Cage
- All PCI Adapters
- Base SAS Card
- High-Function RAID Card Cable
- Memory DIMMs
- Native USB Serial Card
- Operator Panel
- Operator Panel Cable
- Power Supply
- Line/power cord
- Keyboard
- Mouse
- External cables
- Power Bus Signal Cable
- Display
- Time of Day (TOD) Battery

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Supplies

None

Supplemental media

None

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