Family 9040+01 IBM Power System E950 (9040-MR9)

IBM Japan Sales Manual
Revised: November 17, 2020

Table of contents

- Product life cycle dates
- Abstract
- Highlights
- Description
- Models
- Technical description
- Publications
- Features
- Accessories
- Supplies

Product life cycle dates

Type Model	Announced	Available	Marketing Withdrawn	Service Discontinued
9040-MR9	2018-08-07	2018-08-17	-	-

Back to top

Abstract

IBM Power Systems for enterprise combines cloud management with leadership performance, scale, availability and security to cloud enable the most data intensive, mission critical workloads.

The Power System E950 server has built-in virtualization, flexible capacity, and high utilization, ideal for growing, medium-size businesses and as a departmental server or data center building block for large enterprises. Built with the new POWER9 architecture, the E950 provides improvements in application delivery and IT services through increased throughput, reduced response times, and increased memory and I/O bandwidths.

With its built-in virtualization and an ecosystem of open cloud solutions, you can cloud-enable any workload without migration and build a cloud that handles the most data-intensive workloads on earth on either a private, hybrid, or multi-cloud platform.

- Help reduce your operating costs and increase efficiency by consolidating your older, underutilized servers with the new compact, energy-efficient 4U form factor of the Power E950 server with its single backplane and single cooling domain.
- Help reduce maintenance and increase resource utilization and efficiency with up to 48 POWER9 cores and up to 16 TB DDR4 memory (4x more than IBM POWER8 E850C).
- Help enable more agile IT that rapidly adjusts to the demands of an ever-changing business environment. IBM PowerVM supports dynamic response to workload changes and seamlessly provisions processor or memory capacity permanently, or only as long as required, with capacity on demand for processors and memory.

This server generation has quadruple the memory footprint of POWER8 servers, making it an ideal platform for in-memory and data-centric applications. Changes in the memory subsystem and the use of industry standard memory DIMMs take POWER9 technology to the next level of balancing affordability and performance. Designed to run commercial, cognitive, and database workloads, POWER9 technology provides a highly competitive server platform. Client references indicate POWER servers help provide a robust and secure backbone for their IT infrastructure. More companies are using POWER technology in their IT infrastructure, from large data center down to shop level deployments.

By default, the Power Management mode of the Power E950 server is set to Max Performance. This mode can dynamically optimize the processor frequency at any given time based on CPU utilization and operating environmental conditions. For a description of this feature and other power management options available for this server, see the IBM EnergyScale for POWER9 Processor-Based Systems website.

The IBM Power System E950 server offers Elastic Capacity on Demand (Elastic CoD) for both cores and memory, Active Memory Expansion, and Active Memory Mirroring for Hypervisor. The E950 server supports AIX and Linux operating systems and IBM PowerVM Enterprise. The IBM Power System E950 server is a logical follow-on to the IBM Power Systems E850 and E850C servers.

Each IBM Power System E950 server includes the following additional software and services:

- Cloud Management Console (CMC) for IBM Power Systems - CMC is a cloud-native platform that provides apps that give powerful insights into your IBM Power Systems infrastructure across data centers and geographies. With no additional software or infrastructure setup, get single pane of glass views of your inventory, software levels, resource capacity utilization, as well as launch-in-context of your on-prem software such as PowerVC and PowerHA. Each new Power E950 server purchase includes 12 months of CMC service, which can be renewed. For more information, visit IBM Cloud Management Console website.
- Open source cloud automation and configuration tooling for AIX. IBM has expanded its commitment to keep key open source cloud management packages updated and to provide timely security fixes to enable clients to leverage open source skills. IBM Power System E950 server clients can take advantage of key packages recently provided to enable cloud automation. For more information, see the AIX Toolbox for Linux Applications website
  - chef automation for configuration, deployment, and management. IBM is collaborating with clients in this community to provide useful resources for using chef with AIX systems.
  - yum package management is available with repository access from both ftp and https protocols. rpm is also updated to enable automatic dependency discovery.
  - cloud-init and all dependencies are available in the repository and includes support for licensed AIX users. For more information, see the AIX Toolbox for Linux Applications website.
- Securely connect system-of-record workloads and data-to-cloud native applications. IBM's API Connect and IBM WebSphere Connect provide secure connectivity to cloud-based applications, giving clients the ability to rapidly develop new applications and services, thereby helping accelerate their time to value. IBM's Power to Cloud services can help clients get started with these solutions and in designing new applications that leverage IBM Cloud. Cloud enables clients to rapidly build, deploy, and manage their cloud applications, while tapping a growing ecosystem of available services and runtime frameworks.

Power to Cloud Services

To assist clients with their move to the cloud, IBM is bundling 5,000 points with every IBM Power Systems E950 server purchase that can be redeemed for on-site cloud deployment services. For additional details, see the IBM Power to Cloud Reward Program website. For those clients looking to create their own private cloud, expert services are available for cloud provisioning and automation with IBM Cloud PowerVC Manager with a heavy focus on creating and supporting a DevOps cloud implementation. For those clients looking for a hybrid cloud solution, Design for Hybrid Cloud Workshop services are available to help you produce best-of-breed applications using API Connect and IBM Cloud with IBM Power Systems. To learn more about all the new cloud capabilities that come with the IBM Power System E950 server, see the IBM Power Enterprise Cloud Index website.

- IBM Power System E950 hardware components: The IBM Power System E950 server delivers a high-performing and reliable 4-socket system in the marketplace, with simultaneous multithreading of up to eight threads per core (SMT8). Each IBM Power System E950 server's POWER9 single-chip module has two on-chip memory controllers and utilizes up to 128 MB off-chip eDRAM L4 cache to deliver 230 GB/sec of memory bandwidth per socket. I/O bandwidth is also increased to double that of the predecessor POWER8 systems with the introduction of PCIe Gen4 integrated controllers.
  The IBM Power System E950 server utilizes 8-core, 10-core, 11-core, or 12-core POWER9 processor modules and delivers a system with up to 32 cores typical 3.6 - 3.8 GHz (max), up to 40 cores typical 3.4 - 3.8 GHz (max), up to 44 cores typical 3.2 - 3.8 GHz (max), or up to 48 cores typical 3.15 - 3.8 GHz (max). A minimum of two processor modules must be installed in each system, with a minimum quantity of one processor module's cores activated.

  An IBM Power System E950 server can utilize 8 GB, 16 GB, 32 GB, 64 GB, or 128 GB DDR4 ISDIMMs (up to 16 Industry Standard (IS)DIMMs per socket) to enable a maximum configuration of 16 TB. A minimum of 50% or 128GB, whichever is higher, of installed memory must be activated.

  The PCIe capabilities provide up to Eight PCIe Gen4 x16, two PCIe Gen4 x8 and one PCIe Gen3 x8. PCIe slots support concurrent maintenance (hot plug). Additional PCIe adapters can be attached through up to four PCIe I/O Expansion Drawers, providing up to 48 additional PCIe Gen3 slots.

  Each IBM Power System E950 server has eight SFF (2.5 in.) SAS bays for HDDs or SSDs, plus four NVMe 2.5-inch bays. One or two PCIe SAS adapters support these SAS bays. One of these SAS options must be selected:

  - DASD Backplane with no HDD/SDD drive selected. No PCIe SAS adapter is required
  - Base DASD backplane together with one SAS PCIe adapter and select SAS drives
  - Split DASD backplane together with two SAS PCIe adapters and select SAS drives

NVMe drive options can be selected with any of the above SAS options.

All SAS bays support concurrent maintenance (hot plug). In addition to the eight internal drives, more HDD or SSD drives can be attached through EXP24SX or EXP12SX expansion drawers.

The external USB DVD plugs into one of the two front USB ports.

Every IBM Power System E950 server comes standard with phase-redundant, power regulators for processors, memory, disk, and I/O. Hot-plug, redundant power supplies and a hot-plug Time of Day battery are also standard, and Active Memory Mirroring for Hypervisor is available as an option.

Model abstract 9040-MR9

The IBM Power System E950 server (9040-MR9) is an enhanced 4-socket, 4U server that provides a significant enhancement to IBM Power Systems 4-socket servers. It is ideal for cloud deployments with built-in virtualization, flexible capacity, and guaranteed utilization.

Summary of IBM Power System E950 features:

- IBM POWER9 processor modules with 8, 10, 11, or 12 POWER9 processor cores
  - 8-core processor modules provide up to 32 cores per system typical 3.6 - 3.8 GHz (max).
  - 10-core processor modules provide up to 40 cores per system typical 3.4 - 3.8 GHz (max).
  - 11-core processor modules provide up to 44 cores per system typical 3.2 - 3.8 GHz (max).
  - 12-core processor modules provide up to 48 cores per system typical 3.15 - 3.8 GHz (max).
- 128 GB to 16 TB high-performance industry standard double data rate (ISDDR) memory
  - A two-processor module configuration provides 64 ISDIMM slots.
  - A four-processor module configuration provides 128 ISDIMM slots and a server maximum of 16 TB.
- PCIe slots
  - System unit supports up to 10 PCIe Gen4 slots.
  - One PCIe Gen3 reserved for default Ethernet adapter.
  - PCIe I/O Expansion Drawers support up to 48 additional PCIe slots.
- Standard PCIe3 SAS controllers (#EJ0K) for internal disk bays
  - Eight SFF (2.5 in.) SAS bays for HDDs or SSDs
- Four NVMe U.2 bays
- Integrated USB controller provides 2 front and two rear USB ports. External DVD plugs into front USB port
- Additional storage can be attached
  - Up to 1,536 SFF-2 bays for HDDs and SSDs with 64 EXP24SX or EXP12SX I/O drawers
  - Fibre Channel and LAN adapters
- Elastic capacity on demand for both cores and memory
- Power to Cloud Rewards
- Active Memory Expansion and Active Memory Mirroring for Hypervisor
- Packaged in a standard 19-inch rack-mount 4U drawer
- Support for IBM AIX and Linux operating systems

↑ Back to top

Highlights

The IBM Power System E950 server (9040-MR9) is an enhanced 4-socket, 4U server that provides a significant enhancement to IBM Power Systems 4-socket servers. It is ideal for cloud deployments with built-in virtualization, flexible capacity, and guaranteed utilization.

Summary of IBM Power System E950 features:

- IBM POWER9 processor modules with 8, 10, 11, or 12 POWER9 processor cores
  - 8-core processor modules provide up to 32 cores per system typical 3.6 - 3.8 GHz (max).
  - 10-core processor modules provide up to 40 cores per system typical 3.4 - 3.8 GHz (max).
  - 11-core processor modules provide up to 44 cores per system typical 3.2 - 3.8 GHz (max).
  - 12-core processor modules provide up to 48 cores per system typical 3.15 - 3.8 GHz (max).
- 128 GB to 16 TB high-performance industry standard double data rate (ISDDR) memory
  - A two-processor module configuration provides 64 ISDIMM slots.
  - A four-processor module configuration provides 128 ISDIMM slots and a server maximum of 16 TB.
- PCIe slots
  - System unit supports up to 10 PCIe Gen4 slots.
  - One PCIe Gen3 reserved for default Ethernet adapter.
  - PCIe I/O Expansion Drawers support up to 48 additional PCIe slots.
- Standard PCIe3 SAS controllers (#EJ0K) for internal disk bays
  - Eight SFF (2.5 in.) SAS bays for HDDs or SSDs
- Four NVMe U.2 bays
- Integrated USB controller provides 2 front and two rear USB ports. External DVD plugs into front USB port
- Additional storage can be attached
  - Up to 1,536 SFF-2 bays for HDDs and SSDs with 64 EXP24SX or EXP12SX I/O drawers
  - Fibre Channel and LAN adapters
- Elastic capacity on demand for both cores and memory
- Power to Cloud Rewards
- Active Memory Expansion and Active Memory Mirroring for Hypervisor
- Packaged in a standard 19-inch rack-mount 4U drawer
- Support for IBM AIX and Linux operating systems

Back to top

Description

Summary of features

The following features are available on the IBM Power System E950 server:

- The IBM Power System E950 server supports 16 to 48 processor cores with two to four POWER9 processor modules:
  - 8-core processor modules provide up to 32 cores per system typical 3.6 - 3.8 GHz (max).
  - 10-core processor modules provide up to 40 cores per system typical 3.4 - 3.8 GHz (max).
  - 11-core processor modules provide up to 44 cores per system typical 3.2 - 3.8 GHz (max).
  - 12-core processor modules provide up to 48 cores per system typical 3.15 - 3.8 GHz (max).
- 128 GB - 16 TB high-performance DDR4 memory with L4 cache:
  - 8 GB ISDIMM Memory (#EM6A)
  - 16 GB ISDIMM Memory (#EM6B)
  - 32 GB ISDIMM Memory (#EM6C)
  - 64 GB ISDIMM Memory (#EM6D)
  - 128 GB ISDIMM Memory (#EM6E)
  - Optional Active Memory Expansion (#EMAM)
- Choice of three storage backplane features. Each Power E950 server has eight SFF (2.5 in.) SAS bays for HDDs or SSDs, plus four NVMe 2.5-inch bays. One or two PCIe SAS adapter support these SAS bays. One of these SAS options must be selected:
  - DASD Backplane with no HDD/SDD drive selected. No PCIe SAS adapter is required (#EJ0B)
  - Base DASD backplane together with one SAS PCIe adapter and select SAS drives (#EJBB)
  - Split DASD backplane together with two SAS PCIe adapters and select SAS drive (#EJSB)
- Up to 11 hot-swap PCIe slots in the system unit:
  - Four, six, or eight x16 Gen4 full-height, half-length slots.
  - Two x8 Gen4 full height, half length slots
  - One x8 Gen3 full-height, half-length slot generally is used for an Ethernet adapter
  - With two processor modules, there are seven PCIe slots; with three modules, there are nine PCIe slots; and with four modules, there are eleven PCIe slots in the system unit.
- The PCIe I/O Expansion Drawer (#EMX0) expands the number of full-high, hot-swap slots:
  - Up to two PCIe drawers with two processor modules (maximum 31 slots on the server)
  - Up to four PCIe drawers with four processor modules (maximum 51 slots on the server)
- Up to 64 EXP24SX SFF (#ESLS) or EXP12SX LFF (#ESLL) Drawers can be attached, providing up to 1,536 SAS bays for disks or SSDs.
- System unit I/O (integrated I/O)
  - USB ports: four 3.0 (two front) for general use and 2.0 (rear) for limited use
  - HMC ports: two 1 GbE RJ45
  - System (serial) port: one RJ45
- Four hot-plug and redundant power supplies 2000 W (200 - 240 V AC) (#EB3M)
- System unit only 4U in a 19-inch rack-mount hardware
- Primary operating systems:
  - AIX (#2146) (small-tier licensing)
  - Linux (#2147): RHEL, SLES, and Ubuntu

Processor modules

- The Power E950 server supports 16 to 48 processor cores:
  - 8-core typical 3.6 - 3.8 GHz (max) #EPWR POWER9 Processor
  - 10-core typical 3.4 - 3.8 GHz (max) #EPWS POWER9 Processor
  - 11-core typical 3.2 - 3.8 GHz (max) #EPWY POWER9 Processor
  - 12-core typical 3.15 - 3.8 GHz (max) #EPWT POWER9 Processor
- A minimum of two and a maximum of four processor modules are required for each system. The modules can be added to a system at a later time through an MES order, but will require scheduled downtime to install. All processor modules in one server must be the same gigahertz (same processor module feature number). They cannot be mixed.
- Permanent CoD processor core activations are required for the first processor module in the configuration and are optional for the second and fourth modules. Specifically:
  - Two or four 8-core, typical 3.6 - 3.8 GHz (max) processor modules (#EPWR) require eight processor core activations (#EPWV) at a minimum.
  - Two or four 10-core, typical 3.4 - 3.8 GHz (max) processor modules (#EPWS) require ten processor core activations (#EPWW) at a minimum.
  - Two or four 11-core, typical 3.2 - 3.8 GHz (max) processor modules (#EPWY) require eleven processor core activations (#EPN3) at a minimum.
  - Two or four 12-core, typical 3.15 - 3.8 GHz (max) processor modules (#EPWT) require twelve processor core activations (#EPWX) at a minimum.
- Temporary CoD capabilities are optionally used for processor cores that are not permanently activated:
  - 90 Days Elastic CoD Processor Core Enablement (#EP9T).
  - 1 and 100 Processor Day Elastic CoD billing for #EPWR (#EPN0, #EPN1).
  - 1 and 100 Processor Day Elastic CoD billing for #EPWS (#EPN5, #EPN6).
  - 1 and 100 Processor Day Elastic CoD billing for #EPWY (#EPN8, #EPN9).
  - 1 and 100 Processor Day Elastic CoD billing for #EPWT (#EPNK, #EPNL).
  - 100 Processor-minutes Utility CoD billing: for #EPWR (#EPN2), for #EPWS (#EPN7), for #EPWY (#EPNN) or for #EPWT (#EPNM).
  - An HMC is required for temporary CoD.

Notes:

- A minimum of two processor features is required on each system.
- Mixing of different processor features on the same system is not allowed.

System memory

- 128 GB - 16 TB high-performance 1600 MHz DDR4 ECC memory with L4 cache:
  - 8 GB ISDIMM Memory (#EM6A)
  - 16 GB ISDIMM Memory (#EM6B)
  - 32 GB ISDIMM Memory (#EM6C)
  - 64 GB ISDIMM Memory (#EM6D)
  - 128 GB ISDIMM Memory (#EM6E)
- As the client memory requirements increase, the system capabilities are increased as follows:
  - With two processor modules installed, 64 ISDIMM slots are available; minimum memory is 128 GB.
  - With four modules, 128 ISDIMM slots are available; minimum memory is 256 GB. Thirty two ISDIMMs are available per socket.
  - The more ISDIMM slots that are filled, the larger the available bandwidth available to the server.
    Permanent CoD memory activations are required for at least 50% of the physically installed memory or 128 GB of activations, whichever is larger. Use 1 GB activation (#EMAP) and 100 GB activation (#EMAQ) features to order permanent memory activations.
- Temporary CoD for memory is available for memory capacity that is not permanently activated:
  - 90 Days Elastic CoD Memory Enablement (#EM9U).
  - 8 GB-Day billing for Elastic CoD memory (#EMJE).
  - 800 GB-Day billing for Elastic CoD memory (#EMJF).
  - An HMC is required.

Temporary CoD Memory Days can also be acquired through IBM Marketplace after system installation. For more information about new Elastic CoD features, see the IBM Digital MarketPlace website.

Notes:

- Memory is ordered in quantity of 8 of the same memory feature.
- Second memory riser card of each processor can have different ISDIMM capacity from that on first riser but it is recommended that the 2nd riser card has the same type and size DIMMs as the 1st riser card. It is also recommended that the amount of memory per processor should be the same or about the same.
- A minimum of one memory riser with eight ISDIMMs for each installed POWER9 processor is required.
- The minimum memory supported per two POWER9 processors installed is 128 GB.
- The minimum memory supported per four POWER9 processors installed is 256 GB.

I/O support

PCIe slots

The IBM Power System E950 server has up to 10 PCIe Gen4 and 1 PCIOe Gen3 general purpose hot-plug slots, providing configuration flexibility and expandability. Eight adapter slots are x16 Gen4, two adapter slots are x8 Gen4, and one adapter slot x8 Gen3 (generally reserved for base Ethernet adapter). All adapter slots are full height, half length.

The number of slots supported vary by the number of processor modules.

Processor modules	2 socket	4 socket
x16 Gen4 slots (CAPI capable)	4	8
x8 Gen4 slots	2	2
x8 Gen3 slots	1	1

Notes:

- The PCIe Gen3 slot, C6, is reserved for an Ethernet adapter to help ensure proper manufacture and test of the server.
- Blind-swap cassettes (BSC) are used for adapters in the system unit.
- All PCIe slots in the system unit are SR-IOV capable.
- PCIe slot C12 must contain the SAS RAID adapter (#EJ0K) when controlling the Base internal SAS drive bays. The SAS RAID adapter in this slot will not support a Dual Storage Adapter configuration.
- PCIe slots C12 and C9 must each contain a SAS RAID controller (#EJ0K) when controlling the Spilt internal SAS drive bays. The SAS RAID adapters in these slots will not support a Dual Storage Adapter configuration.

The x16 slots can provide up to twice the bandwidth of x8 slots because they offer twice as many PCIe lanes. PCIe Gen4 slots can support up to twice the bandwidth of a PCIe Gen3 slot and up to four times the bandwidth of a PCIe Gen2 slot, assuming an equivalent number of PCIe lanes. PCIe Gen1, PCIe Gen2, PCIe Gen3, and PCIe Gen4 adapters can be plugged into a PCIe Gen4 slot, if that adapter is supported. The x16 slots can be used to attach PCI Gen3 I/O Expansion drawers.

This server is smarter than earlier servers about energy efficiency for cooling the PCIe adapter environment. They can sense which IBM PCIe adapters are installed in their PCIe slots. If an adapter is known to require higher levels of cooling, they automatically speed up fans to increase airflow across the PCIe adapters.

SAS bays and storage backplane options

Clients have a choice of three storage features. Each Power E950 server has eight SFF (2.5 in.) SAS bays for HDDs or SSDs, plus four NVMe 2.5-inch bays. One or two PCIe SAS adapter support these SAS bays. One of these SAS options must be selected:

- DASD Backplane with no HDD/SDD drive selected. No PCIe SAS adapter is required (#EJ0B)
- Base DASD backplane together with one SAS PCIe adapter and select SAS drives (#EJBB)
- Split DASD backplane together with two SAS PCIe adapters and select SAS drive (#EJSB)

NVMe drive options can be selected with any of the above SAS options.

The base and the split 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 tray or carrier. Thus, any drives that are designated for SFF-1, or SFF-2 bays do not fit in an SFF-3 bay. All SFF-3 bays support concurrent maintenance or hot-plug capability. These backplane options support HDDs or SSDs or a mixture of HDDs and SSDs in the SFF-3 bays. If mixing HDDs and SSDs, they must be in separate arrays.

The base and the split 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. RAID 6 or RAID 10.

Notes:

- All three of these backplane options are supported by AIX, Linux, and VIOS. It is highly recommended that 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. Scheduled downtime is required to remove the existing storage backplane and install a different backplane.

USB DVD external and boot devices

IBM Power System 9040-MR9 provides two front USB ports, mainly to support the external USB DVD.

System boot is supported through these options:

1. NVMe drives
2. Internal SAS drives
3. Disk or SSD located in an EXP24SX or EXP12SX drawer attached to a PCIe SAS adapter
4. A network through LAN adapters
5. A SAN attached to Fibre Channel or FCoE adapters and indicated to the server by the 0837 specify code
6. USB front port for external USB based DVD
7. USB front port for USB memory key / flash drive

Assuming option 1 above, the minimum system configuration requires at least one NVMe disk drive in the system for AIX and Linux. If you are not using option 1 or 2 above, an internal disk is not required.

I/O drawer attachment

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 Gen1 slots. Though most PCIe adapters in the feature 5802 or 5877 drawers can be moved to this server and its disk drives converted and moved to the feature ESLS EXP24SX drawer, the feature 5802 and 5877 drawers are not supported on this newer IBM Power Systems technology-based server. Similarly, the GX++ attached EXP30 Ultra SSD Drawer (#EDR1 or #5888) is not supported.

Up to 64 EXP24SX or EXP12SX storage drawers can be attached to a IBM Power System E950 server. With 24 drives per drawer, this means up to 1,536 SFF-2 drives are supported. A maximum of 16 EXP24SX per PCIe Gen3 I/O drawer is supported due to cable management considerations.

The older 3.5-inch-based EXP12S SAS Disk Drawer (#5886) and EXP24 SCSI Disk Drawer (#5786) 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.

PCIe I/O Expansion Drawer

PCIe I/O Expansion Drawers (#EMX0) can be attached to the system unit to expand the number of full-high, hot-swap slots available to the server. The maximum number of PCIe I/O drawers depends on the number of processor modules physically installed. The maximum is independent of the number of processor core activations.

- Up to two PCIe drawers with two processor modules.
- Up to four PCIe drawers with four processor modules.
- The 19-inch 4 EIA (4U) PCIe I/O Expansion Drawer (#EMX0) and two PCIe fanout modules (#EMXG) provide 12 PCIe I/O full-length, full-height slots. One fanout module provides six PCIe slots labeled C1 through C6. Slots C1 and C4 are x16 slots, and C2, C3, C5, and C6 are x8 slots. Slots C1 and C4 of the 6-slot fanout module in a PCIe Gen3 I/O drawer are SR-IOV enabled.
- An EMX0 drawer can be configured with one or two EMXG fanout modules. Adding a second fanout module is not a hot-plug operation and requires scheduled downtime.
- PCIe Gen1, Gen2, and Gen3 full-high adapter cards are supported. The set of full-high PCIe adapters that are supported is found in the Sales Manual, identified by feature number. See the PCI Adapter Placement manual for the 9040-MR9 for details and rules associated with specific adapters supported and their supported placement in x8 or x16 slots.

- Each fanout module requires one PCIe Cable Adapter (#EJ08), which is placed in a x16 PCIe slot of the system unit.
- A cable pair attaches the PCIe Cable Adapter (#EJ08) to the fanout module. Feature ECC7 provides a pair of 3-meter optical cables with transceivers. Feature ECC8 provides a pair of 10-meter optical cables with transceivers. Feature ECCS provides a pair of 3-meter copper cables. Two cables of identical length, or one feature, is required for each fanout module. Optical cables are smaller diameter and more flexible and can be longer than the copper cables. Copper cables are lower cost. Copper and optical cables have the same performance and reliability characteristics.
- The cable adapter (#EJ08) can be placed in any of the system units' available x16 slots and attached to any fanout module in any of the server's PCIe I/O drawers (#EMX0). The PCIe I/O drawer cannot be shared by two different servers.
- Recommendation: Locate any attached PCIe I/O Expansion Drawer in the same rack as the POWER9 server for ease of service. But the drawers can be installed in separate racks if the application or other rack content requires it. It is recommended to use 3-meter cables for PCIe drawers in the same rack as the system unit and 10-meter cables for drawers located in a different rack.
- Concurrent repair and add/removal of PCIe adapter cards is done by HMC-guided menus or by operating system support utilities.
- When the operating system is Linux, PowerVM is required for support of the I/O Expansion Drawer.

Rack cable brackets

The cable bracket is used to secure the communications cables so that they can be raised to remove the Blind swap cassettes containing the PCIe adapters. To enable the server to be pulled forward on its rails for service access to memory, processors and voltage regulator modules requires the disconnecting the cables from the server.

Integrated I/O ports

There are two HMC ports, one system port, and four USB ports (two general purpose and two limited use).

The two HMC ports are located on the service processor in the rear of the server and are RJ45. These ports support 1 Gb Ethernet connections leveraging the second-generation service processor technology called an FSP2 in some IBM publications.

The one integrated system or serial port has an RJ45 style connector 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 an 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.

Integrated system port is 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 port is supported for modem and TTY 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 port does not support HACMP configurations.

Two USB-3 ports are located on the front of the server for general client use, and two USB-3 ports on the rear are for limited client use. A converter cable, feature ECCF, provides a USB-to-9-pin D-Shell connection to some UPS. The IBM 9910 Uninterruptible Power Systems, models E66 and E67, are supported as purchase options with the 9040-MR9.

Racks

The IBM Power System E950 server is designed to fit a standard 19-inch rack. IBM Development has tested and certified the system for the following rack support:

- 7965-S42 (42U) (Field integration only)
- 7014-T42 (42U) (Field integration only)

Clients can choose to place the server in other racks if they are confident those racks have the strength, rigidity, depth, and hole-pattern characteristics that are needed. Clients should work with IBM Service to determine the appropriateness of other racks. The IBM Power System E950 rails can adjust their depth to fit a rack that is 22.75 inches - 30.5 inches in depth based on the adjustable outer brackets going from the front rail to the rear rail. Racks from IBM include:

- 7014-T00 (36U) (Support only, cannot be ordered from IBM)

IBM Manufacturing does not support the use of other racks with the Power E950 initial system order or model upgrade. The 7965-S42 (#ECR0) or 7014-T42 (#0553) are 2-meter enterprise rack that provides 42U or 42 EIA of space.

Additional E950 PCIe I/O drawers (#EMX0) for an already installed server can be MES ordered with or without a rack.

Typical good cable management practices apply. For example, it is usually a good practice to leave 1U or 2U open at the top or bottom of the rack for cables exiting the rack or to hold extra cable lengths. Or if you have more than four PCIe I/O drawers in the same rack, carefully consider how many 4-port PCIe adapters have cables attached to all their ports. If you are not using something like the 8-inch extension for a 7965-S42 rack for extra space to lay the cables, service access can be a challenge, especially with thicker I/O cables. Or another example, if there are a lot of I/O cables in the rack, horizontally mounting the power distribution units (PDUs) versus mounting them vertically in the side pockets eases service access.

Rack front door options supported are the acoustic door (#6248 or #6249), the attractive geometrically accented door (#ERG7), and the cost-effective plain front door (#6068 or #6069). The front trim kit is also supported (#6263 or #6272).

Power distribution units

Using previously provided IBM PDU features 7188, 7109, and 7196 reduces the number of IBM Power System E950 servers and other equipment that can be held most efficiently in a rack. The high-function PDUs provide more electrical power per PDU and thus offer better "PDU footprint" efficiency. In addition, they are intelligent PDUs that provide insight to actual power usage by receptacle and also provide remote power on/off capability for easier support by individual receptacle. The new PDUs are features EPTJ, EPTL, EPTN, and EPTQ.

IBM Manufacturing will only integrate the newer PDUs with the IBM Power System E950 server. IBM Manufacturing does not support integrating earlier PDUs such as the feature 7188, 7109, or 7196. Clients can choose to use older IBM PDUs in their racks, but will have to install those earlier PDUs at their site.

	1-phase or 3-phase wye depending on country wiring standards	3-phase 208 V depending on country wiring standards
Nine C19 receptacles	EPTJ	EPTL
Twelve C13 receptacles	EPTN	EPTQ

- High Function 9xC19 PDU: Switched, Monitoring (#EPTJ). This is an intelligent, switched 200 - 240 V AC 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. 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. 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.

- High Function 9xC19 PDU 3-Phase: Switched, Monitoring (#EPTL). This is an intelligent, switched 208 V 3-phase AC 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. 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 number) and has an 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.
- High Function 12xC13 PDU: Switched, Monitoring (#EPTN). This is an intelligent, switched 200 - 240 V AC 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. 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. 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.
- High Function 12xC13 PDU 3-Phase: Switched, Monitoring (#EPTQ). This is an intelligent, switched 208 V 3-phase AC 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. 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 number) 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.

Lifting considerations

Three to four service personnel are required to manually remove or insert a system unit into a rack, given its dimensions and weight and content. To avoid the need for this many people to assemble at a client site for a service action, a lift tool can be very useful. Similarly, if the client has chosen to install this CSU (customer setup) system, similar lifting considerations apply.

The IBM Power System E950 server has a maximum weight of 70.3 kg (155 lb). However, by temporarily removing the power supplies, fans, and RAID assembly, the weight is easily reduced to a maximum of 55 kg (121 lb).

When lowering the IBM Power System E950 server onto its rails in the rack, the server must be tilted on one end about 15 degrees so that the pins on the server enclosure fit onto the rails. This equates to lifting one end of the server about 4 cm (1.6 in.). This can be done using a tip plate on a lift tool or manually adjusting the load on a lift tool or tilting during the manual lift. Consider the optional feature EB2Z Lift Tool.

PowerVM Enterprise Edition License Entitlement is now included with each IBM Power System E950 server.

PowerVM Enterprise Edition is available as a hardware feature (#EPVV) and supports up to 20 partitions per core, VIOS, and multiple shared processor pools. It also offers Live Partition Mobility, Active Memory Sharing, and PowerVP performance monitoring.

Other PowerVM technologies include:

- System Planning Tool simplifies the process of planning and deploying IBM Power Systems LPARs and virtual I/O.
- Virtual I/O Server (VIOS) is a single-function appliance that resides in an IBM Power System partition. It facilitates the sharing of physical I/O resources between AIX, Linux, and client partitions within the server. VIOS provides shared Ethernet adapter (SEA) virtual I/O to client LPARs.
- Virtual SCSI (VSCSI) enables the sharing of physical storage adapters (Fibre Channel) and storage devices (disk and optical) between logical partitions.
- With virtual networking, a SEA enables connectivity between internal and external virtual LANs (VLANs); virtual Ethernet provides high-speed connections between partitions.

With Live Partition Mobility, you can move a running AIX or Linux VMs from one physical server to another with no downtime. Use this capability to:

- Evacuate workloads from a system before performing scheduled maintenance.
- Move workloads across a pool of different physical resources as business needs shift.
- Move workloads away from underutilized machines so that they can be powered off to save on energy and cooling costs.
- Move your workloads to new POWER8 systems for upgrades without having to schedule an outage. With Active Memory Sharing, memory is dynamically moved between running partitions for optimal resource usage.

Active Memory Expansion

Active Memory Expansion is an innovative technology supporting the AIX operating system that helps enable the effective maximum memory capacity to be larger than the true physical memory maximum. Compression/decompression of memory content can enable memory expansion up to 100% or more. This can enable a partition to do significantly more work or support more users with the same physical amount of memory. Similarly, it can enable a server to run more partitions and do more work for the same physical amount of memory.

Active Memory Expansion uses CPU resource to compress/decompress the memory contents. The trade-off of memory capacity for processor cycles can be an excellent choice, but the degree of expansion varies on how compressible the memory content is. It also depends on having adequate spare CPU capacity available for this compression/decompression.

POWER9 chips include a hardware accelerator designed to boost Active Memory Expansion efficiency and use less POWER core resource. The POWER9 accelerator includes some minor enhancements and also leverages POWER9 higher bandwidth and lower latency characteristics.

You have a great deal of control over Active Memory Expansion usage. Each individual AIX partition can turn on or turn off Active Memory Expansion. Control parameters set the amount of expansion desired in each partition to help control the amount of CPU used by the Active Memory Expansion function. An IPL is required for the specific partition that is turning on memory expansion. When turned on, monitoring capabilities are available in standard AIX performance tools such as lparstat, vmstat, topas, and svmon.

A planning tool is included with AIX, enabling you to sample actual workloads and estimate both how expandable the partition's memory is and how much CPU resource is needed. Any IBM Power Systems model can run the planning tool. In addition, a one-time, 60-day trial of Active Memory Expansion is available to enable more exact memory expansion and CPU measurements. You can request the trial using the Power Systems Capacity on Demand web page.

Active Memory Expansion is enabled by chargeable hardware feature EMAM, which can be ordered with the initial order of the system node or as an MES order. A software key is provided when the enablement feature is ordered, which is applied to the system node. An IPL is not required to enable the system node. The key is specific to an individual system node and is permanent. It cannot be moved to a different server.

The additional CPU resource used to expand memory is part of the CPU resource assigned to the AIX partition running Active Memory Expansion. Normal licensing requirements apply.

Capacity on demand

Several types of capacity on demand (CoD) processors are optionally available for the IBM Power System E950 server. They help meet changing resource requirements in an on demand environment by using resources installed on the system but not activated.

Capacity upgrade on demand (CUoD) enables you to purchase additional permanent processor or memory capacity and dynamically activate it when needed.

There are two ways clients can order Elastic capacity on demand (Elastic CoD). With IBM Marketplace, clients can now order and provision Elastic CoD in minutes through the web. For more information about new Elastic CoD features, see the IBM Digital MarketPlace website.

An additional way to order Elastic COD is through e-config features

Elastic CoD enables processors or memory to be temporarily activated in full-day increments as needed. Charges are based on usage reporting collected monthly. Processors and memory can be activated and turned off an unlimited number of times, whenever you want additional processing resources.

With this offering, system administrators have an interface at the HMC to manage the activation and deactivation of resources. A monitor that resides on the server logs the usage activity. You must send this usage data to IBM monthly. A bill is then generated based on the total amount of processor and memory resources utilized, in increments of processor and memory (8 GB) days. Before using temporary capacity on your server, you must enable your server. To do this, order an enablement feature (MES only) and sign the required contracts.

Use the following features to order activation features and support billing charges on the Power E950 (9040-MR9) server:

Processor module feature	Elastic CoD processor enablement feature	Elastic CoD AIX/Linux processor billing feature (1 and 100 proc-day)
EPWR (8-core module)	EP9T	EPN0, EPN1
EPWS (10-core module)	EP9T	EPN5, EPN6
EPWY (11-core module)	EP9T	EPN8, EPN9
EPWT (12-core module)	EP9T	EPNK, EPNL

Memory feature	Elastic CoD memory enablement feature	Elastic CoD memory billing feature (8 and 800 GB-day)
EM8P (16 GB)	EM9U	EMJE, EMJF
EM8Q (32 GB)	EM9U	EMJE, EMJF
EM8R (64 GB)	EM9U	EMJE, EMJF
EM8S (128 GB)	EM9U	EMJE, EMJF

Note: After CoD contracts are in place, inactive processor cores and inactive memory can be enabled for Elastic CoD usage.
The Elastic CoD processor consists of three steps: enablement, activation, and billing

- Elastic CoD enablement: Description
  Before requesting temporary capacity on a server, you must enable it for Elastic CoD. To do this, order a no-charge enablement feature (MES only) and sign the required contracts or click to accept the terms on the CoD website. IBM will generate an enablement code, mail it to you, and post it on the web for you to retrieve and enter on your server. A processor enablement code lets you request up to 90 processor days of temporary unused CoD processor capacity for all your processor cores that have not been permanently activated. For example, if you have 16 processor cores that are not permanently activated, the processor enablement code allows up to 1,440 processor days (16 x 90). If you have reached or are about to reach the limit of 90 processor days per nonactivated processor core, obtain another enablement code through the web or by placing an order for another processor enablement code to reset the number of days you can request. Similarly, a memory enablement code lets you request up to 90 days of temporary unused CoD memory capacity for all your gigabytes of memory that have not been permanently activated. For example, if you had 100 GB of memory that was not permanently activated, the memory enablement code allows up to 9000 GB memory days (100 x 90). If you have reached the limit of 90 memory days per nonactivated memory, obtain another memory enablement code to reset the number of days you can request. Note that one 90-day enablement can be used over many months (more than three months) assuming your usage is modest.

  See the CoD website for additional detail.

- Elastic activation requests:
  When Elastic CoD temporary capacity is needed, simply use the HMC menu for Elastic CoD and specify how many of the inactive processors or how many gigabytes of memory you would like temporarily activated for some number of days. You will be billed for the days requested, whether the capacity is assigned to partitions or left in the shared processor pool. At the end of the temporary period (days you requested), you must ensure the temporarily activated capacity is available to be reclaimed by the server (not assigned to partitions) or you will be billed for any processor days not returned (per the contract you signed).

- Elastic CoD billing:
  When the Elastic CoD is enabled, you are required to report billing data at least once a month (whether there is activity or not). This data is used to determine the proper amount to bill at the end of each billing period (calendar quarter). Failure to report billing data for use of temporary processor or memory capacity during a billing quarter will result in default billing equivalent to 90 processor days of temporary capacity. The sales channel will be notified of client requests for temporary capacity. As a result, the sales channel must order a quantity of billing features (using the appropriate billing features for each billable processor and memory day reported less any outstanding credit balance of processor and memory days).

  For more information regarding registration, enablement, and usage of Elastic CoD, see the IBM Power Hardware CoD website.

Note: Previously, Elastic CoD was called On/Off CoD. Some documentation still refers to this capability as "On/Off."
Utility CoD

Utility CoD provides additional processor performance on a temporary basis within the shared processor pool. Utility CoD enables you to place a quantity of inactive processors into the system node's shared processor pool, which then becomes available to the pool's resource manager. When the system node recognizes that the combined processor utilization within the shared pool exceeds 100% of the level of base (purchased/active) processors assigned across uncapped partitions, then a Utility CoD Processor Minute is charged and this level of performance is available for the next minute of use. If additional workload requires a higher level of performance, the system will automatically enable the additional Utility CoD processors to be used. The system continuously monitors and charges for the performance needed above the base (permanent) level. Registration and usage reporting for Utility CoD is made using a public website, and payment is based on reported usage. Utility CoD requires PowerVM Enterprise Edition to be active on the 9040-MR9.

Processor module feature	Utility CoD billing feature 100 processor minutes
EPWR (8-core module)	EPN2
EPWS (10-core module)	EPN7
EPWY (11-core module)	EPNN
EPWT (12-core module)	EPNM

For more information regarding registration, enablement, and use of Utility CoD, go to the Utility Capacity on Demand website.

Trial capacity on demand (Trial CoD): You can request either a standard or an exception trial at the Trial Capacity on Demand website.

Software licensing

For software licensing considerations with the various CoD offerings, see the latest revision of the Capacity on Demand Planning Guide at the Power Systems Capacity on Demand website.

IBM Power System E950 Solution Edition for Healthcare

The IBM Power System E950 Solution Edition for Healthcare provides a cost-effective 44-core/512GB and 48-core/512 GB processor and memory activation feature package for eligible healthcare industry clients running approved ISV applications; for example, Epic.

44 Processor and memory option:

- Solution Edition for Healthcare 11-core typical 3.20 - 3.8 GHz processor (#EHC7)
- Base Processor Activations (11) for #EHC7 (#ELB0)
- Base Memory Activation (128 GB) for #EHC7 (#EMAN)

48 Processor and memory option:

- Solution Edition for Healthcare 12-core typical 3.15 - 3.8 GHz processor (#EHC4)
- Base Processor Activations (12) for #EHC4 (#ELAN)
- Base Memory Activation (128 GB) for #EHC4 (#EMAN)

The Power E950 Solution Edition for Healthcare minimum requirement is a server with 4x typical processor modules, with all cores active, and 512 GB memory (all active).
Note: Additional memory and other hardware components can be added as desired following normal supported configuration rules.

For eligibility rules and registration of the Power Solution Edition for Healthcare by the sales channel, go to the IBM Power Solution Editions website.

Reliability, Availability, and Serviceability

Reliability

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 ensure product quality.

IBM Power System E950 System RAS

Every IBM Power System E950 server comes standard with phase-redundant power regulators for processors and memory. The memory regulators supply power to the DIMM memory riser cards and several processor voltage domains. Hot-plug, redundant power supplies and a concurrent maintenance of real time clock battery are also standard, and Active Memory Mirroring for Hypervisor is available as an option.

Processor VRM and Memory VRM are pluggable. Standby VRM and IO VRM aslo come with phase redundancy and are pluggable.

Power E950 comes with dual line cord redundancy along with n+1 power supply redundancy, also has n+1 fan rotor redundancy.

Memory subsystem RAS

The memory has error detection and correction circuitry designed such that the failure of any one specific DRAM module within an ECC word by itself can be corrected absent any other fault. The ECC word spans two DIMMs. In addition, there is a spare DRAM module per rank per DIMM pair.

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 a 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 IBM Power Systems family does ambient and over temperature monitoring and reporting.

POWER9 processor functions

As in POWER8, the POWER9 processor has the ability to do processor instruction retry for some transient errors as well as provide core-contained checkstops for certain solid faults.

Cache availability

The L2 and L3 caches in the POWER9 processor 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 the PowerVM environment.

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 modified cache data 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. When and if data is used, I/O adapters controlled by an I/O hub controller would freeze if data were transferred to an I/O device, otherwise termination may be limited to the program/kernel or the if data is not owned by the hypervisor;

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 client, an IBM representative, or an authorized warranty service provider.

The serviceability features delivered in this system help 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)
- Error 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
- Automatic reporting of serviceable events to IBM through the Electronic Service Agent Call Home application
- 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) or REST API. An HMC attached to the system enables support personnel (with client authorization) to remotely, or locally to the physical HMC that is in proximity of the server being serviced, log in to review error logs and perform remote maintenance if required.

The POWER9 processor-based platforms support several service environments:

- Attachment to one or more HMCs or vHMCs 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.
- 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. The primary service interface is through the operating system and the service processor.

Service interface

Support personnel can use the service interface to communicate with the service support applications in a server using an operator console, a graphical user interface on the management console or service processor, or an operating system terminal. The service interface helps to deliver a clear, concise view of available service applications, helping 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 or vHMC 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 enclosure 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

The processor and memory FFDC technology is designed to perform without the need for recreate diagnostics nor 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, concurrent maintenance of PCIe adapters is supported with PowerVM. Concurrent maintenance of the Operator Panel is supported through ASMI. Additional concurrent maintenance includes power supplies, fans, and HDD/SSD drives.

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.

QR labels

QR labels are placed on the system to provide access to key service functions through a mobile device. When the QR label is scanned, it will go to a landing page specific to that server which contains many of the service functions of interest while physically located at the server. These include things such as installation and repair instructions, service diagrams, reference code look up, and so on.

Packaging for service

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

- Color coding (touch points): Blue-colored touch points delineate touchpoints on service components where the component can be safely handled for service actions such as removal or installation.
- 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 the operating system to report platform-recoverable errors and errors associated with PCI adapters/devices.

In the HMC-managed environment, a call home service request will be initiated from the HMC 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 PowerVM Live Partition Mobility (LPM), users can migrate an AIX, IBM i or Linux VM running on one POWER 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 outages for repair of hardware and firmware faults. The IBM Power System E950 server (and other servers using POWER9-technology processors with firmware level FW920 or above) supports secure LPM, whereby the VM image is encrypted and compressed prior to transfer. Secure LPM uses on-chip encryption and compression capabilities of the POWER9 processor for optimal performance.

Service processor

Diagnostic monitoring of recoverable error from the processor chipset is performed on the system processor itself, while the fatal diagnostic monitoring of the processor chipset is performed by the service processor.

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 client 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. See 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 clients. 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 client'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 client and the IBM support team. As part of an increased focus to provide even better service to IBM clients, 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, see the "Security" section at the IBM Electronic Service Agent website.

1. Select your country.
2. Click "IBM Electronic Service Agent Connectivity Guide."

Benefits: increased uptime

Electronic Service Agent is designed to enhance the warranty and maintenance service by potentially 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 client personnel when errors are encountered in the middle of the night.

Security: The Electronic Service Agent tool is designed to help secure the monitoring, reporting, and storing of the data at IBM. The Electronic Service Agent tool is designed to help securely transmit either through the internet (HTTPS or VPN) or modem to provide clients a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into a client's system.

For additional information, see the IBM Electronic Service Agent website.

More accurate reporting

Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, clients 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

By using the IBMid entered during activation, clients 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 clients 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 client's IBMid. 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, clients 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, see the following website or contact an IBM Systems Services Representative.

Section 508 of the US Rehabilitation Act

IBM Power System E950 (9040-MR9) is capable as of August 17, 2018, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Accessibility Conformance Statement can be requested on the Product accessibility information website.

Back to top

Models

Model summary matrix

Model	Processor	Memory	System node PCIe slots	PCIe Slots System Maximum
MR9	32 cores typical 3.6 - 3.8 GHz (max); 40 cores typical 3.4 - 3.8 GHz (max); 44 cores typical 3.2 - 3.8 GHz (max); 48 cores typical 3.15 - 3.8 GHz (max)	128 GB to 16 TB	Up to 10 PCIe Gen4	Up to 24 PCIe

Customer setup (CSU)

Yes.

Devices supported

Not applicable.

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 9040-MR9 global resource activation features

From FC:	To FC:	RETURN PARTS
EP2X - Lab Services Private Cloud Capacity Assessment	EP20 - Power Enterprise Pools 2.0 Enablement	No

Feature conversions for 9040-MR9 memory features:

From FC:	To FC:	RETURN PARTS
EMAP - 1GB Memory Activation	EPQK - 1GB Base Memory activation (Pools 2.0) from Static	No
EMAQ - Quantity of 100 1GB Memory Activations	EPQL - 100GB Base Memory activation (Pools 2.0) from Static	No
EMBE - 512 GB Linux Memory Activations for MR9	EPQM - 512GB Base Memory activation (Pools 2.0) convert from Linux only	No

Feature conversions for 9040-MR9 processor features:

From FC:	To FC:	RETURN PARTS
EPWV - 1-core Processor Activation for #EPWR	EPQB - 1 core Base Proc Act (Pools 2.0) for #EPWR (from Static)	No
EPWW - 1-core Processor Activation for #EPWS	EPQC - 1 core Base Proc Act (Pools 2.0) for #EPWS (from Static)	No

EPWX - 1W Processor activation for #EPWT	EPQD - 1 core Base Proc Act (Pools 2.0) for #EPWT (from Static)	No
EPN3 - 1-core Processor Activation for #EPWY	EPQE - 1 core Base Proc Act (Pools 2.0) for #EPWY (from Static)	No
ELBG - 1-core Linux Processor Activation for #EPWR/EPWK	EPQF - 1 core Base Proc Act (Pools 2.0) for #EPWR Linux (from Static)	No
ELBP - 1-core Linux Processor Activation for #EPWS/EPWL	EPQG - 1 core Base Proc Act (Pools 2.0) for #EPWS Linux (from Static)	No
ELBH - 1-core Linux Processor Activation for #EPWT/EPWM	EPQH - 1 core Base Proc Act (Pools 2.0) for #EPWT Linux (from Static)	No
ELBR - 1-core Linux Processor Activation for #EPWY/EPWZ	EPQJ - 1 core Base Proc Act (Pools 2.0) for #EPWY Linux (from Static)	No

Feature conversions for 9080-M9S global resource activation features

From FC:	To FC:	RETURN PARTS
EP2X - Lab Services Private Cloud Capacity Assessment	EP20 - Power Enterprise Pools 2.0 Enablement	No

Feature conversions for 9040-MR9 cable features:

From FC:	To FC:	RETURN PARTS
ECC7 - 3M Optical Cable Pair for PCIe3 Expansion Drawer	ECCX - 3M Active Optical Cable Pair for PCIe3 Expansion Drawer	No
ECC8 - 10M Optical Cable Pair for PCIe3 Expansion Drawer	ECCY - 10M Active Optical Cable Pair for PCIe3 Expansion Drawer	No

Feature conversions for 9040-MR9 adapters features:

From FC:	To FC:	RETURN PARTS
ECC7 - 3M Optical Cable Pair for PCIe3 Expansion Drawer	ECCX - 3M Active Optical Cable Pair for PCIe3 Expansion Drawer	No
ECC8 - 10M Optical Cable Pair for PCIe3 Expansion Drawer	ECCY - 10M Active Optical Cable Pair for PCIe3 Expansion Drawer	No
EJ08 - PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer	EJ20 - PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	No

Feature conversions for 9040-MR9 miscellaneous features:

From FC:	To FC:	RETURN PARTS
EJ0B - Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers	EJ0C - Storage Backplane with HI Performance plus 2x24-Port	No
EJBB - Storage Backplane Base DASD 8 SAS 2.5" HDD/ SDD Controllers	EJ0C - Storage Backplane with HI Performance plus 2x24-Port	No
EJSB - Storage Backplane Split DASD 8 SAS 2.5" HDD/ SDD Controllers	EJ0C - Storage Backplane with HI Performance plus 2x24-Port	No

Feature conversions for 9040-MR9 rack related features:

From FC:	To FC:	RETURN PARTS
EMXF - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	EMXH - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	No
EMXG - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	EMXH - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	No

Feature conversions for 9040-MR9 adapters features:

From FC:	To FC:	RETURN PARTS
EJ32 - PCIe3 Crypto Coprocessor no BSC 4767	EJ33 - PCIe3 Crypto Coprocessor BSC-Gen3 4767	No

Feature conversions for 9119-MHE to 9080-M9S processor features:

From FC:	To FC:	RETURN PARTS

ELPA - SOL Edition FOR SAP HANA 4.19GHz 40 core act (IFL), 2TB Mem Act (IFL)	EFP1 - 32-core (4x8) Typical 3.9 to 4.0 GHz (max) POWER9 Processor with 5U system node drawer	Yes
ELPA - SOL Edition FOR SAP HANA 4.19GHz 40 core act (IFL), 2TB Mem Act (IFL)	EFP2 - 40-core (4x10) Typical 3.7 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes
ELPA - SOL Edition FOR SAP HANA 4.19GHz 40 core act (IFL), 2TB Mem Act (IFL)	EFP3 - 48-core (4x12) Typical 3.55 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes
ELPA - SOL Edition FOR SAP HANA 4.19GHz 40 core act (IFL), 2TB Mem Act (IFL)	EFP4 - 44-core (4x11) Typical 3.58 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes

Feature conversions for 9119-MME to 9080-M9S processor features:

From FC:	To FC:	RETURN PARTS
EPBE - Power IFL Package for HANA Solution	EFP1 - 32-core (4x8) Typical 3.9 to 4.0 GHz (max) POWER9 Processor with 5U system node drawer	Yes
EPBE - Power IFL Package for HANA Solution	EFP2 - 40-core (4x10) Typical 3.7 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes
EPBE - Power IFL Package for HANA Solution	EFP3 - 48-core (4x12) Typical 3.55 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes
EPBE - Power IFL Package for HANA Solution	EFP4 - 44-core (4x11) Typical 3.58 to 3.9 GHz (max) POWER9 Processor with 5U system node drawer	Yes

Feature conversions for 9040-MR9 miscellaneous features:

From FC:	To FC:	RETURN PARTS
EJ0B - Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers	EJBB - Storage Backplane Base DASD 8 SAS 2.5" HDD/ SDD Controllers	No
EJ0B - Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers	EJSB - Storage Backplane Split DASD 8 SAS 2.5" HDD/ SDD Controllers	No
EJBB - Storage Backplane Base DASD 8 SAS 2.5" HDD/ SDD Controllers	EJSB - Storage Backplane Split DASD 8 SAS 2.5" HDD/ SDD Controllers	No

Back to top

Technical description

- Physical specifications
- Operating environment
- Limitations
- Hardware requirements
- Software requirements

Physical specifications

IBM Power E950 (9040-MR9)

System node

- Width: 448 mm (17.5 in.)
- Depth: 902 mm (35.5 in.)
- Height: 175 mm (6.9 in.), 4 EIA units
- Weight: 69 kg (152 lb)

Note: 9040-MR9 in T42 with cable feature code ECCS to I/O drawer EMX0 needs the 8-inch rack extension ERG0 to be able to close the rear door PCIe I/O Expansion Drawer

- Width: 448 mm (17.5 in.)
- Depth: 736.6 mm (29 in.)
- Height: 177.8 mm (7.0 in.), 4 EIA units
- Weight: 54.4 kg (120 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:
  - 5°C - 45°C (41°F - 113°F) nonoperating
  - 18°C - 27°C (64°F - 80°F) recommended operating
  - 10°C - 40°C (50°F - 104°F) allowable operating
  - Derate maximum allowable dry-bulb temperature 1°C (1.8°F) per 175 m (574 ft) above 900 m (2,953 ft) up to a maximum allowable elevation of 3050 m (10000 ft).
- Relative humidity (noncondensing):
  - 5% - 80% RH nonoperating
  - 8% - 80% operating
- Maximum dew point:
  - 27°C (80°F) nonoperating
  - 24°C (75°F) operating
- Operating voltage: 200 - 240 V AC
  - Operating frequency: 50 - 60 Hz +/-3 Hz
  - Power consumption: 3,850 watts maximum (per system node)
  - Power source loading: 3.9 kVA maximum (per system node)
  - Thermal output: 14,403 Btu/hr maximum (per system node)
  - Maximum altitude: 3,050 m (10,000 ft)
    - Model 9040-MR9 use four power supply units.

  Note: To calculate the amperage, multiply the kVA by 1000 and divide that number by the operating voltage.
- Noise level: (Acoustics A-weighted Upper-Limit Sound Power Levels)
  - One typically configured Four 8-core or 12-core, 2 TB memory:
    - 7.4 bels (operating/idle: 25 C, 500 m)
  - One maximum configured Four 12-core, 2 TB memory:
    - 8.1 bels (heavy workload, 25 C, 500 m)

The Power E950 server must be installed in a rack with a rear door and side panels for EMC compliance. The native HMC Ethernet ports must use shielded Ethernet cables.
Note: Government regulations, such as those prescribed by OSHA or European Community Directives, may govern noise level exposure in the workplace and may apply to you and your server installation. This IBM system is available with an optional acoustical door feature that can help reduce the noise emitted from this system. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room where you designate 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 you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

EMC conformance classification

This equipment is subject to Electromagnetic Compatibility (EMC) regulations and shall comply with the appropriate country EMC regulations before final delivery to the buyer or centers of distribution.

- US: FCC CFR, Title 47, Part 15, EMI Class A
- EEA, Turkey: EU Council Directive 2014/30/EU, EMI Class A
- Japan: VCCI Council, EMI Class A
- Korea: RRA, EMI Class A
- China (PRC): CPCS, EMI Class A
- Taiwan R.O.C.: BSMI CNS 13438, EMI Class A
- Australia\New Zealand: ACMA, EMI Class A
- Canada: ICES-003, EMI Class A
- Eurasian Economic Area (EAEU), EMI Class A
- Saudi Arabia: MoCI, EMI Class A
- Vietnam: MIC, EMI Class A
- Morocco EMC Order, EMC Class A

Homologation -- Telecom type approval

Homologation approval for specific countries has been initiated with the IBM Homologation and Type Approval (HT&A) organization in Nice, France.

The IBM Power System E950 server nodes or system control unit or PCIe Expansion units are not certified for connection 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 and for information on PCIe adapters that can be used in the system and which are certified.

Product safety/country testing/certification

- UL 60950-1:2007 Underwriters Laboratory
- CAN/CSA22.2 No. 60950-1-07
- EN60950-1:2006 European Norm
- IEC 60950-1 2nd Edition + all National Differences

Systems

- Product category: D.
- Weighted Teraflops (WT) is based on the number of floating point operations the processor can perform in a cycle.
  - The WT for a Power E950 0/8 core, typical 3.6 - 3.8 GHz, single-core processor is 0.08108 WT.
  - The WT for a Power E950 0/10 core, typical 3.4 - 3.8 GHz, single-core processor is 0.09497 WT.
  - The WT for a Power E950 0/11 core, typical 3.2 - 3.8 GHz, single-core processor is 0.09497 WT.
  - The WT for a Power E950 0/12 core, typical 3.15 - 3.8 GHz, single-core processor is 0.10535 WT.

Notes:

- Multiply 0.08108 WT by the number of typical 3.6 - 3.8 GHz processor cores to find the system WT number, or multiply 0.09497 WT by the number of typical 3.4 - 3.8 GHz processor cores to find the system WT number, or multiply 0.09497 WT by the number of typical 3.2 - 3.8 GHz processor cores to find the system WT number, or multiply 0.10535 WT by the number of typical 3.15 - 3,8 GHz processor cores to find the system WT number.

- For example, a 3.6 GHz 8-core system is 0.08108 x 8 = 0.64864 WT. The WT for 3.4 GHz 10-core system is 0.09497 x 10 = 0.94970 WT. The WT for 3.15 GHz 12-core system is 0.10535 x 12 = 1.2642 WT.

Homologation

The IBM Power System E950 server nodes or system control unit or PCIe Expansion units are not certified for direct connection 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 and for information on PCIe adapters that can be used in the system and which are certified.

Limitations

- The PCIe I/O Expansion Drawer (#EMX0) will be limited to a maximum of two for August 07, 2018, announcement.
- IBM Power System 9040-MR9 Rack does not support earthquake regions.

Hardware requirements

Not applicable.

Software requirements

If installing the AIX operating system LPAR with any I/O configuration (one of these):

- AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-02-1832, or later
- AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-02-1832, or later
- AIX Version 7.2 with the 7200-04 Technology Level, or later
- AIX Version 7.2 with the 7200-03 Technology Level, or later
- AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 6100-09-12-1838 or later (AIX 6.1 service extension required)
- AIX Version 7.2 with the 7200-01 Technology Level and Service Pack 7200-01-05-1845, or later
- AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 7100-04-07-1845, or later

If installing the AIX operating system Virtual I/O only LPAR (one of these):

- AIX Version 7.2 with the 7200-04 Technology Level, or later
- AIX Version 7.2 with the 7200-03 Technology Level, or later
- AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-01-1732, or later
- AIX Version 7.2 with the 7200-01 Technology Level and Service Pack 7200-01-01-1642, or later
- AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-01-1731, or later
- AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 7100-04-02-1614, or later
- AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 6100-09-07-1614, or later (AIX 6.1 service extension required)

See the IBM Prerequisite website for compatibility information for hardware features and the corresponding AIX and IBM i Technology Levels .

See the IBM Prerequisite website for compatibility information for hardware features and the corresponding AIX and IBM i Technology Levels.

If installing the Linux operating system (one of these):

- Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later
- Red Hat Enterprise Linux 8.1 for Power LE, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.1 for Power LE, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later (LTSS required)
- SUSE Linux Enterprise Server 12 Service Pack 5, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 5, or later
- SUSE Linux Enterprise Server 15 Service Pack 1, or later

Note: The above list applies to the installation of the Linux operating system LPAR in non-production SAP HANA implementations. Reference 'IBM Power System E950 (9040-MR9) for SAP HANA Production Use' Statement of Direction for production support.
If installing VIOS:

- VIOS 2.2.5.50 or later
- VIOS 2.2.6.31 or later
- VIOS 3.1.0.10 or later
- VIOS 3.1.1.10 or later

Java is supported on POWER9 servers. For best use of the performance capabilities and the most recent improvements of POWER9 technology, IBM recommends upgrading Java-based applications to Java 7, Java 8, or later, whenever possible. For those clients who want to run Java in AIX environments, see the AIX Download and service information website.

For Linux (including PowerLinux), see the Linux Download information website.

Recommendation: Clients are strongly encouraged to move to a more current supported version: Java 7, Java 7.1, Java 8, or later.

Back to top

Publications

IBM Power Systems hardware documentation provides you 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 POWER9 systems information at IBM Knowledge Center.

Product documentation is also available on DVD (SK5T-7087).

The following information is shipped with the 9040-MR9:

- Power Hardware Information DVD (SK5T-7087)
- 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 the IBM Support Portal website.

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. Go the IBM Systems Information Center, at IBM Knowledge Center.

To access the IBM Publications Center Portal, go to the IBM Publications Center website.

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, which can currently be downloaded.

National language support

Not applicable.

Back to top

Features

Features - No charge
Features - Chargeable
Feature availability matrix
Feature descriptions

Features - No charge

- NONE

Features - Chargeable

Special Features - Initial Orders

- Administrative
  - (#ECP0) -Cloud Private Solution
  - (#ESC7) -S&H
  - (#SVPC) -5000 Power to Cloud Reward points
- Languages
  - (#9300) -Language Group Specify - US English
  - (#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)
  - (#9716) -Language Group Specify - Korean
  - (#9718) -Language Group Specify - Turkish
  - (#9719) -Language Group Specify - Hungarian
  - (#9720) -Language Group Specify - Slovakian
  - (#9721) -Language Group Specify - Russian
  - (#9722) -Language Group Specify - Simplified Chinese (PRC)
  - (#9724) -Language Group Specify - Czech
  - (#9725) -Language Group Specify - Romanian
  - (#9726) -Language Group Specify - Croatian
  - (#9727) -Language Group Specify - Slovenian
  - (#9728) -Language Group Specify - Brazilian Portuguese
  - (#9729) -Language Group Specify - Thai
- Linecords
- Memory
- Miscellaneous
  - (#5000) -Software Preload Required
  - (#8143) -Linux Software Preinstall
  - (#8144) -Linux Software Preinstall (Business Partners)
  - (#9461) -Month Indicator
  - (#9462) -Day Indicator
  - (#9463) -Hour Indicator
  - (#9464) -Minute Indicator
  - (#9465) -Qty Indicator
  - (#9466) -Countable Member Indicator
  - (#EHKV) -SAP HANA TRACKING FEATURE
  - (#EHLU) -IBM Power Systems for SAS Viya (Linux)
  - (#EHLV) -IBM Power Systems for SAS 9.4 Grid (AIX)
- Processor
- Services
  - (#0456) -Customer Specified Placement
  - (#ERF1) -RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs
- Specify Codes
  - (#4650) -Rack Indicator-Not Factory Integrated
    One and only one rack indicator feature is required onall orders (#4650 to #4666).

- (#4651) -Rack Indicator, Rack #1
- (#4652) -Rack Indicator, Rack #2
- (#4653) -Rack Indicator, Rack #3
- (#4654) -Rack Indicator, Rack #4
- (#4655) -Rack Indicator, Rack #5
- (#4656) -Rack Indicator, Rack #6
- (#4657) -Rack Indicator, Rack #7
- (#4658) -Rack Indicator, Rack #8
- (#4659) -Rack Indicator, Rack #9
- (#4660) -Rack Indicator, Rack #10
- (#4661) -Rack Indicator, Rack #11
- (#4662) -Rack Indicator, Rack #12
- (#4663) -Rack Indicator, Rack #13
- (#4664) -Rack Indicator, Rack #14
- (#4665) -Rack Indicator, Rack #15
- (#4666) -Rack Indicator, Rack #16
- (#9169) -Order Routing Indicator-System Plant
- (#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
- (#9445) -Other Linux License Core Counter
- (#9446) -3rd Party Linux License Core Counter
- (#9447) -VIOS Core Counter
- (#9449) -Other License Core Counter
- (#9450) -Ubuntu Linux License Core Counter

- Standard Factory Services
  - (#4648) -Rack Integration Services: BP only
  - (#4649) -Rack Integration Services

Special Features - Plant and/or Field Installable

- Adapters
  - (#5729) -PCIe2 8Gb 4-port Fibre Channel Adapter
  - (#5735) -8 Gigabit PCI Express Dual Port Fibre Channel Adapter
  - (#5748) -POWER GXT145 PCI Express Graphics Accelerator
  - (#5785) -4 Port Async EIA-232 PCIe Adapter
  - (#5899) -PCIe2 4-port 1GbE Adapter
  - (#EC2N) -PCIe3 2-port 10GbE NIC&RoCE SR Adapter
  - (#EC2S) -PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
  - (#EC2U) -PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter
  - (#EC38) -PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
  - (#EC3B) -PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter
  - (#EC3M) -PCIe3 2-port 100GbE (NIC&RoCE) QSFP28 Adapter x16
  - (#EC46) -PCIe2 4-Port USB 3.0 Adapter
  - (#EC5B) -PCIe3 1.6 TB SSD NVMe Adapter
  - (#EC5D) -PCIe3 3.2 TB SSD NVMe Adapter
  - (#EC5F) -PCIe3 6.4 TB SSD NVMe Adapter
  - (#EC63) -PCIe4 1-port 100Gb EDR IB CAPI adapter
  - (#EC65) -PCIe4 2-port 100Gb EDR IB CAPI adapter
  - (#EC66) -PCIe4 2-port 100Gb ROCE EN adapter
  - (#EC6K) -PCIe2 2-Port USB 3.0 Adapter
  - (#EC7B) -PCIe4 1.6TB NVMe Flash Adapter x8 for AIX/Linux
  - (#EC7D) -PCIe4 3.2TB NVMe Flash Adapter x8 for AIX/Linux
  - (#EC7F) -PCIe4 6.4TB NVMe Flash Adapter x8 for AIX/Linux
  - (#EJ08) -PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer
  - (#EJ0J) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8
  - (#EJ0K) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8 for MR9
  - (#EJ0L) -PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
  - (#EJ10) -PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
  - (#EJ14) -PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
  - (#EJ1P) -PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter
  - (#EJ20) -PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer
  - (#EJ27) -PCIe Crypto Coprocessor No BSC 4765-001
  - (#EJ28) -PCIe Crypto Coprocessor Gen3 BSC 4765-001
  - (#EJ32) -PCIe3 Crypto Coprocessor no BSC 4767
  - (#EJ33) -PCIe3 Crypto Coprocessor BSC-Gen3 4767
  - (#EN0A) -PCIe3 16Gb 2-port Fibre Channel Adapter
  - (#EN0G) -PCIe2 8Gb 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
  - (#EN1A) -PCIe3 32Gb 2-port Fibre Channel Adapter
  - (#EN1C) -PCIe3 16Gb 4-port Fibre Channel Adapter
  - (#EN1G) -PCIe3 2-Port 16Gb Fibre Channel Adapter
  - (#EN2A) -PCIe3 16Gb 2-port Fibre Channel Adapter
- Administrative
  - (#0719) -Load Source Not in CEC
  - (#EHS2) -SSD Placement Indicator - #ESLS/#ELLS
  - (#ESC0) -S&H - No Charge
- 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
  - (#1111) -3m, Blue Cat5e Cable
  - (#1112) -10m, Blue Cat5e Cable
  - (#1113) -25m, Blue Cat5e Cable
  - (#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
  - (#3684) -SAS Cable (AE) Adapter to Enclosure, single controller/ single path 3M
  - (#3685) -SAS Cable (AE) Adapter to Enclosure, single controller/ single path 6M

- (#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
- (#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)
- (#4256) -Extender Cable - USB Keyboards, 1.8M
- (#4276) -VGA to DVI Connection Converter
- (#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
- (#EB46) -10Gb Optical Transceiver SFP+ SR
- (#EB47) -25Gb Optical Transceiver SFP28
- (#EB4J) -0.5m SFP28/25GbE copper Cable
- (#EB4K) -1.0m SFP28/25GbE copper Cable
- (#EB4L) -1.5m SFP28/25GbE copper Cable
- (#EB4M) -2.0m SFP28/25GbE copper Cable
- (#EB4P) -2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE
- (#EB50) -0.5m 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
- (#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)
- (#ECB0) -0.6m (2.0-ft), Blue CAT5 Ethernet Cable
- (#ECB2) -1.5m (4.9-ft), Blue CAT5 Ethernet Cable
- (#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
- (#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
- (#ECCF) -System Port Converter Cable for UPS
- (#ECCS) -3M Copper CXP Cable Pair for PCIe3 Expansion Drawer
- (#ECCX) -3M Active Optical Cable Pair for PCIe3 Expansion Drawer
- (#ECCY) -10M Active Optical 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), 10Gb E'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

- Disk
  - (#1818) -Quantity 150 of #1964
  - (#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)
  - (#EQDP) -Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/ LINUX)
  - (#EQEV) -Quantity 150 of #ESEV (600GB 10k SFF-2)
  - (#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)
  - (#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)
  - (#EQD3) -Quantity 150 of #ESD3 (1.2TB 10k SFF-2)
  - (#ESD5) -600GB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESDB) -300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)
  - (#ESD3) -1.2TB 10K RPM SAS SFF-2 Disk Drive (AIX/Linux)
  - (#ESDP) -600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block (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)
- Global Resource Activation
  - (#EP20) -Power Enterprise Pools 2.0 Enablement
- Linecords
  - (#4558) -Power Cord To PDU/UPS, (100-240V/16A)
  - (#6458) -Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)
  - (#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

- (#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)
- (#EQ77) -Qty 150 of #6577

- Manufacturing Instruction
  - (#0373) -UPS Factory Integration Specify
  - (#0374) -HMC Factory Integration Specify
  - (#0375) -Display Factory Integration Specify
  - (#0376) -Reserve Rack Space for UPS
  - (#0377) -Reserve Rack Space for HMC
  - (#0378) -Reserve Rack Space for Display
  - (#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)
  - (#EJRK) -Specify Mode-2 & (1 or 2)EJ0K 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
  - (#EJRV) -Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24S (#5887/ EL1S)
  - (#EJV1) -Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP12SX #ESLL/ELLL
  - (#EJV2) -Specify Mode-1 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
  - (#EJV3) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
  - (#EJV4) -Specify Mode-2 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
  - (#EJV5) -Specify Mode-4 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
  - (#EJV6) -Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
  - (#EJV7) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
  - (#EJVA) -Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP12SX #ESLL/ELLL
  - (#EJVB) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
  - (#EJVC) -Specify Mode-4 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
  - (#EJVD) -Specify Mode-4 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
  - (#EJVE) -Specify Mode-4 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
  - (#EJVF) -Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ ELLL
  - (#EJVP) -Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ ELLL

- (#EJVV)-Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL
- (#EJVW) -Specify Mode-2 &(1or2)EJ0K &(2)YO12 for EXP12SX #ESLL/ELLL
- (#EJW1) -Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP24SX #ESLS/ELLS
- (#EJW2) -Specify Mode-1 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW3) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
- (#EJW4) -Specify Mode-2 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
- (#EJW5) -Specify Mode-4 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
- (#EJW6) -Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW7) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
- (#EJWA) -Specify Mode-2 1(1)EJ0J/EJ0M/EJ0K/EL3B/EL59 1(1)YO12 for EXP24SX #ESLS/ELLS
- (#EJWB) -Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
- (#EJWC) -Specify Mode-4 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
- (#EJWD) -Specify Mode-4 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
- (#EJWE) -Specify Mode-4 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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
- (#EJWW) -Specify Mode-2 &(1or2)EJ0K &(2)YO12G for EXP24SX #ESLS/ELLS
- (#EJWV)-Specify Mode-1 & (2)EJ14 & (2)YO12G for EXP24SX #ESLS/ELLS

- Media Devices
  - (#EUA5) -Standalone USB DVD drive w/cable
- Memory
  - (#ELNP) -Power IFL Memory Activation
  - (#EM03) -Memory Riser Card
  - (#EM6A) -8 GB DDR4 Memory
  - (#EM6B) -16 GB DDR4 Memory
  - (#EM6C) -32 GB DDR4 Memory
  - (#EM6D) -64 GB DDR4 Memory
  - (#EM6E) -128 GB DDR4 Memory
  - (#EM81) -Active Memory Mirroring
  - (#EM9B) -64 GB DDR4 Memory Dimm
  - (#EM9C) -128 GB DDR4 Memory Dimm
  - (#EM9U) -90 Days Elastic CoD Memory Enablement
  - (#EMAM) -Power Active Memory Expansion
  - (#EMAP) -1GB Memory Activation
  - (#EMAQ) -Quantity of 100 1GB Memory Activations
  - (#EMBE) -512 GB Linux Memory Activations for MR9
  - (#EMEF) -VRM DDR4 Memory for MR9
  - (#EMJE) -8 GB-Day Billing for Elastic CoD Memory
  - (#EMJF) -800 GB-Day Billing for Elastic CoD Memory
  - (#EPQ8) -1 GB Base Memory Activation (Pools 2.0)
  - (#EPQ9) -100 GB Base Memory Activation (Pools 2.0)
  - (#EPQA) -256 GB Base Memory Activation (Pools 2.0)
  - (#EPQK) -1GB Base Memory activation (Pools 2.0) from Static
  - (#EPQL) -100GB Base Memory activation (Pools 2.0) from Static
  - (#EPQM) -512GB Base Memory activation (Pools 2.0) convert from Linux only
  - (#EPQN) -256GB Base Memory Activation for POOLS 2.0 - Linux only
- Miscellaneous
  - (#1140) -Custom Service Specify, Rochester Minn, USA
  - (#2146) -Primary OS - AIX
  - (#2147) -Primary OS - Linux
  - (#ECSF) -Custom Service Specify, Montpellier, France
  - (#ECSJ) -NeuCloud Indicator/Specify
    For China only

- (#ECSM) -Custom Service Specify, Mexico
- (#ECSP) -Custom Service Specify, Poughkeepsie, USA
- (#EJ0B) -Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers
- (#EJ0C) -Storage Backplane with HI Performance plus 2x24-Port
- (#EJBB) -Storage Backplane Base DASD 8 SAS 2.5" HDD/SDD Controllers
- (#EJSB) -Storage Backplane Split DASD 8 SAS 2.5" HDD/SDD Controllers
- (#ELBJ) -PowerVM for Linux indicator

- Pointing Device
  - (#8845) -USB Mouse
- Power
  - (#EB3M) -Power Supply - 2000W for Server (200-240 VAC)
  - (#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
  - (#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
  - (#ESLA) -Specify AC Power Supply for EXP12SX/EXP24SX Storage Enclosure
- Processor
  - (#ELBG) -1-core Linux Processor Activation for #EPWR
  - (#ELBH) -1-core Linux Processor Activation for #EPWT
  - (#ELBP) -1-core Linux Processor Activation for #EPWS
  - (#ELBR) -1-core Linux Processor Activation for #EPWY
  - (#EP9T) -90 Days Elastic CoD Processor Core Enablement
  - (#EPN0) -1 Proc-day Elastic billing for #EPWR/EPWK
  - (#EPN1) -100 Proc-day Elastic COD billing #EPWR/EPWK AIX
  - (#EPN2) -100 Proc-mins Utility COD billing #EPWR/EPWK
  - (#EPN3) -1-core Processor Activation for #EPWY
  - (#EPN5) -1 Proc-day Elastic billing for #EPWS/EPWL
  - (#EPN6) -100 Proc-day Elastic COD billing #EPWS/EPWL AIX
  - (#EPN7) -100 Proc-mins Utility COD billing #EPWS/EPWL
  - (#EPN8) -1 Proc-day Elastic billing for #EPWY/EPWZ
  - (#EPN9) -100 Proc-day Elastic COD billing #EPWY/EPWZ AIX
  - (#EPNK) -1 Proc-day Elastic billing for #EPWT/EPWM
  - (#EPNL) -100 Proc-day Elastic COD billing #EPWT/EPWM AIX
  - (#EPNM) -100 Proc-mins Utility COD billing #EPWT/EPWM
  - (#EPNN) -100 Proc-mins Utility COD billing #EPWY/EPWZ
  - (#EPQ0) -1 core Base Processor Activation (Pools 2.0) for EPWR
  - (#EPQ1) -1 core Base Processor Activation (Pools 2.0) for EPWS
  - (#EPQ2) -1 core Base Processor Activation (Pools 2.0) for EPWT
  - (#EPQ3) -1 core Base Processor Activation (Pools 2.0) for EPWY
  - (#EPQ4) -1 core Base Linux Processor Activation (Pools 2.0) for EPWR
  - (#EPQ5) -1 core Base Linux Processor Activation (Pools 2.0) for EPWS
  - (#EPQ6) -1 core Base Linux Processor Activation (Pools 2.0) for EPWT
  - (#EPQ7) -1 core Base Linux Processor Activation (Pools 2.0) for EPWY
  - (#EPQB) -1 core Base Proc Act (Pools 2.0) for #EPWR (from Static)
  - (#EPQC) -1 core Base Proc Act (Pools 2.0) for #EPWS (from Static)
  - (#EPQD) -1 core Base Proc Act (Pools 2.0) for #EPWT (from Static)
  - (#EPQE) -1 core Base Proc Act (Pools 2.0) for #EPWY (from Static)
  - (#EPQF) -1 core Base Proc Act (Pools 2.0) for #EPWR Linux (from Static)
  - (#EPQG) -1 core Base Proc Act (Pools 2.0) for #EPWS Linux (from Static)
  - (#EPQH) -1 core Base Proc Act (Pools 2.0) for #EPWT Linux (from Static)
  - (#EPQJ) -1 core Base Proc Act (Pools 2.0) for #EPWY Linux (from Static)
  - (#EPWR) -8-core Typical 3.6 to 3.8 GHZ (max) processor
  - (#EPWS) -10-core Typical 3.4 to 3.8 GHZ (max) processor
  - (#EPWT) -12-core Typical 3.15 to 3.8 GHZ (max) processor
  - (#EPWV) -1-core Processor Activation for #EPWR
  - (#EPWW) -1-core Processor Activation for #EPWS
  - (#EPWX) -1W Processor activation for #EPWT
  - (#EPWY) -11-core Typical 3.2 to 3.8 GHZ (max) processor
- 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
- (#EB2Z) -Lift Tool
- (#EB3Z) -Lift tool based on GenieLift GL-8 (standard)
- (#EB4Z) -Service wedge shelf tool kit for EB3Z
- (#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)
- (#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
- (#EMXH) -PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
- (#EPTH) -Horizontal PDU Mounting Hardware
- (#ER05) -42U Slim Rack
- (#ERG0) -Rear rack extension
- (#ERG7) -Optional Origami Front Door for 2.0m Rack
- (#ESLL) -EXP12SX SAS Storage Enclosure
- (#ESLS) -EXP24SX SAS Storage Enclosure

- Services
  - (#0010) -One CSC Billing Unit
  - (#0011) -Ten CSC Billing Units
  - (#B0VP) -SP Machine Setup Support for Power
  - (#EUC6) -Core Use HW Feature
  - (#EUC7) -Core Use HW Feature 10X
- Solid State Drive
  - (#EC5J) -Mainstream 800 GB SSD NVMe U.2 module
  - (#EC5K) -Mainstream 1.6 TB SSD NVMe U.2 module
  - (#EC5L) -Mainstream 3.2 TB SSD NVMe U.2 module
  - (#EQ0Q) -Quantity 150 of #ES0Q 387GB SFF-2 4k SSD (AIX/Linux)
  - (#EQ0S) -Quantity 150 of #ES0S 775GB SFF-2 4k SSD (AIX/Linux)
  - (#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
  - (#EQ96) -Quantity 150 of ES96 1.86TB SFF-2 SSD 4k
  - (#EQE7) -Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k
  - (#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
  - (#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
  - (#ERJ6) -Quantity 150 of ESJ6 7.45TB SAS 4k
  - (#ERNA) -Quantity 150 of ESNA 775GB SSD 4k
  - (#ERNE) -Quantity 150 of ESNE 1.55TB SSD 4k
  - (#ERHJ) -Quantity 150 of #ESHJ 931 GB SSD 4k SFF-2
  - (#ERHL) -Quantity 150 of #ESHL 1.86 TB SSD 4k SFF-2
  - (#ERHN) -Quantity 150 of #ESHN 7.45 TB SSD 4k SFF-2
  - (#ERM8) -Quantity 150 of #ESM8 3.72 TB SSD 4k SFF-2
  - (#ES0Q) -387GB SFF-2 4K SSD for AIX/Linux
  - (#ES0S) -775GB SFF-2 4k SSD for AIX/Linux

- (#ES0S) -775GB SFF-2 4k SSD 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
- (#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
- (#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
- (#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
- (#ESHN) -7.45 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESHS) -931 GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESHU) -1.86 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESHW) -7.45 TB Mainstream 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
- (#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
- (#ESJ6) -7.45TB 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
- (#ESJE) -7.45TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJJ) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJL) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJN) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJQ) -7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJS) -931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJU) -1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJW) -3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
- (#ESJY) -7.44TB 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
  - (#0728) -EXP24S SFF Gen2 Load Source Specify (#5887 or #EL1S)
  - (#0837) -SAN Load Source Specify
  - (#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
  - (#EPA0) -Deactivation of LPM (Live Partition Mobility)
  - (#EPVV) -PowerVM - Enterprise Edition

Feature availability matrix

The following feature availability matrix for MT 9040 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.

```
        |M| A = AVAILABLE  S = SUPPORTED
        |R| N = NOT SUPPORTED, MUST BE REMOVED
        |9|
        | |
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
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
```

```
0373    |A| UPS Factory Integration Specify
0374    |A| HMC Factory Integration Specify
0375    |A| Display Factory Integration Specify
0376    |A| Reserve Rack Space for UPS
0377    |A| Reserve Rack Space for HMC
0378    |A| Reserve Rack Space for Display
0456    |A| Customer Specified Placement
0551    |A| 19 inch, 1.8 meter high rack
0553    |A| 19 inch, 2.0 meter high rack
0599    |A| Rack Filler Panel Kit
0719    |A| Load Source Not in CEC
0728    |S| EXP24S SFF Gen2 Load Source Specify (#5887 or #EL1S)
0837    |A| SAN Load Source Specify
```

```
1025    |S| Modem Cable - US/Canada and General Use
1107    |A| USB 500 GB Removable Disk Drive
1111    |A| 3m, Blue Cat5e Cable
1112    |A| 10m, Blue Cat5e Cable
1113    |A| 25m, Blue Cat5e Cable
1140    |A| Custom Service Specify, Rochester Minn, USA
1818    |A| Quantity 150 of #1964
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
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
3632 |S| Widescreen LCD Monitor
3684 |A| SAS Cable (AE) Adapter to Enclosure, single controller/
| |single path 3M
3685 |A| SAS Cable (AE) Adapter to Enclosure, single controller/
| |single path 6M
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
4558 |A| Power Cord To PDU/UPS, (100-240V/16A)
4648 |A| Rack Integration Services: BP only
4649 |A| Rack Integration Services
One and only one rack indicator feature is required onall orders (#4650 to #4666).
4650 |A| Rack Indicator- Not Factory Integrated
4651 |A| Rack Indicator, Rack #1
4652 |A| Rack Indicator, Rack #2
4653 |A| Rack Indicator, Rack #3
4654 |A| Rack Indicator, Rack #4
4655 |A| Rack Indicator, Rack #5
4656 |A| Rack Indicator, Rack #6
4657 |A| Rack Indicator, Rack #7
4658 |A| Rack Indicator, Rack #8
4659 |A| Rack Indicator, Rack #9
4660 |A| Rack Indicator, Rack #10
4661 |A| Rack Indicator, Rack #11
4662 |A| Rack Indicator, Rack #12
4663 |A| Rack Indicator, Rack #13
4664 |A| Rack Indicator, Rack #14
4665 |A| Rack Indicator, Rack #15
4666 |A| Rack Indicator, Rack #16
5000 |A| Software Preload Required
5729 |S| PCIe2 8Gb 4-port Fibre Channel Adapter
5735 |S| 8 Gigabit PCI Express Dual Port Fibre Channel Adapter
5748 |A| POWER GXT145 PCI Express Graphics Accelerator
5785 |A| 4 Port Async EIA-232 PCIe Adapter
5887 |S| EXP24S SFF Gen2-bay Drawer
5899 |A| PCIe2 4-port 1GbE 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| Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)
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
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)
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)
7118 |A| Environmental Monitoring Probe

```
7802    |A| Ethernet Cable, 15m, Hardware Management Console to System
        | |Unit
8143    |A| Linux Software Preinstall
8144    |A| Linux Software Preinstall (Business Partners)
8845    |S| USB Mouse
9169    |A| Order Routing Indicator- System Plant
9300    |A| Language Group Specify - US English
9440    |A| New AIX License Core Counter
9442    |A| New Red Hat License Core Counter
9443    |A| New SUSE License Core Counter
9444    |A| Other AIX License Core Counter
9445    |A| Other Linux License Core Counter
9446    |A| 3rd Party Linux License Core Counter
9447    |A| VIOS Core Counter
9449    |A| Other License Core Counter
9450    |A| Ubuntu Linux License Core Counter
9461    |A| Month Indicator
9462    |A| Day Indicator
9463    |A| Hour Indicator
9464    |A| Minute Indicator
9465    |A| Qty Indicator
9466    |A| Countable Member Indicator
9700    |A| Language Group Specify - Dutch
9703    |A| Language Group Specify - French
9704    |A| Language Group Specify - German
9705    |A| Language Group Specify - Polish
9706    |A| Language Group Specify - Norwegian
9707    |A| Language Group Specify - Portuguese
9708    |A| Language Group Specify - Spanish
9711    |A| Language Group Specify - Italian
9712    |A| Language Group Specify - Canadian French
9714    |A| Language Group Specify - Japanese
9715    |A| Language Group Specify - Traditional Chinese (Taiwan)
9716    |A| Language Group Specify - Korean
9718    |A| Language Group Specify - Turkish
9719    |A| Language Group Specify - Hungarian
9720    |A| Language Group Specify - Slovakian
9721    |A| Language Group Specify - Russian
9722    |A| Language Group Specify - Simplified Chinese (PRC)
9724    |A| Language Group Specify - Czech
9725    |A| Language Group Specify - Romanian
9726    |A| Language Group Specify - Croatian
9727    |A| Language Group Specify - Slovenian
9728    |A| Language Group Specify - Brazilian Portuguese
9729    |A| Language Group Specify - Thai

          B0VP    |A| SP Machine Setup Support for Power



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
EB2Z    |A| Lift Tool
EB3M    |A| Power Supply - 2000W for Server (200-240 VAC)
EB3Z    |A| Lift tool based on GenieLift GL-8 (standard)
EB46    |A| 10Gb Optical Transceiver SFP+ SR
EB47    |A| 25Gb Optical Transceiver SFP28
EB4J    |A| 0.5m SFP28/25GbE copper Cable
EB4K    |A| 1.0m SFP28/25GbE copper Cable
EB4L    |S| 1.5m SFP28/25GbE copper Cable
EB4M    |A| 2.0m SFP28/25GbE copper Cable
EB4P    |A| 2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE
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
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)
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
EC2N |S| PCIe3 2-port 10GbE NIC&RoCE SR Adapter
EC2S |A| PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
EC2U |A| PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter
EC38 |S| PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter
EC3B |S| PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter
EC3M |S| PCIe3 2-port 100GbE (NIC&RoCE) QSFP28 Adapter x16
EC46 |S| PCIe2 4-Port USB 3.0 Adapter
EC5J |A| Mainstream 800 GB SSD NVMe U.2 module
EC5K |A| Mainstream 1.6 TB SSD NVMe U.2 module
EC5L |A| Mainstream 3.2 TB SSD NVMe U.2 module
EC5B |A| PCIe3 1.6 TB SSD NVMe Adapter
EC5D |A| PCIe3 3.2 TB SSD NVMe Adapter
EC5F |A| PCIe3 6.4 TB SSD NVMe Adapter
EC63 |A| PCIe4 1-port 100Gb EDR IB CAPI adapter
EC65 |S| PCIe4 2-port 100Gb EDR IB CAPI adapter
EC66 |A| PCIe4 2-port 100Gb ROCE EN adapter
EC6K |A| PCIe2 2-Port USB 3.0 Adapter
EC7B |A| PCIe4 1.6TB NVMe Flash Adapter x8 for AIX/Linux
EC7D |A| PCIe4 3.2TB NVMe Flash Adapter x8 for AIX/Linux
EC7F |A| PCIe4 6.4TB NVMe Flash Adapter x8 for AIX/Linux
ECB0 |A| 0.6m (2.0-ft), Blue CAT5 Ethernet Cable
ECB2 |A| 1.5m (4.9-ft), Blue CAT5 Ethernet Cable
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
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 |S| SAS AA Cable 0.6m - HD Narrow 6Gb Adapter to Adapter
ECC2 |S| SAS AA Cable 1.5m - HD Narrow 6Gb Adapter to Adapter
ECC3 |S| 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
ECCS |A| 3M Copper CXP Cable Pair for PCIe3 Expansion Drawer
ECCX |A| 3M Active Optical Cable Pair for PCIe3 Expansion Drawer
ECCY |A| 10M Active Optical 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)
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 |A| 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)
ECSF |A| Custom Service Specify, Montpellier, France
For China only
ECSJ |S| NeuCloud Indicator/Specify
ECSM |A| Custom Service Specify, Mexico
ECSP |A| Custom Service Specify, Poughkeepsie, USA
ECW0 |A| Optical Wrap Plug

EHKV |A| SAP HANA TRACKING FEATURE
EHLU |A| IBM Power Systems for SAS Viya (Linux)
EHLV |A| IBM Power Systems for SAS 9.4 Grid (AIX)
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
EJ08 |S| PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer
EJ0B |A| Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers
EJ0J |S| PCIe3 RAID SAS Adapter Quad-port 6Gb x8

EJ0K	A	PCIe3 RAID SAS Adapter Quad-port 6Gb x8 for MR9
EJ0L	S	PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
EJ0C	A	Storage Backplane with HI Performance plus 2x24-Port
EJ10	A	PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
EJ14	A	PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
EJ1P	S	PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter
EJ20	A	PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer
EJ27	S	PCIe Crypto Coprocessor No BSC 4765-001
EJ28	S	PCIe Crypto Coprocessor Gen3 BSC 4765-001
EJ32	A	PCIe3 Crypto Coprocessor no BSC 4767
EJ33	S	PCIe3 Crypto Coprocessor BSC-Gen3 4767
EJBB	A	Storage Backplane Base DASD 8 SAS 2.5" HDD/SDD Controllers
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)
EJRK	S	Specify Mode-2 & (1 or 2)EJ0K for EXP24S (#5887/EL1S)
EJRL	A	Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter
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
EJRV	S	Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24S (#5887/EL1S)
EJSB	A	Storage Backplane Split DASD 8 SAS 2.5" HDD/SDD Controllers
EJV1	A	Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP12SX #ESLL/ELLL
EJV2	A	Specify Mode-1 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
EJV3	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
EJV4	A	Specify Mode-2 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
EJV5	A	Specify Mode-4 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
EJV6	A	Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
EJV7	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP12SX #ESLL/ELLL
EJVA	A	Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP12SX #ESLL/ELLL
EJVB	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
EJVC	A	Specify Mode-4 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
EJVD	A	Specify Mode-4 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP12SX #ESLL/ELLL
EJVE	A	Specify Mode-4 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP12SX #ESLL/ELLL
EJVF	A	Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL
EJVP	A	Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ELLL
EJVW	A	Specify Mode-2 &(1or2)EJ0K &(2)YO12 for EXP12SX #ESLL/ELLL
EJVV	A	Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL
EJWV	A	Specify Mode-1 & (2)EJ14 & (2)YO12G for EXP24SX #ESLS/ELLS
EJW1	A	Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP24SX #ESLS/ELLS
EJW2	A	Specify Mode-1 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
EJW3	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
EJW4	A	Specify Mode-2 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
EJW5	A	Specify Mode-4 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)X12 for EXP24SX #ESLS/ELLS
EJW6	A	Specify Mode-2 1(1)EJ0J/EK0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
EJW7	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(2)YO12 for EXP24SX #ESLS/ELLS
EJWA	A	Specify Mode-2 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)YO12 for EXP24SX #ESLS/ELLS
EJWB	A	Specify Mode-2 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
EJWC	A	Specify Mode-4 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
EJWD	A	Specify Mode-4 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(1)X12 for EXP24SX #ESLS/ELLS
EJWE	A	Specify Mode-4 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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
EJWW |A| Specify Mode-2 &(1or2)EJ0K &(2)YO12G for EXP24SX #ESLS/ELLS

ELBG |A| 1-core Linux Processor Activation for #EPWR
ELBH |A| 1-core Linux Processor Activation for #EPWT
ELBJ |A| PowerVM for Linux indicator
ELBP |A| 1-core Linux Processor Activation for #EPWS
ELBR |A| 1-core Linux Processor Activation for #EPWY
ELC0 |A| PDU Access Cord 0.38m
ELC5 |A| Power Cable - Drawer to IBM PDU (250V/10A)
ELNP |S| Power IFL Memory Activation
EM03 |A| Memory Riser Card
EM6A |S| 8 GB DDR4 Memory
EM6B |A| 16 GB DDR4 Memory
EM6C |A| 32 GB DDR4 Memory
EM6D |A| 64 GB DDR4 Memory
EM6E |A| 128 GB DDR4 Memory
EM81 |A| Active Memory Mirroring
EM9B |A| 64 GB DDR4 Memory Dimm
EM9C |A| 128 GB DDR4 Memory Dimm
EM9U |S| 90 Days Elastic CoD Memory Enablement
EMAM |A| Power Active Memory Expansion

EMAP |A| 1GB Memory Activation
EMAQ |A| Quantity of 100 1GB Memory Activations
EMBE |A| 512 GB Linux Memory Activations for MR9
EMEF |A| VRM DDR4 Memory for MR9
EMJE |S| 8 GB-Day Billing for Elastic CoD Memory
EMJF |S| 800 GB-Day Billing for Elastic CoD Memory
EMX0 |A| PCIe Gen3 I/O Expansion Drawer
EMXA |A| AC 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
EMXH |A| PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
EN01 |A| 1m (3.3-ft), 10Gb E'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
EN0G |S| PCIe2 8Gb 2-Port Fibre Channel Adapter
EN0H |S| PCIe3 4-port (10Gb FCoE & 1GbE) SR&RJ45
EN0K |S| PCIe3 4-port (10Gb FCoE & 1GbE) SFP+Copper&RJ45
EN0M |S| PCIe3 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter
EN0S |A| PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter
EN0U |A| PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
EN0W |A| PCIe2 2-port 10/1GbE BaseT RJ45 Adapter
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
EN1A |A| PCIe3 32Gb 2-port Fibre Channel Adapter
EN1C |A| PCIe3 16Gb 4-port Fibre Channel Adapter
EN1G |A| PCIe3 2-Port 16Gb Fibre Channel Adapter
EN2A |A| PCIe3 16Gb 2-port Fibre Channel Adapter

EP2X |A| Lab Services Private Cloud Capacity Assessment
EP9T |S| 90 Days Elastic CoD Processor Core Enablement
EPA0 |A| Deactivation of LPM (Live Partition Mobility)
EPN0 |S| 1 Proc-day Elastic billing for #EPWR/EPWK
EPN1 |S| 100 Proc-day Elastic COD billing #EPWR/EPWK AIX
EPN2 |A| 100 Proc-mins Utility COD billing #EPWR/EPWK
EPN3 |A| 1-core Processor Activation for #EPWY
EPN5 |S| 1 Proc-day Elastic billing for #EPWS/EPWL
EPN6 |S| 100 Proc-day Elastic COD billing #EPWS/EPWL AIX
EPN7 |A| 100 Proc-mins Utility COD billing #EPWS/EPWL
EPN8 |S| 1 Proc-day Elastic billing for #EPWY/EPWZ
EPN9 |S| 100 Proc-day Elastic COD billing #EPWY/EPWZ AIX
EPNK |S| 1 Proc-day Elastic billing for #EPWT/EPWM
EPNL |S| 100 Proc-day Elastic COD billing #EPWT/EPWM AIX
EPNM |A| 100 Proc-mins Utility COD billing #EPWT/EPWM
EPNN |A| 100 Proc-mins Utility COD billing #EPWY/EPWZ
EPQ0 |A| 1 core Base Processor Activation (Pools 2.0) for EPWR
EPQ1 |A| 1 core Base Processor Activation (Pools 2.0) for EPWS
EPQ2 |A| 1 core Base Processor Activation (Pools 2.0) for EPWT
EPQ3 |A| 1 core Base Processor Activation (Pools 2.0) for EPWY

EPQ4	A	1 core Base Linux Processor Activation (Pools 2.0) for EPWR
EPQ5	A	1 core Base Linux Processor Activation (Pools 2.0) for EPWS
EPQ6	A	1 core Base Linux Processor Activation (Pools 2.0) for EPWT
EPQ7	A	1 core Base Linux Processor Activation (Pools 2.0) for EPWY
EPQ8	A	1 GB Base Memory Activation (Pools 2.0)
EPQ9	A	100 GB Base Memory Activation (Pools 2.0)
EPQA	A	256 GB Base Memory Activation (Pools 2.0)
EPQB	A	1 core Base Proc Act (Pools 2.0) for #EPWR (from Static)
EPQC	A	1 core Base Proc Act (Pools 2.0) for #EPWS (from Static)
EPQD	A	1 core Base Proc Act (Pools 2.0) for #EPWT (from Static)
EPQE	A	1 core Base Proc Act (Pools 2.0) for #EPWY (from Static)
EPQF	A	1 core Base Proc Act (Pools 2.0) for #EPWR Linux (from Static)
EPQG	A	1 core Base Proc Act (Pools 2.0) for #EPWS Linux (from Static)
EPQH	A	1 core Base Proc Act (Pools 2.0) for #EPWT Linux (from Static)
EPQJ	A	1 core Base Proc Act (Pools 2.0) for #EPWY Linux (from Static)
EPQK	A	1GB Base Memory activation (Pools 2.0) from Static
EPQL	A	100GB Base Memory activation (Pools 2.0) from Static
EPQM	A	512GB Base Memory activation (Pools 2.0) convert from Linux only
EPQN	A	256GB Base Memory Activation for POOLS 2.0 - Linux only
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
EPVV	A	PowerVM - Enterprise Edition
EPWR	A	8-core Typical 3.6 to 3.8 GHZ (max) processor
EPWS	A	10-core Typical 3.4 to 3.8 GHZ (max) processor
EPWT	A	12-core Typical 3.15 to 3.8 GHZ (max) processor
EPWV	A	1-core Processor Activation for #EPWR
EPWW	A	1-core Processor Activation for #EPWS
EPWX	A	1W Processor activation for #EPWT
EPWY	A	11-core Typical 3.2 to 3.8 GHZ (max) processor
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)
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
EQ77	A	Qty 150 of #6577
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
EQ96	S	Quantity 150 of ES96 1.86TB SFF-2 SSD 4k
EQE7	S	Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k
EQEV	A	Quantity 150 of #ESEV (600GB 10k SFF-2)
EQEZ	S	Quantity 150 of #ESEZ (300GB SFF-2)
EQF3	A	Quantity 150 of #ESF3 (1.2TB 10k SFF-2)
EQFP	S	Quantity 150 of #ESFP (600GB SFF-2)
EQFT	A	Quantity 150 of #ESFT (1.8TB 10k SFF-2)
EQD3	S	Quantity 150 of #ESD3 (1.2TB 10k SFF-2)
EQDP	S	Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/LINUX)
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
ER94	S	Quantity 150 of ES94 387GB SAS 4k
ERF1	A	RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs
ERG0	A	Rear rack extension
ERG7	A	Optional Origami Front Door for 2.0m Rack
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
ERHN	S	Quantity 150 of #ESHN 7.45 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
ERJ6	A	Quantity 150 of ESJ6 7.45TB 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
ES0Q	S	387GB SFF-2 4K SSD for AIX/Linux
ES0S	S	775GB SFF-2 4k SSD 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
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
ESC7    |A| S&H
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)
ESDB    |A| 300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)
ESDP    |S| 600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block (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    |A| 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
ESHN    |S| 7.45 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
ESHW    |S| 7.45 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
ESJ6    |A| 7.45TB 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
ESJE    |A| 7.45TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJJ    |A| 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJL    |A| 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJN    |A| 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJQ    |A| 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJS    |A| 931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJU    |A| 1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJW    |A| 3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux
ESJY    |A| 7.44TB 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/
        | |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    |A| 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




EU2T    |A| 2TB Removable Disk Drive Cartridge (RDX)




EUA5    |A| Standalone USB DVD drive w/cable
EUC6    |A| Core Use HW Feature
EUC7    |A| Core Use HW Feature 10X
SVPC    |A| 5000 Power to Cloud Reward points
```

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 9040 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: 9999 (Initial order maximum: 250)
- 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: 960 (Initial order maximum: 250)
- OS level required: n/a
- 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: 960 (Initial order maximum: 250)
- OS level required: n/a
- 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: 480 (Initial order maximum: 250)
- OS level required: n/a
- 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: 480 (Initial order maximum: 250)
- OS level required: n/a
- 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: 480 (Initial order maximum: 250)
- OS level required: n/a
- 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

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

(#0373) - UPS Factory Integration Specify

Used in manufacturing to ensure that a UPS ordered from IBM under a separate machine type/model, is associated with the system order, and is shipped concurrently.

- Attributes provided: N/A
- Attributes required: Ordered machine type-model UPS.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0374) - HMC Factory Integration Specify

Used in manufacturing to ensure that an HMC ordered from IBM under a separate machine type/model is associated with the system order and is shipped concurrently.

- Attributes provided: N/A
- Attributes required: Ordered machine type-model HMC.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0375) - Display Factory Integration Specify

Used in manufacturing to ensure that a display ordered from IBM under a separate machine type/model, is associated with the system order, and is shipped concurrently.

- Attributes provided: N/A
- Attributes required: Ordered machine type-model display.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0376) - Reserve Rack Space for UPS

Used in manufacturing to reserve 1 EIA of rack space in the bottom of the rack for later client installation of a UPS.

- Attributes provided: 1 EIA rack space reserved.
- Attributes required: Ordered rack feature.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0377) - Reserve Rack Space for HMC

Used in manufacturing to reserve 1 EIA of rack space in the middle of the rack for later client installation of a rack-mounted HMC.

- Attributes provided: 1 EIA rack space reserved.
- Attributes required: Ordered rack feature.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0378) - Reserve Rack Space for Display

Used in manufacturing to reserve 1 EIA of rack space in the middle of the rack for later client installation of an HMC rack-mounted display such as the 7316.

- Attributes provided: 1 EIA rack space reserved.
- Attributes required: Ordered rack feature.
- Minimum required: 0
- Maximum allowed: 42 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: Available only when ordered with 19 inch feature code rack on an MES order. Max. is 36 with rack feature 0551.

(#0456) - Customer Specified Placement

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 Web site 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 Web site. (US Business Partners and Distributors can bypass this step.)
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#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 feature #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 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: n/a
- 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 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 horizontal 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: n/a
- Initial Order/MES/Both/Supported: MES
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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) - EXP24S SFF Gen2 Load Source Specify (#5887 or #EL1S)

(No longer available as of December 31, 2020)

Indicates 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: MES
- CSU: Yes
- Return parts MES: Does not apply

(#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: 480 (Initial order maximum: 0)
- OS level required: n/a
- 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:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - IBM i - not supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1111) - 3m, Blue Cat5e Cable

This 3m Cat5e cable is used with ports/transceivers that have RJ-45 connectors.

- Attributes provided: 3m 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: Both
- CSU: Yes
- Return parts MES: No

(#1112) - 10m, Blue Cat5e Cable

This 10m Blue Cat5e cable is used with ports/transceivers that have RJ-45 connectors..

- Attributes provided: 10m 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: Both
- CSU: Yes
- Return parts MES: No

(#1113) - 25m, Blue Cat5e Cable

This 25m Blue Cat5e cable is used with ports/transceivers that have RJ-45 connectors.

- Attributes provided: 25m 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: Both
- CSU: Yes
- Return parts MES: No

(#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: 9999 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#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: 10 (Initial order maximum: 10)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section 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: 10 (Initial order maximum: 10)
- OS level required:
  - AIX - supported
  - IBM i - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- 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 300GB with 512 byte formatting and is 283GB 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/POWER9 system units.

- Attributes provided: 300GB/283GB 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: 1536 (Initial order maximum: 250)
- OS level required:
  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - supported in #5887

(#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 600GB with 512 byte formatting and is 571GB with 528 byte sector.

Limitation: 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/POWER9 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: 1536 (Initial order maximum: 250)
- OS level required:
  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - 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:
  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only one of features 2146 or 2147 may exist on a system Configuration report.

(#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:
  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only one of features 2146 or 2147 may exist on a system Configuration report.

(#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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#3632) - Widescreen LCD Monitor

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
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: Not supported in Mainland China.

(#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: n/a
- 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: n/a
- 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: n/a
- 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:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- 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)

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: 9999 (Initial order maximum: 0)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Supported
- 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: 9999 (Initial order maximum: 250)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#4558) - Power Cord To PDU/UPS, (100-240V/16A)

Standard IBM power jumper cord that goes from the system or chassis to the rack power distribution unit (PDU) Cable has C19 on one end (for C20 power supply connector on system or chassis) and C20 on the other end (for IBM PDU or a UPS with C19 receptacle).

If ordered with a server with factory integration specify, then IBM Manufacturing will select from the optimum cable length (1m, 1.5m, 2.5m, or 4.3m). If ordered without factory integration, then the 2.5M (8 foot) is shipped.

- Attributes provided: Power jumper cord (1m, 1.5m, 2.5m, or 4.3m)
- 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

(#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

#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

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4651) - Rack Indicator, Rack #1

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4652) - Rack Indicator, Rack #2

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4653) - Rack Indicator, Rack #3

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4654) - Rack Indicator, Rack #4

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4655) - Rack Indicator, Rack #5

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4656) - Rack Indicator, Rack #6

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4657) - Rack Indicator, Rack #7

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4658) - Rack Indicator, Rack #8

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4659) - Rack Indicator, Rack #9

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4660) - Rack Indicator, Rack #10

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4661) - Rack Indicator, Rack #11

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4662) - Rack Indicator, Rack #12

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4663) - Rack Indicator, Rack #13

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4664) - Rack Indicator, Rack #14

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4665) - Rack Indicator, Rack #15

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#4666) - Rack Indicator, Rack #16

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#5000) - Software Preload Required

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:
  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#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.

- Attributes provided: Four Port Fibre Channel Adapter
- Attributes required: 1 Empty PCIe Gen2 slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Supported by VIOS

(#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: 50 (Initial order maximum: 50)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Supported by VIOS

(#5748) - POWER GXT145 PCI Express Graphics Accelerator

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.

- 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
- 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 PCI Express Slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
  - AIX - supported
  - Linux - not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Only supported in CEC
  - Feature #5748 adapter is not supported in the PCIe Gen3 I/O Drawer

(#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: 9 (Initial order maximum: 0)
- OS level required:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later
  - SUSE Linux Enterprise Server 15, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5887) - EXP24S SFF Gen2-bay Drawer

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.

Limitations: 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: 64 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - IBM i - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: Does not apply
  Note: VIOS supported

(#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: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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

(#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

(#6458) - Power Cord 4.3m (14-ft), 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 #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: n/a
- 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: n/a
- 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: n/a
- 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, 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: n/a
- 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: n/a
- 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, Congo, Croatia, Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Polynesia, French Guyana, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea-Bissau, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Kazakhstan, Kyrgyzstan, Laos, Latvia, Lebanon, Lithuania, Luxembourg, Macau, Macedonia, Mali, Martinique, Mauritania, Mauritius, 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, Tunisia, 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: n/a
- 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: n/a
- 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, Nigeria, 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6492) - 4.3m (14-Ft) 1PH/60A (48A derated) 200-240V Power Cord

Feature #6492 is a 14-FT/4.3m 200-240V/48-60A 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- 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: 9999 (Initial order maximum: 250)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- 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: n/a
- 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: n/a
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6654) - 4.3m (14-Ft) 1PH/30A (24A derated) Power Cord

Feature #6654 is a 14-FT/4.3m 200-240V/24A-30A locking power cord with a Type 12 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6655) - 4.3m (14-Ft) 1PH/30A (24A derated) WR Power Cord

Feature #6655 is a 14-FT/4.3m 200-240V/24A-30A 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
- 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

(#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: PDU power cord
- 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

(#6657) - 4.3m (14-Ft) 1PH/32A Power Cord-Australia

This power cord provides power to a #5889, #7188 #9188, #7109, #EPTG, #EPTM, #EPTJ, #ECJM, #ECJG, #ECJJ, #ECJN, or #EPTN power distribution unit. It connects to a wall power outlet with a PDL plug.

- Attributes provided: Power connection for a PDU
- 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

(#6658) - 4.3m (14-Ft) 1PH/30A (24A derated) Power Cord-Korea

This power cord provides power to a #5889, #7188, #9188, #7109, #EPTG, #EPTM, #EPTJ, #ECJM, #ECJG, #ECJJ, #ECJN, or #EPTN power distribution unit. It connects to a wall power outlet with a Korean plug.

- Attributes provided: Power connection for a PDU
- 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

(#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: n/a
- 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: n/a
- 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: n/a
- 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: 250)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Both
- 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: n/a
- 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: n/a
- 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: n/a
- 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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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.

(#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: n/a
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#8143) - Linux Software Preinstall

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:
  - Refer to the Software Requirements section to find the supported O/S levels for Linux.
  - Linux - supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#8144) - Linux Software Preinstall (Business Partners)

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:
  - Refer to the Software Requirements section to find the supported O/S levels for Linux.
  - Linux - supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#8845) - USB Mouse

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: 9999 (Initial order maximum: 0)
- OS level required:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Linux - supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#9169) - Order Routing Indicator- System Plant

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9300) - Language Group Specify - US English

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9440) - New AIX License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9442) - New Red Hat License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9443) - New SUSE License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9444) - Other AIX License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9445) - Other Linux License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9446) - 3rd Party Linux License Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9447) - VIOS Core Counter

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: 48 (Initial order maximum: 48)
- OS level required: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9449) - Other License Core Counter

This feature is used to count the number of other cores licensed.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- 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

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: 48 (Initial order maximum: 48)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9461) - Month Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9462) - Day Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9463) - Hour Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9464) - Minute Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9465) - Qty Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9466) - Countable Member Indicator

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9700) - Language Group Specify - Dutch

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9703) - Language Group Specify - French

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9704) - Language Group Specify - German

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9705) - Language Group Specify - Polish

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9706) - Language Group Specify - Norwegian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9707) - Language Group Specify - Portuguese

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9708) - Language Group Specify - Spanish

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9711) - Language Group Specify - Italian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9712) - Language Group Specify - Canadian French

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9714) - Language Group Specify - Japanese

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9715) - Language Group Specify - Traditional Chinese (Taiwan)

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9716) - Language Group Specify - Korean

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9718) - Language Group Specify - Turkish

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9719) - Language Group Specify - Hungarian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9720) - Language Group Specify - Slovakian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9721) - Language Group Specify - Russian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9722) - Language Group Specify - Simplified Chinese (PRC)

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9724) - Language Group Specify - Czech

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9725) - Language Group Specify - Romanian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9726) - Language Group Specify - Croatian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9727) - Language Group Specify - Slovenian

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9728) - Language Group Specify - Brazilian Portuguese

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9729) - Language Group Specify - Thai

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: n/a
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#B0VP) - SP Machine Setup Support for Power

This feature indicates SP Machine Setup Support for Power.

- 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

(#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: 122 (Initial order maximum: 122)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Supports adapter#EC3B
  - Optical cables for the transceiver are: #EB2J and #EB2K
  - Copper cables for the transceiver are: #EB2B, #EB2H and ECBN

(#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 Ethenet connectivity. This copper cable has QSFP+ transceivers already attached to each end.
Note: Do not use this cable between switches.

- 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

(#EB2Z) - Lift Tool

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. #EB27 has a hand crank to lift and position up to 350 pounds or 159 kg. The #EB2Z length and width are 44 inches x 24.5 inches or 1.12 meters x 0.62 meters. 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: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB3M) - Power Supply - 2000W for Server (200-240 VAC)

One 200 - 400V, 1400 watt AC power supply.

The power supply is configurated 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 only supported on Model 44E to support processor features EPW4, EPW5 and EPW6.

- Attributes provided:
  AC Power Supply.
- 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

(#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

(#EB46) - 10Gb Optical Transceiver SFP+ SR

One optical transceiver for 10Gb Ethernet adapter such as #EC2S or #EC2R and also #EC2U or #EC2T using SFP+ SP. Does not include cable.

The 10 Gb optical transceiver is capable up to 300 M through the OM3 cable or 82 M through OM2 cable. Either one or both of the adapter's two SFP+ ports can be populated.

- Attributes provided: Optical Transceiver SFP+ SR 10Gb
- Attributes required: SFP+ 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

(#EB47) - 25Gb Optical Transceiver SFP28

One optical transceiver for 25Gb Ethernet adapter such as #EC2U or #EC2T using SFP28. Does not include cable.

The 25 Gb optical transceiver is capable up to 100 m through the OM4 cable or 70 M through OM3 cable. Either one or both of the adapters two SFP28 ports can be populated.
Note: The SFP28 25GbE transceiver only supports 25GbE speeds.

- Attributes provided: SFP28 optical transceiver
- Attributes required: SFP28 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

(#EB4J) - 0.5m SFP28/25GbE copper Cable

Feature EB4J is a passive 0,5 meter copper cable that contains a single high-speed copper pair, operating at data rates of up to 25 Gb/s. This cable can be used for either 25Gb Ethernet adapters or switches. Built onto each end of the cable is a passive SFP28 copper cable transceiver. Cables are available in various lengths: 0.5M - #EB4J, 1.0M=#EB4K, 1.5M=#EB4L, 2.0M=#EB4M

- Attributes provided: Copper cable with SFP28 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

(#EB4K) - 1.0m SFP28/25GbE copper Cable

Feature EB4K is a passive 1.0 meter copper cable that contains a single high-speed copper pair, operating at data rates of up to 25 Gb/s. This cable can be used for either 25Gb Ethernet adapters or switches. Built onto each end of the cable is a passive SFP28 copper cable transceiver. Cables are available in various lengths: 0.5M - #EB4J, 1.0M=#EB4K, 1.5M=#EB4L, 2.0M=#EB4M

- Attributes provided: Copper cable with SFP28 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

(#EB4L) - 1.5m SFP28/25GbE copper Cable

(No longer available as of December 31, 2020)

Feature EB4L is a passive 1.5 meter copper cable that contains a single high-speed copper pair, operating at data rates of up to 25 Gb/s. This cable can be used for either 25Gb Ethernet adapters or switches. Built onto each end of the cable is a passive SFP28 copper cable transceiver. Cables are available in various lengths: 0.5M - #EB4J, 1.0M=#EB4K, 1.5M=#EB4L, 2.0M=#EB4M

- Attributes provided: Copper cable with SFP28 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

(#EB4M) - 2.0m SFP28/25GbE copper Cable

Feature EB4M is a passive 2.0 meter copper cable that contains a single high-speed copper pair, operating at data rates of up to 25 Gb/s. This cable can be used for either 25Gb Ethernet adapters or switches. Built onto each end of the cable is a passive SFP28 copper cable transceiver. Cables are available in various lengths: 0.5M - #EB4J, 1.0M=#EB4K, 1.5M=#EB4L, 2.0M=#EB4M

- Attributes provided: Copper cable with SFP28 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

(#EB4P) - 2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE

Feature EB4P is a 2.0 meter, active optical 100Gb E to 4x25Gb E splitter cable. It provides connectivity between system units with a QSFP28 port on one side and up to four different SFP28 ports on the other side, such as a switch and four servers.

- Attributes provided: Copper splitter cable with QSFP28 and 4x SFP28 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

(#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 or #EC66 or #EC67 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

(#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

(#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 7965-94Y rack. A front door such as #EC01 is required on the 7965-94Y. 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 (this door hinges on either the left side or right side). 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 7965-94Y rack. Either feature number EC02 or feature EC05 is required on the 7965-94Y. 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 (this door hinges on either the left side or right side). 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 7965-94Y rack. Either feature EC02 or feature EC05 is required on the 7965-94Y. This door hinges on the right side. ("Right" is as you face the door from the outside of the rack).

- 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

(#EC2N) - PCIe3 2-port 10GbE NIC&RoCE SR Adapter

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.

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: 51 (Initial order maximum: 0)
- OS level required: Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server 15, or later, with Mellanox OFED 4.5, or later
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: NIM with NIC

(#EC2S) - PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter

This PCIe Gen3 Ethernet adapter provides two 10 Gb SFP+ 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.

Cables: For 10GbE, IBM offers Direct Attach (DAC) cables up to 5m. SFP-based transceivers are included on each end of the cables. See features EN01, EN02, EN03.

Transceivers: IBM qualifies and supports SFP+ optical transceiver (FC EB46) to install into the adapter. Customers can also use their own optical cabling and SFP+ optical transceiver for the other end. The 10 Gb optical transceiver is capable up to 300 M through the OM3 cable or 82 M through OM2 cable. Either one or both of the adapter's two SFP+ ports can be populated.

Feature code #EC2R and #EC2S have identical electronics and function and CCIN (58FA), but have different tail stock brackets. #EC2R is low profile and #EC2S is full high. The adapter is based on a Mellanox ConnectX-4 adapter which uses a ConnectX-4 Lx EN Network Controller.

Attributes:

- PCI Express 3.0 (up to 8GT/s) x8
- 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
- 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 interrupt
- NIM boot support
- PowerVM SR-IOV support
- Attributes provided: 2-port 10Gb Ethernet Adapter
- Attributes required: Full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.5 for Power LE (p8compat) or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS supported; NIC capability only

(#EC2U) - PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter

This PCIe Gen3 Ethernet adapter provides two 25/10 Gb SFP28 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.

Cables: For 25GbE, IBM offers SFP28 Passive Copper 25Gb Ethernet cables up to 2m. SFP28 based transceivers are included on each end of these cables. See features EB4J, EB4K, EB4L, and EB4M for a 0.5M, 1.0M, 1.5M and 2.0M copper cable.

For 10GbE, IBM offers Direct Attach (DAC) cables up to 5m. SFP-based transceivers are included on each end of the cables. See features EN01, EN02, EN03.

Transceivers: For 25 GbE, IBM qualifies and supports SFP28 optical transceiver (FC EB47) to install into the adapter. Customers can also use their own optical cabling and SFP28 optical transceiver for the other end. The 25 Gb optical transceiver is capable up to 100 m through the OM4 cable or 70 M through OM3 cable. Either one or both of the adapter's two SFP28 ports can be populated.
Note: The (FC EB47) SFP28 25GbE transceiver only supports 25GbE speeds.

For 10 GbE, IBM qualifies and supports SFP+ optical transceiver (FC EB46) to install into the adapter. Customers can also use their own optical cabling and SFP+ optical transceiver for the other end. The 10 Gb optical transceiver is capable up to 300 M through the OM3 cable or 82 m through OM2 cable. Either one or both of the adapter's two SFP28 ports can be populated.

Feature code #EC2T and #EC2U have identical electronics and function and CCIN (58FB), but have different tail stock brackets. #EC2T is low profile and #EC2U is full high. The adapter is based on a Mellanox ConnectX-4 adapter which uses a ConnectX-4 Lx EN Network Controller.

Attributes:

- PCI Express 3.0 (up to 8GT/s) x8
- 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
- IEEE 802.3ae (25Gb or 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 interrupt
- NIM boot support
- PowerVM SR-IOV support
- Attributes provided: 2-port 25/10Gb Ethernet Adapter
- Attributes required: Full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.5 for Power LE (p8compat) or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS supported; NIC capability only

(#EC38) - PCIe3 2-port 10GbE NIC&RoCE SFP+ Copper Adapter

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.

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: 51 (Initial order maximum: 0)
- OS level required: Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server 15, or later, with Mellanox OFED 4.5, or later
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported NIC capability only

(#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: 50 (Initial order maximum: 50)
- OS level required:
  - AIX supported
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4, with Mellanox OFED 4.5-2.2.0.1, or later
  - Red Hat Enterprise Linux 7 for Power LE, version 7.6, or later, with Mellanox OFED 4.5-2.2.0.1, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later, with Mellanox OFED 4.5-2.2.0.1, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5-2.2.0.1, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5-2.2.0.1, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported, NIC capability only

(#EC3M) - PCIe3 2-port 100GbE (NIC&RoCE) QSFP28 Adapter x16

(No longer available as of December 31, 2020)

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
- NIM boot support
- Backward compatible with 40Gb Ethernet when using compatible cables/transceivers.
- Attributes provided: 2-port 100Gb Ethernet Adapter
- Attributes required: x16 PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required: Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server 15, or later, with Mellanox OFED 4.5, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported 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: 50 (Initial order maximum: 50)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Only supported in #EMX0, PCIe Gen3 I/O Expansion Drawer

(#EC5B) - PCIe3 x8 1.6 TB NVMe Flash Adapter for AIX/Linux

The PCIe3 x8 1.6 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 3 (Gen3) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 58FC.

Feature #EC5G and #EC5B are identical cards except that the tailstock bracket is different. #EC5G fits a low profile PCIe slot. #EC5B fits a full high PCIe slot. See also #EC5D/EC5F for a card with more memory.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC5B can be used to meet minimum AIX/Linux SSD/HDD and backplane requirements.

- Attributes provided: 1.6 TB of low latency flash memory with boot capability
- Attributes required: PCIe slot in system unit
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - Red Hat Enterprise Linux 7 for Power LE, version 7.5, or later
  - Red Hat Enterprise Linux 7, for POWER9, version 7.6, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 3, or later
  - SUSE Linux Enterprise Server 15, or later
  - IBM i not supported
  - IBM i not supported via VIOS
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-03-1914, or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-04-1914, or later
  - AIX Version 7.2 with the 7200-01 Technology Level and Service Pack 7200-01-06-1914, or later (planned availability August 30, 2019)
  - AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-04-1914, or later (planned availability August 30, 2019)
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 7100-04-08-1914, or later (planned availability August 30, 2019)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 3.1.0.21 or later, VIOS 2.2.6.41, or later.

(#EC5D) - PCIe3 x8 3.2 TB NVMe Flash Adapter for AIX/Linux

The PCIe3 x8 3.2 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 3 (Gen3) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 58FD.

Feature #EC5C and #EC5D are identical cards except that the tailstock bracket is different. #EC5C fits a low profile PCIe slot. #EC5D fits a full high PCIe slot. See also #EC5F for a card with more memory.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC5D can be used to meet minimum AIX/Linux SSD/HDD and backplane requirements.

- Attributes provided: 3.2 TB of low latency flash memory with boot capability
- Attributes required: PCIe slot in system unit
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-03-1914, or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-04-1914, or later
  - AIX Version 7.2 with the 7200-01 Technology Level and Service Pack 7200-01-06-1914, or later (planned availability August 16, 2019)
  - AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-04-1914, or later (planned availability August 16, 2019)
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 7100-04-08-1914, or later (planned availability August 16, 2019)
  - Red Hat Enterprise Linux 7 for Power LE, version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 3.1.0.21, or later; VIOS 2.2.6.41, or later

(#EC5F) - PCIe3 x8 6.4 TB NVMe Flash Adapter for AIX/Linux

The PCIe3 x8 6.4 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 3 (Gen3) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 58FE.

Feature #EC5E and #EC5F are identical cards except that the tailstock bracket is different. #EC5E fits a low profile PCIe slot. #EC5F fits a full high PCIe slot. See also EC5D for a card with less memory.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC5F can be used to meet minimum AIX/Linux SSD/HDD and backplane requirements.

- Attributes provided: 6.4 TB of low latency flash memory with boot capability
- Attributes required: PCIe slot in system unit
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-03-1914, or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-04-1914, or later
  - AIX Version 7.2 with the 7200-01 Technology Level and Service Pack 7200-01-06-1914, or later (planned availability August 16, 2019)
  - AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-04-1914, or later (planned availability August 16, 2019)
  - AIX Version 7.1 with the 7100-04 Technology Level and Service Pack 7100-04-08-1914, or later (planned availability August 16, 2019)
  - Red Hat Enterprise Linux 7 for Power LE, version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 3.1.0.21, or later; VIOS 2.2.6.41, or later

(#EC5J) - Mainstream 800 GB SSD NVMe U.2 module

Mainstream 800 GB solid state drive (SSD) formatted in 4096 byte sectors (4K). The drive is U.2 2.5" 7mm form factor supporting NVMe PCIe Gen3 x 4 interface. Recommend to be used for boot support and non-write intensive workloads.

DWPD (Drive Write Per Day) rating is 2.4 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 (PB)
800 GB 3.5
1.6 TB 7
3.2 TB 14
```

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 POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

- Attributes provided: 800 GB low latency flash memory
- Attributes required: PCIe Gen3 slot in system unit
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EC5K) - Mainstream 1.6 TB SSD NVMe U.2 module

Mainstream 1.6 TB solid state drive (SSD) formatted in 4096 byte sectors (4K). The drive is U.2 2.5" 7mm form factor supporting NVMe PCIe Gen3 x 4 interface. Recommend to be used for boot support and non-write intensive workloads.

DWPD (Drive Write Per Day) rating is 2.4 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 (PB)
800 GB 3.5
1.6 TB 7
3.2 TB 14
```

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 POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

- Attributes provided: 1.6 TB low latency flash memory
- Attributes required: PCIe Gen3 slot in system unit
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS supported

(#EC5L) - Mainstream 3.2 TB SSD NVMe U.2 module

Mainstream 3.2 TB solid state drive (SSD) formatted in 4096 byte sectors (4K). The drive is U.2 2.5" 7mm form factor supporting NVMe PCIe Gen3 x 4 interface. Recommend to be used for boot support and non-write intensive workloads.

DWPD (Drive Write Per Day) rating is 2.4 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 (PB)
800 GB 3.5
1.6 TB 7
3.2 TB 14
```

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 POWER9 servers, see the Terms and Conditions section or IBM Knowledge Center for additional detail.

- Attributes provided: 3.2 TB low latency flash memory
- Attributes required: PCIe Gen3 slot in system unit
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux Supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS supported

(#EC63) - PCIe4 1-port 100Gb EDR IB CAPI adapter

The PCIe Gen4 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 Gen4 x16 PCIe slot is required. This adapter is sourced from Mellanox Corporation. based on ConnectX-5 technology. The adapter supports the InfiniBand Trade Association (IBTA) specification version 2.

The 100Gb port has a QSFP+ connection which supports EDR cables, either EDR DAC or EDR optical. Transceivers are included in the cables. IBM cable features EB50-EB54 (copper shorter distance) and #EB5A-EB5H (optical longer distance) are supported or their copper or optical Mellanox equivalents are supported. Other cables are not supported.

#EC62 and #EC63 adapters are electronically and functionally identical with the same CCIN of 2CF1. #EC62 is low profile and #EC63 is full high.

Limitation: Adapter does not fit in x8 PCIe slot. Adapter is not supported in a PCIe Gen3 I/O drawer.

- Attributes provided: EDR InfiniBand PCIe Adapter
- Attributes required: available x16 PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: Refer to the Software Requirements section to fin the supported O/S levels for AIX and Linux.
  - AIX - not supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server 15, or later, with Mellanox OFED 4.5, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC65) - PCIe4 2-port 100Gb EDR IB CAPI adapter

(No longer available as of April 24, 2020)

The PCIe Gen4 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 Gen4 x16 PCIe slot is required. This adapter is sourced from Mellanox Corporation. based on ConnectX-5 technology. The adapter supports the InfiniBand Trade Association (IBTA) specification version 2.

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. Transceivers are included in the cables. IBM cable features EB50-EB54 (copper shorter distance) and #EB5A-EB5H (optical longer distance) are supported or their copper or optical Mellanox equivalents are supported. Other cables are not supported.

#EC64 and #EC65 adapters are electronically and functionally identical with the same CCIN of 2CF2. #EC64 is low profile and #EC65 is full high.

Limitation: Adapter does not fit in x8 PCIe slot. Adapter is not supported in a PCIe Gen3 I/O drawer.

- Attributes provided: EDR InfiniBand PCIe Adapter
- Attributes required: available x16 PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: Refer to the Software Requirements section to fin the supported O/S levels for AIX and Linux.
  - AIX - not supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later, with Mellanox OFED 4.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later, with Mellanox OFED 4.5, or later
  - SUSE Linux Enterprise Server 15, or later, with Mellanox OFED 4.5, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC66) - PCIe4 2-port 100Gb ROCE EN adapter

This PCIe Gen4 Ethernet x16 adapter provides two 100 GbE 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.

For 100GbE network connectivity, IBM offers either passive copper twinax cables up to 2 meters 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 choose to order an IBM qualified and supported QSFP28 optical transceiver (feature #EB59) to put into the adapter ports and MTP/MPO cable 10M or 20M in length (feature #EB2J #EB2K) optical cabling to use with your own QSP28 optical transceiver for the other end.

For 40GbE network connectivity, IBM offers either passive copper twinax cables up to 3 meters in length. See features #EB2B and EB2H for a 1.0M and 3.0M copper cable. Transceivers are included on each end of these QSFP+ cables. Alternatively to the above supported cables, you may choose to order an IBM qualified and supported QSFP+ 40G BASE-SR optical transceiver (feature #EB27) to put into the adapter ports and MTP/MPO cable 10M or 20M in length (feature #EB2J #EB2K) optical cabling to use 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 #EC66 and #EC67 have identical electronics and function and CCIN (2CF3), but have different tail stock brackets. #EC66 is high profile and #EC67 is low profile. The adapter is based on a Mellanox ConnectX-5 adapter which uses a ConnectX-5 EN Network Controller.

Attributes:

- PCI Express 4.0 (up to 16GT/s) x16
- PCIe Gen 4.0 compliant, 1.1, 2.0 and 3.0 compatible
- RDMA over Converged Ethernet (RoCE)
- NIC and RoCE are concurrently supported
- RoCE supported on Linux and AIX
- NIC supported on all OSes
- TCP/UDP/IP stateless offload
- LSO, LRO, checksum offload
- NIM boot support
- Backward compatible with 40Gb Ethernet when using compatible cables/transceivers
- Attributes provided: Dual-port 100 GbE Adapter with RoCE capability
- Attributes required: Available Gen4 PCIe Slot
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.5 for Power LE (p8compat) or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later, with Mellanox OFED 4.4, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later, with Mellanox OFED 4.6, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 3, or later, with Mellanox OFED 4.4, or later

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS supported; NIC capability only

(#EC6K) - PCIe2 2-Port USB 3.0 Adapter

The PCIe Gen2 x8 short 2-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 #EC6J and #EC6K USB adapters are electronically identical with the same 590F CCIN. They differ physically in their tailstock. #EC6J is low profile and #EC6K 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: 50 (Initial order maximum: 50)
- OS level required:
  - Red Hat Enterprise Linux 8, for POWER LE, version 8.3, or later
  - SUSE Linux Enterprise Server 15, Service Pack 2, or later
  - AIX Version 7.2 with the 7200-05 Technology Level or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-07-2037 or later
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-06-2038 or later (Planned Availability date February 19, 2021)
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-03-2038 or later (Planned Availability date February 19, 2021)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assigment to the VIOS requires VIOS 3.1.2.10, or later

(#EC7B) - PCIe4 1.6TB NVMe Flash Adapter x8 for AIX/Linux

The PCIe4 x8 1.6 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 594A.

Feature #EC7A and #EC7B are identical cards except that the tailstock bracket is different. #EC7A fits a low profile PCIe slot. #EC7B fits a full high PCIe slot. See also #EC7C or #EC7D for a card with more memory.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC7A or #EC7B can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - Red Hat Enterprise Linux 8.2 for Power LE, or later
  - SUSE Linux Enterprise Server 15 Service Pack 2, or later
  - AIX Version 7.2 with the 7200-05 Technology Level or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-07-2037 or later
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-06-2038 or later (Planned Availability date February 19, 2021)
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-03-2038 or later (Planned Availability date February 19, 2021)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assigment to the VIOS requires VIOS 3.1.2.10, or later

(#EC7D) - PCIe4 3.2TB NVMe Flash Adapter x8 for AIX/Linux

The PCIe4 x8 3.2 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 594B.

Feature #EC7C and #EC7D are identical cards except that the tailstock bracket is different. #EC7C fits a low profile PCIe slot. #EC7D fits a full high PCIe slot. See also EC7E or EC7F for a card with more memory.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC7C or #EC7D can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - Red Hat Enterprise Linux 8.2 for Power LE, or later
  - SUSE Linux Enterprise Server 15 Service Pack 2, or later
  - AIX Version 7.2 with the 7200-05 Technology Level or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-07-2037 or later
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-06-2038 or later (Planned Availability date February 19, 2021)
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-03-2038 or later (Planned Availability date February 19, 2021)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assigment to the VIOS requires VIOS 3.1.2.10, or later

(#EC7F) - PCIe4 6.4TB NVMe Flash Adapter x8 for AIX/Linux

The PCIe4 x8 6.4 TB NVMe Adapter is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) x8 adapter. The adapter can be used in either a x8 or x16 PCIe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance software interface that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe Flash adapter provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

CCIN is 594C.

Feature #EC7E and #EC7F are identical cards except that the tailstock bracket is different. #EC7E fits a low profile PCIe slot. #EC7F fits a full high PCIe slot.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes are used instead of random writes, the maximum write capacity will be larger. To extend the life of the device, the application that is using the device must convert small random writes to larger sequential writes. Writes past the adapter's maximum write capacity will continue to work for some period of time, but much more slowly. Whether the application uses sequential or random reads from the device does not affect the life of the device. A Predictive Failure Analysis message will indicate that it is time to replace the adapter if enabled by the system administrator. Customers are recommended to monitor the smart log via their operating system where fuel gauge shows the percentage used.

IBM NVMe adapter failures will be replaced during the standard warranty and maintenance period for adapters that have not reached the maximum number of write cycles. Adapters that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data protection is not implemented in the card; protection is provided by OS mirroring or software RAID wherever applicable.

This adapter is not supported in the PCIe I/O drawer.
Note: NVMe Flash adapters #EC7E or #EC7F can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - Red Hat Enterprise Linux 8.2 for Power LE, or later
  - SUSE Linux Enterprise Server 15 Service Pack 2, or later
  - AIX Version 7.2 with the 7200-05 Technology Level or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-07-2037 or later
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-06-2038 or later (Planned Availability date February 19, 2021)
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-03-2038 or later (Planned Availability date February 19, 2021)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assigment to the VIOS requires VIOS 3.1.2.10, or later

(#ECB0) - 0.6m (2.0-ft), Blue CAT5 Ethernet Cable

This 0.6M Cat5e cables is used with ports/transceivers that have RJ-45 connectors.

- Attributes provided: 0.6m 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: Both
- CSU: Yes
- Return parts MES: No

(#ECB2) - 1.5m (4.9-ft), Blue CAT5 Ethernet Cable

This cable connects the Flex System Enterprise Chassis to managed PDUs and the IBM Storwize V7000 Disk System.

- Attributes provided: 1.5m Cat5 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: 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

(#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 or DVD. The tape drive or DVD 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 or DVD. 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 or DVD.

- Attributes provided: connection between PCIe3 SAS adapter with Mini-SAS HD Narrow connectors and a SAS tape drive or DVD 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 or DVD.
- 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.

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: Supported
- 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.

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: Supported
- 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.

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: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ECC4) - SAS AA Cable 6m - HD Narrow 6Gb Adapter to Adapter

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.

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: Supported
- 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 in a PCIe Gen3 Expansion Drawer
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- 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: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- 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: N/A
- Return parts MES: No

(#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: Cannot 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: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECCX) - 3M Active 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.

- 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

(#ECCY) - 10M Active 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.

- Attributes provided: Pair of 10 meter active optical cables
- Attributes required: CXP ports on a PCIe3 Optical Cable Adapter and on a PCIe3 module in 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

(#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 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 cannot be used with 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 cannot 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

http://www-912.ibm.com/e_dir/eServerPrereq.nsf

- 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 cannot 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

http://www-912.ibm.com/e_dir/eServerPrereq.nsf

- 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 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 cannot be used with 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 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 cannot be used with 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 cannot 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

http://www-912.ibm.com/e_dir/eServerPrereq.nsf

- 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 cannot 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

http://www-912.ibm.com/e_dir/eServerPrereq.nsf

- 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 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.

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:

1. 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.
2. 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 cache 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- 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: Does not apply

(#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

(#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

For China only

(#ECSJ) - NeuCloud Indicator/Specify

(No longer available as of October 9, 2018)

This is a no-charge specify code for helping IBM track orders for reporting purposes

- Attributes provided: none
- Attributes required: used in mainland China
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- 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: Does not apply

(#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

(#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

(#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: No

(#EHLU) - IBM Power Systems for SAS Viya (Linux)

This feature is applicable to IBM Power Systems for SAS Viya deals only. This is a no-cost feature for tracking purposes of the offering.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
  - Red Hat Enterprise Linux 7.4
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHLV) - IBM Power Systems for SAS 9.4 Grid (AIX)

This feature is applicable to IBM Power Systems for SAS 9.4 Grid deals only. This is a no-cost feature for tracking purposes of the offering.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
  - AIX Version 7.2, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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:
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- 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:
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- 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:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ08) - PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer

(No longer available as of December 31, 2020)

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 2CE2

EJ08 is similar to EJ05 and EJ07, 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:
  PCIe3 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S level for Linux.
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ0B) - Storage Backplane with Zero DASD 8 SAS 2.5" HDD/SDD Controllers

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EJ0C) - Storage Backplane with HI Performance plus 2x24-Port

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EJ0J) - PCIe3 RAID SAS Adapter Quad-port 6Gb 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.

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/POWER9 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.
- 177GB 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 12Gb cables such as #ECDJ, ECDT or #ECDU.

- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ0K) - PCIe3 RAID SAS Adapter Quad-port 6Gb x8 for MR9

The PCIe3 RAID SAS quad-port 6 Gb adapter is a PCI Express (PCIe), generation 3, SAS RAID adapter that has a low-profile, short-form factor, but packaged for full height installation. The adapter is used in high-performance and high-density, serial attached SCSI (SAS) applications. It supports the attachment of SAS disk by using four mini SAS high-density (HD) x4 connectors that allow the physical links to be used in various narrow and wide-port configurations. The adapter does not have write cache.

The adapter is a 64 bit, 3.3 V, bootable SAS adapter that provides RAID 0, 5, 6, and 10 capability, and system level mirroring via the operating system. The adapter provides both single and dual RAID controller configurations. The exception to this is when installed in PCIe slots C09 and/or C012 of the IBM Power System E950 (9040-MR9), the adapter will only run in single controller mode. In dual controller configurations (dual storage IOA) all attached devices must run RAID. JBOD (512 byte) functionality is supported only in a single controller configuration based on the operating system. Best performance is achieved when multiple RAID sets are configured and optimized under a pair of adapters in a high availability, multi- initiator RAID configuration (dual storage IOA) which allows for an Active-Active mode of operation.
Note: Dual controller configuration (dual storage IOA) is not supported when FC EJ0K is installed in PCIe slots C09 or C012 of the 9040-MR9.

The adapter supports a maximum of 96 attached disk devices that depends on the drive enclosure attached. A maximum of 48 devices can be solid-state devices (SSDs). Externally attached devices are designed to run at a maximum data rate of 6 Gbps for SAS disk devices. Specific device attachment rules apply. This adapter supports the multi-initiator and high availability (dual storage IOA) configurations in AIX, IBM i, and Linux partitions. This adapter enables configuring the SAS drives as dedicated hot-spares with equal or higher capacity.
Note: When FC EJ0K is installed in PCIe slots C09 or C12 of the 9040-MR9 controlling the internal SAS drive bays, any external disk drive enclosures attached must be configured in zone mode 2 only.

This adapter is not supported in the EMX0, "MEX drawers".

Attributes provided:

- Four external mini SAS HD 4x connectors provide attachment of SAS device enclosures
- SAS Serial SCSI Protocol (SSP) and Serial Management Protocol (SMP)
- RAID 0, 5, 6, or 10 with hot-spare capability. System level mirroring through the operating system is also supported. JBOD functionality (512 byte) is supported in a single controller configuration only.
- Concurrent firmware update
- Support for multi-initiator and high availability or single controller configurations
  - Minimum required: 0
  - Maximum allowed: 10 (Initial order maximum: 10)
  - OS level required:
  - Initial Order/MES/Both/Supported: Both
  - CSU: Yes
  - Return parts MES: No

(#EJ0L) - PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8

The PCIe3 12GB 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 12GB 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 can not be mixed in the same array.

Limitations:

- HDD and SSD can not 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.
- 177GB 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 he #EJ0L pairs must be located in that #5802/5803/EL36
- Attributes provided: Full high PCIe3 four port x8 adapter with up to 12GB 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 12Gb cables such as ECDT or #ECDU.

- Minimum required: 0
- Maximum allowed: 34 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later
  - SUSE Linux Enterprise Server 15, or later

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#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 tape 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: 34 (Initial order maximum: 34)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS supported

(#EJ14) - PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8

The PCIe3 12GB 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 12GB 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 #EJ14 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 12Gb cables such as ECDT or #ECDU.
- Minimum required: 0
- Maximum allowed: 34 (Initial order maximum: 34)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 2.2.4.20 or later

(#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: 50 (Initial order maximum: 50)
- OS level required:
  - IBM i - not supported
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ20) - PCIe x16 to CXP Optical or CU converter 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 2CF5.

Feature EJ20 is a follow on product to the EJ08. Feature EJ20 is only supported on I/O expansion drawer with the PCIe3 6-slot fanout module (feature #EMXH).

- Attributes provided: PCIe3 adapter with two CXP ports to attach two active optical cables or two CXP copper cables.
- Attributes required: PCIe3 x16 slot in system unit plus a pair of CXP cables (one cable pair feature such as optical cable #ECCX, #ECCY or copper cable #ECCS).
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJ27) - PCIe Crypto Coprocessor No BSC 4765-001

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.

#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 standard
- 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/Decrypt using AES and DES keys
- Attributes provided: Cryptographic Coprocessor and Accelerator Functions
- Attributes required: One full-high PCIe slot which does not use a blind swap cassette
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
- Initial Order/MES/Both/Supported: Supported
- CSU: N/A
- Return parts MES: No

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

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: 48 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
- Initial Order/MES/Both/Supported: Supported
- CSU: N/A
- Return parts MES: No

(#EJ32) - PCIe3 Crypto Coprocessor no BSC 4767

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 doesn't use a blind swap cassette
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.4, little endian, or later
  - Red Hat Enterprise Linux 8.0, or later
  - SUSE Enterprise Linux Server 12 SP3, or later
  - SUSE Enterprise Linux Server 15, or later

  Note: Please download the latest device driver from: https://www03.ibm.com/security/cryptocards/pciecc2/overview.shtml
- 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 standard
- 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: 48 (Initial order maximum: 48)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.4, little endian, or later
  - Red Hat Enterprise Linux 8.0, or later
  - SUSE Enterprise Linux Server 12 SP3, or later
  - SUSE Enterprise Linux Server 15, or later

  Note: Please download the latest device driver from: https://www03.ibm.com/security/cryptocards/pciecc2/overview.shtml
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJBB) - Storage Backplane Base DASD 8 SAS 2.5" HDD/SDD Controllers

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - IBM i - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - IBM i - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJRA) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (1) 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 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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) 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJRK) - Specify Mode-2 & (1 or 2)EJ0K for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 32 (Initial order maximum: 32)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required: None
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- 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: 48 (Initial order maximum: 48)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRV) - Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24S (#5887/EL1S)

(No longer available as of December 31, 2020)

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJSB) - Storage Backplane Split DASD 8 SAS 2.5" HDD/SDD Controllers

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EJV1) - Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 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: 64 (Initial order maximum: 64)
- 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 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: 64 (Initial order maximum: 64)
- 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 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 "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: 64 (Initial order maximum: 64)
- 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(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- 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 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14 and #ESLS or #ESLL 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #ESLL or #ELLL to find the supported O/S levels.
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJVW) - Specify Mode-2 &(1or2)EJ0K &(2)YO12G for EXP24SX #ESLS/ELLS

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJVV)-Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW1) - Specify Mode-1 1(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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 1(4)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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 1(4)EJ0J/EK0K/EJ0M/EL3B/EL59 1(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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: 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(1)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- OS level required: 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 1(2)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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 "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 #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: 64 (Initial order maximum: 64)
- OS level required: 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(1)EJ0J/EJ0M/EJ0K/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- OS level required: 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 1(2)EJ0J/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- OS level required: 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 1(3)EJ0J/EJ0K/EJ0M/EL3B/EL59 1(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: 64 (Initial order maximum: 64)
- OS level required: 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14 and #ESLS or #ESLL 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14 and #ESLS or #ESLL 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14 and #ESLS or #ESLL 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #EJ14 and #ESLS or #ESLL 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: MES
- 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: MES
- 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 when a subset of adapters and cables are 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: MES
- 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: 64 (Initial order maximum: 64)
- OS level required: Refer to #ESLS or #ELLS to find the supported O/S levels.
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EJWV)-Specify Mode-1 & (2)EJ14 & (2)YO12G for EXP24SX #ESLS/ELLS

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWW) - Specify Mode-2 &(1or2)EJ0K &(2)YO12G for EXP24SX #ESLS/ELLS

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELBG) - 1-core Linux Processor Activation for #EPWR

- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELBH) - 1-core Linux Processor Activation for #EPWT

- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELBJ) - PowerVM for Linux indicator

- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELBP) - 1-core Linux Processor Activation for #EPWS

- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 40)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELBR) - 1-core Linux Processor Activation for #EPWY

- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 44)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.

- 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 #EPTJ, #EPTN, #7188 or #7109 when the PDU is located in a 7965-S42, 7965-94Y, 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

(#ELNP) - Power IFL Memory Activation

(No longer available as of April 23, 2019)

- Attributes required: Package IFL feature on server
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EM03) - Memory Riser Card

- Minimum required: 2
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM6A) - 8 GB DDR4 Memory

(No longer available as of August 7, 2020)

- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM6B) - 16 GB DDR4 Memory

- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM6C) - 32 GB DDR4 Memory

- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM6D) - 64 GB DDR4 Memory

- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EM6E) - 128 GB DDR4 Memory

- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EM81) - Active Memory Mirroring

Active Memory Mirroring for Hypervisor is an option which mirrors the main memory used by the firmware. With this option, an uncorrectable error resulting from failure of main memory used by system firmware will not cause a system-wide outage. This option efficiently guards against system-wide outages due to any such uncorrectable error associated with firmware. With this option, uncorrectable errors in data owned by a partition or application will be handled by the existing Special Uncorrectable Error Handling methods in the hardware, firmware and OS.

- Attributes provided: Enables Main memory mirroring used by system firmware
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
  - Linux supported
  - AIX 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

(#EM9B) - 64 GB DDR4 Memory Dimm

Provides 64 GB running at 2666Mhz 16Gbit DDR4 system memory.

- Attributes provided: 64GB Memory Dimm
- Attributes required: Available memory slot
- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM9C) - 128 GB DDR4 Memory Dimm

Provides 128 GB running at 2666Mhz 16Gbit DDR4 system memory.

- Attributes provided: 128 GB Memory Dimm
- Attributes required: Available memory slot
- Minimum required: 0
- Maximum allowed: 128 (Initial order maximum: 128)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EM9U) - 90 Days Elastic CoD Memory Enablement

(No longer available as of December 31, 2020)

The 90 Days Elastic CoD Memory Enablement (#EM9U) feature can be ordered to enable your server for Elastic Capacity on Demand. You must sign an Elastic Capacity on Demand contract and the Sales Channel has to register the server before an MES order can be fulfilled for #EM9U. Feature code #EM9U provides access to Elastic CoD memory resources for 90 days. Access to these resources is measured in GB-days. For example, if there are 100 GBs of inactive, CoD memory installed, this feature will enable usage of 9000 GB-days (9 TB-days) before disabling Elastic CoD access to the inactive memory.

After usage of this feature has been exhausted, additional temporary usage of Elastic CoD memory resources may be activated by ordering another Elastic CoD enablement code, #EM9U. Before ordering a fourth enablement code, after the system maximum of 3 has been reached, the current code must be RPO deleted from the configuration file with a MES delete order.

Usage of Elastic temporary CoD memory is billed by ordering #EMJE - 8GB-Day Memory Activation, #EMJF - 800 GB-Day Memory Activations.

- Attributes provided: This feature provides access to Elastic inactive CoD memory resources for 90 days
- Attributes required: Inactive CoD Memory
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature.

(#EMAM) - Power Active Memory Expansion

- 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

(#EMAP) - 1GB Memory Activation

Each occurrence of this feature will permanently activate 1 GB of POWER9 memory.

Activation is associated with the server for which it was ordered. If the physical memory is moved to a different server, the activation does not move with the memory.

- Attributes provided:
  1GB Memory Activation.

- Attributes required:
  1 GB of inactive memory

- Minimum required: 0
- Maximum allowed: 16384 (Initial order maximum: 250)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EMAQ) - Quantity of 100 1GB Memory Activations

Each occurrence of this feature will permanently activate 100 GB of POWER9 memory.

Activations are associated with the server for which they were ordered. If the physical memory is moved to a different server, the activations do not move with the memory.

- Attributes provided: Quantity of 100 1GB Memory Activation.
- Attributes required: 100 GB of inactive memory
- Minimum required: 0
- Maximum allowed: 163 (Initial order maximum: 163)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EMBE) - 512 GB Linux Memory Activations for MR9

- Attributes provided: Activates memory hardware only in the system serial number for which they are purchased.
- Attributes required: Inactive Memory available for temporary use installed
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
  - IBM i - not supported
  - AIX - not supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMEF) - VRM DDR4 Memory for MR9

- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EMJE) - 8 GB-Day Billing for Elastic CoD Memory

(No longer available as of December 31, 2020)

Provides 8 GB-Day of billing based on the reported usage of Elastic CoD Memory.

After Elastic Memory function is enabled in a system, you must report your elastic (On/Off) usage to IBM at least monthly. This information, used to compute your billing data, is provided to your sales channel. The sales channel will place an order on your behalf for the quantity of memory days for which you owe payment. Combining #EMJA 8-GB-day, #EMJB 800-GB-day, and #EMJC Qty 999 GB-Day CoD Memory billing features allow the appropriate number of days to be billed.

- Attributes provided: Payment for 8 GB-DAY of Elastic memory use
- Attributes required: Elastic Capacity on Demand contract
- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EMJF) - 800 GB-Day Billing for Elastic CoD Memory

(No longer available as of December 31, 2020)

Provides 800 GB-Days of billing based on the reported usage of Elastic CoD Memory.

After Elastic Memory function is enabled in a system, you must report your elastic (On/Off) usage to IBM at least monthly. This information, used to compute your billing data, is provided to your sales channel. The sales channel will place an order on your behalf for the quantity of memory days for which you owe payment. Combining #EMJA 8-GB-day, #EMJB 800-GB-day, and #EMJC Qty 999 GB-Day CoD Memory billing features allow the appropriate number of days to be billed.

- Attributes provided: Payment for 800 GB-DAYS of Elastic memory use
- Attributes required: Elastic Capacity on Demand contract
- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#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) can be 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 CXP cable (AOC) pair or CXP copper cable 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 cannot 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: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: When the operating system is Linux, PowerVM is required for support of the I/O Expansion Drawer.

(#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: 4 (Initial order maximum: 4)
- 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

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: 8 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software requirements section for specific O/S levels supported.
- Initial Order/MES/Both/Supported: Supported
- 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: 8 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EMXH) - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer

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 (only allowed to connect to #EJ19, or #EJ20, or #EJ1R PCIe3 Optical Cable Adapter). 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.

Limitations:

- Mixing of prior PCIe3 fanout modules (#EMXF, #EMXG, #ELMF, #ELMG) with PCIe3 fanout module (feature #EMXH) in the same I/O Expansion Drawer is not allowed
- Mixing of I/O Expansion Drawer with prior PCIe3 fanout modules (#EMXF, #EMXG, #ELMF, #ELMG) and I/O Expansion Drawer with PCIe3 fanout modules #EMXH in same configuration is allowed
- Prior PCIe3 fanout modules (#EMXF, #EMXG, #ELMF, #ELMG) are only allowed to connect with prior PCIe3 Optical Cable Adapter (#EJ05, #EJ08, or #EJ07)
- PCIe3 Optical Cable Adapters (#EJ19, #EJ20, or #EJ1R) requires to use Optical Cables (#ECCR, #ECCX, ECCY, or #ECCZ, or copper cable #ECCS)
- 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.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  - Firmware 9.20, or later for copper CXP cables

(#EN01) - 1m (3.3-ft), 10Gb E'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: N/A
- 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: N/A
- 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: N/A
- 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 16Gb Fibre Channel capability using SR optics. Each port can provide up to 16Gb Fibre Channel functions simultaneously. The adapter was initially announced as PCIe Gen2, but upgrades to the adapter firmware and introduction of POWER8/POWER9 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

- Attributes provided: Two 16Gb FC ports (with LC connectors)
- Attributes required: Available PCIe Gen2 or Gen3 slot in supported server
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - AIX - supported
  - Linux - 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

(#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.

- Attributes provided: Dual port Fibre Channel adapter
- Attributes required: Full High PCIe slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later
  - SUSE Linux Enterprise Server 15, or later
  - AIX - supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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/POWER9 servers have enabled PCIe Gen3.

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

Important: There is no FCoE support on POWER9 systems.

- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot
- Minimum required: 0
- Maximum allowed: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: SR-IOV requires:
  - HMC

(#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/POWER9 servers have enabled PCIe Gen3.

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

Important: There is no FCoE support on POWER9 systems.

- Attributes provided: Four ports - two 10Gb CNA and two 1Gb E
- Attributes required: PCIe Gen2 or Gen3 slot
- Minimum required: 0
- Maximum allowed: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: SR-IOV requires:
  - HMC

(#EN0M) - PCIe3 4-port(10Gb FCoE & 1GbE) LR&RJ45 Adapter

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.

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

Important: There is no FCoE support on POWER9 systems.

- 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: 50 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.6 for Power LE (p8compat), or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.6, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 Service Pack 4, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 , or later li.SUSE Linux Enterprise Server 15, or later

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
  Note: SR-IOV requires:
  - HMC

(#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:

- VIOS 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 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: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 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: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 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.

Features #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:

- NIM install supported for VIOS, AIX, and Linux
- 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 adapter
- Attributes provided: Two 10G-BaseT ports
- Attributes required: PCIe Gen2 or Gen3 slot - full high
- Minimum required: 0
- Maximum allowed: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: VIOS 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 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.
- Attributes provided: 4-port 8Gb Fibre Channel Adapter
- Attributes required: Available PCIe Gen3 slot in #EMX0 Expansion Drawer
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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.

#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 or Power E870C/E880C 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: 51 (Initial order maximum: 51)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

  Note: SR-IOV requires:
  - HMC

(#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.

#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 or Power E870C/E880C 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: 51 (Initial order maximum: 51)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: SR-IOV requires:
- HMC

(#EN1A) - PCIe3 32Gb 2-port Fibre Channel Adapter

PCIe Gen3 32 Gigabit dual-port Optical Fibre Channel (FC) Adapter is a high-performance 8x short form adapter based on the Broadcom LPe32000-series PCIe Host Bus Adapter (HBA). The adapter provides two ports of 32Gb Fibre Channel capability using SR optics. Each port can provide up to 32Gb Fibre Channel functions simultaneously.

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 8, 16, and 32Gbps and will automatically negotiate to the highest speed possible.

Feature #EN1A and #EN1B are electronically identical. They differ physically only that EN1A has a tail stock for full high PCIe slots and #EN1B has a short tail stock for low profile PCIe slots.

CCIN is 578F for both features.

Each port has two LED indicators located on the bracket next to each connector. These LEDs communicate boot status and give a visual indication of the operating state. The LEDs have five defined states; solid on, solid off, slow blink, fast blink, and flashing. The slow blink rate is 1Hz, the fast blink is 4Hz, and the flashing refers to an irregular on/off transition that reflects test progress. The operator should observe the LED sequence for several seconds to ensure that the operating state is correctly identified.

Cables:

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 with LC connectors o 4GFC: 0.5m - 400m o 8GFC: 0.5m - 190m o 16GFC: 0.5m - 125m o 32GFC: 0.5m - 100m
- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 380m o 8GFC: 0.5m - 150m o 16GFC: 0.5m - 100m o 32GFC: 0.5m - 70m
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 150m o 8GFC: 0.5m - 50m o 16GFC: 0.5m - 35m o 32GFC: 0.5m - 20m
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 70m o 8GFC: 0.5m - 21m o 16GFC: 0.5m - 15m o 32GFC: N/A

Note: The H/W cannot detect what length and type of cable is installed. The link will auto-negotiate to the speed reported during negotiation by the Target. The user must manually set the maximum negotiation speed. If too high of speed is selected, bit errors may occur.
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-port 32Gb Optical FC
- Attributes required: Full high profile PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.5 for Power LE (p8compat) or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 supported via NPIV only
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 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: Assignment to the VIOS supported

(#EN1C) - PCIe3 16Gb 4-port Fibre Channel Adapter

PCIe Gen3 16 Gigabit quad-port Optical Fibre Channel (FC) Adapter is a high-performance x8 short form PCIe adapter based on the Emulex LPe31004 PCIe Host Bus Adapter (HBA). The adapter provides four ports of 16Gb Fibre Channel capability using SR optics. Each port can provide up to 16Gb Fibre Channel functions simultaneously.

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.

Feature #EN1C and #EN1D are electronically identical. They differ physically only that EN1C has a tail stock for full high PCIe slots and #EN1D has a tail stock for low profile PCIe slots.

CCIN is 578E for both features.

Each port has two LED indicators located on the bracket next to each connector. These LEDs communicate boot status and give a visual indication of the operating state. The LEDs have five defined states; solid on, solid off, slow blink, fast blink, and flashing. The slow blink rate is 1Hz, the fast blink is 4Hz, and the flashing refers to an irregular on/off transition that reflects test progress. The operator should observe the LED sequence for several seconds to ensure that the operating state is correctly identified.

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 with LC connectors o 4GFC: 0.5m - 400m o 8GFC: 0.5m - 190m o 16GFC: 0.5m - 125m o 32GFC: 0.5m - 100m
- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 380m o 8GFC: 0.5m - 150m o 16GFC: 0.5m - 100m o 32GFC: 0.5m - 70m
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 150m o 8GFC: 0.5m - 50m o 16GFC: 0.5m - 35m o 32GFC: 0.5m - 20m
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 70m o 8GFC: 0.5m - 21m o 16GFC: 0.5m - 15m o 32GFC: N/A

Note: The H/W cannot detect what length and type of cable is installed. The link will auto-negotiate to the speed reported during negotiation by the Target. The user must manually set the maximum negotiation speed. If too high of speed is selected, bit errors may occur.
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 16Gb Optical FC
- Attributes required: Full high profile PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - AIX - supported
  - Red Hat Enterprise Linux 7.5 for Power LE (p8compat) or later
  - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 7 for Power LE version 7.5, or later
  - Red Hat Enterprise Linux 8.0 for Power LE, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 11 Service Pack 4 supported via NPIV only
  - SUSE Linux Enterprise Server 12 Service Pack 3, or later
  - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 12 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: Assignment to the VIOS supported

(#EN1G) - PCIe3 2-Port 16Gb Fibre Channel Adapter

The PCIe3 x8 dual-port Fibre Channel (16 Gb/s) adapter is a PCI Express (PCIe) generation 3 (Gen3) x8 adapter. This PCIe adapter is based on the Marvell QLE2692 PCIe host bus adapter 15.2 cm x 7 cm (6.6 inches x 2.7 inches). The adapter provides two ports of 16 Gb Fibre Channel capability by using SR optics. Each port can provide up to 3,200 Mbps bandwidth per port. Each port provides single initiator capability over a fiber optic link or with N_Port ID Virtualization (NPIV) it provides multiple initiator capabilities. The ports are SFP+ and include an optical SR transceiver. The ports have LC type connectors and use shortwave laser optics. The adapter operates at link speeds of 4, 8, and 16 Gbps and it automatically negotiates to the highest speed possible. The adapter supports start up on IBM Power Systems with FCode.

Feature #EN1G and #EN1H are electronically identical. They differ physically only that the #EN1G has a tail stock for full height PCIe slots and the #EN1H has a low profile tail stock.

CCIN is 579B for both features.

Each port has two LED indicators located on the bracket next to each connector. These LEDs communicate boot status and give a visual indication of the operating state. The LEDs have five defined states; solid on, solid off, slow blink, fast blink, and flashing. The slow blink rate is 1Hz, the fast blink is 4Hz, and the flashing refers to an irregular on/off transition that reflects test progress. The operator should observe the LED sequence for several seconds to ensure that the operating state is correctly identified.

Cables:

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 with LC connectors o 4GFC: 0.5m - 400m o 8GFC: 0.5m - 190m o 16GFC: 0.5m - 125m o 32GFC: 0.5m - 100m
- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 380m o 8GFC: 0.5m - 150m o 16GFC: 0.5m - 100m o 32GFC: 0.5m - 70m
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 150m o 8GFC: 0.5m - 50m o 16GFC: 0.5m - 35m o 32GFC: 0.5m - 20m
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 70m o 8GFC: 0.5m - 21m o 16GFC: N/A o 32GFC: N/A

Note: The hardware cannot detect the type and length of cable that is installed. The link auto-negotiates to the speed that is reported during negotiation by the target. You must manually set the maximum negotiation speed. If the speed value is set higher than the supported cable value, bit errors can occur.
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.

Limitations: This adapter is not supported in India.

- Attributes provided: Enhanced diagnostics and manageability, Unparalleled performance and more efficient port utilization, Single initiator capability over a fiber optic link or with NPIV, 16 Gb/s of throughput per port, Multiple initiator capabilities.
- Attributes required: Full high profile PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-02-2028, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assignment to the VIOS requires VIOS 3.1.1.25, or later

(#EN2A) - PCIe3 16Gb 2-port Fibre Channel Adapter

PCIe Gen3 16 Gigabit dual-port Optical Fibre Channel (FC) Adapter is a high-performance 8x short form adapter PCIe Host Bus Adapter (HBA). The adapter provides two ports of 16Gb Fibre Channel capability using SR optics. Each port can provide up to 16Gb Fibre Channel functions simultaneously.

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 8 and 16Gbps and will automatically negotiate to the highest speed possible.

Feature #EN2A and #EN2B are electronically identical. They differ physically only that EN2A has a tail stock for full high PCIe slots and #EN2B has a short tail stock for low profile PCIe slots.

CCIN is 579D for both features.

Each port has two LED indicators located on the bracket next to each connector. These LEDs communicate boot status and give a visual indication of the operating state. The LEDs have five defined states; solid on, solid off, slow blink, fast blink, and flashing. The slow blink rate is 1Hz, the fast blink is 4Hz, and the flashing refers to an irregular on/off transition that reflects test progress. The operator should observe the LED sequence for several seconds to ensure that the operating state is correctly identified.

Cables:

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 with LC connectors o 4GFC: 0.5m - 400m o 8GFC: 0.5m - 190m o 16GFC: 0.5m - 125m o 32GFC: 0.5m - 100m
- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 380m o 8GFC: 0.5m - 150m o 16GFC: 0.5m - 100m o 32GFC: 0.5m - 70m
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 150m o 8GFC: 0.5m - 50m o 16GFC: 0.5m - 35m o 32GFC: 0.5m - 20m
- OM1 - multimode 62.5/125 micron fibre, 200 MHz*km bandwidth with LC connectors o 4GFC: 0.5m - 70m o 8GFC: 0.5m - 21m o 16GFC: 0.5m - 15m o 32GFC: N/A

Note: The H/W cannot detect what length and type of cable is installed. The link will auto-negotiate to the speed reported during negotiation by the Target. The user must manually set the maximum negotiation speed. If too high of speed is selected, bit errors may occur.
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-port 16Gb Optical FC
- Attributes required: Full high profile PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 50 (Initial order maximum: 50)
- OS level required:
  - Red Hat Enterprise Linux 8, for POWER LE, version 8.2, or later
  - SUSE Linux Enterprise Server 15, Service Pack 2, or later
  - SUSE Linux Enterprise Server 12, Service Pack 5, or later
  - AIX Version 7.2 with the 7200-05 Technology Level or later
  - AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-07-2037 or later
  - AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7200-03-06-2038 or later (Planned Availability date February 19, 2021)
  - AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-03-2038 or later (Planned Availability date February 19, 2021)
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
  Note: Assigment to the VIOS requires VIOS 3.1.2.10, or later

(#EP20) - Power Enterprise Pools 2.0 Enablement

Power Enterprise Pools 2.0 Enablement

- Attributes provided: Power Enterprise Pools 2.0
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EP9T) - 90 Days Elastic CoD Processor Core Enablement

(No longer available as of October 31, 2019)

90 Days Elastic CoD Processor Core Enablement (#EP9T) feature can be ordered to enable your server for Capacity on Demand. You must sign an Elastic Capacity on Demand contract and the Sales Channel has to register the server before an MES order can be fulfilled for #EP9T. Feature code #EP9T provides access to Elastic CoD processor resources for 90 days. Access to these resources is measured in processor-days. For example, if there are 32-cores of inactive, CoD processors installed, this feature will enable using 2880 processor-days before disabling CoD access to the inactive CoD processors.

After usage of this feature has been exhausted, additional temporary usage of Elastic CoD processor resources may be activated by ordering another Elastic CoD enablement code, #EP9T. Before ordering a fourth enablement code, after the system maximum of 3 has been reached, the current code must be RPO deleted from the configuration file with a MES RPO delete order.

Usage of Elastic CoD processors is billed by ordering either Elastic Proc. CoD Billing for 1 Proc-day. There is a different Elastic Billing feature code available for each processor feature installed in a 8412, 9117, 9119 or 9179 MT. The maximum Elastic proc- days billable on any one order is 9,999.

- Attributes provided: This feature provides access to Elastic inactive CoD processor resources for 90 days
- Attributes required: Inactive CoD processor cores.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
  - Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
  - AIX - Supported
  - Linux - Supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature.

(#EPA0) - Deactivation of LPM (Live Partition Mobility)

This feature codes provides firmware commands to deactivate LPM.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPN0) - 1 Proc-day Elastic billing for #EPWR/EPWK

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPN1) - 100 Proc-day Elastic COD billing #EPWR/EPWK AIX

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPN2) - 100 Proc-mins Utility COD billing #EPWR/EPWK

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EPN3) - 1-core Processor Activation for #EPWY

- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 44)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPN5) - 1 Proc-day Elastic billing for #EPWS/EPWL

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPN6) - 100 Proc-day Elastic COD billing #EPWS/EPWL AIX

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPN7) - 100 Proc-mins Utility COD billing #EPWS/EPWL

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EPN8) - 1 Proc-day Elastic billing for #EPWY/EPWZ

(No longer available as of December 31, 2020)

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPN9) - 100 Proc-day Elastic COD billing #EPWY/EPWZ AIX

(No longer available as of December 31, 2020)

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPNK) - 1 Proc-day Elastic billing for #EPWT/EPWM

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPNL) - 100 Proc-day Elastic COD billing #EPWT/EPWM AIX

(No longer available as of December 31, 2020)

- 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: Does not apply
  Note: Customer is limited to select a quantity between 0 and 4 for this feature on a single MES order.
  Note: It is required to request RPQ 8A2602 authorization to configure and schedule this feature

(#EPNM) - 100 Proc-mins Utility COD billing #EPWT/EPWM

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EPNN) - 100 Proc-mins Utility COD billing #EPWY/EPWZ

- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: Does not apply

(#EPQ0) - 1 core Base Processor Activation (Pools 2.0) for EPWR

One processor core activation on Processor Card #EPWR for Pools 2.0 to support any OS.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWR for Pools 2.0 to support any OS.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ1) - 1 core Base Processor Activation (Pools 2.0) for EPWS

One processor core activation on Processor Card #EPWS for Pools 2.0 to support any OS.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWS for Pools 2.0 to support any OS.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 40)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ2) - 1 core Base Processor Activation (Pools 2.0) for EPWT

One processor core activation on Processor Card #EPWT for Pools 2.0 to support any OS.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWT for Pools 2.0 to support any OS.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ3) - 1 core Base Processor Activation (Pools 2.0) for EPWY

One processor core activation on Processor Card #EPWY for Pools 2.0 to support any OS.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWY for Pools 2.0 to support any OS.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 44)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ4) - 1 core Base Linux Processor Activation (Pools 2.0) for EPWR

One processor core activation on Processor Card #EPWR for Pools 2.0 to support Linux/VIOS only.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWR for Pools 2.0 to support Linux only.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ5) - 1 core Base Linux Processor Activation (Pools 2.0) for EPWS

One processor core activation on Processor Card #EPWS for Pools 2.0 to support Linux/VIOS only.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWS for Pools 2.0 to support Linux only.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 40)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ6) - 1 core Base Linux Processor Activation (Pools 2.0) for EPWT

One processor core activation on Processor Card #EPWT for Pools 2.0 to support Linux/VIOS only.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWT for Pools 2.0 to support Linux only.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ7) - 1 core Base Linux Processor Activation (Pools 2.0) for EPWY

One processor core activation on Processor Card #EPWY for Pools 2.0 to support Linux/VIOS only.

- Attributes provided: Each occurrence of this feature will permanently activate one processor core on Processor Card #EPWY for Pools 2.0 to support Linux only.
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 44)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQ8) - 1 GB Base Memory Activation (Pools 2.0)

Feature EPQ8 allows the activation of 1 GB Memory for Pools 2.0

- Attributes provided: 1 Memory Activation for Pools 2.0
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQ9) - 100 GB Base Memory Activation (Pools 2.0)

Feature EPQ9 allows the activation of 100 GB Memory for Pools 2.0

- Attributes provided: 100 Memory Activation for Pools 2.0
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQA) - 256 GB Base Memory Activation (Pools 2.0)

Feature EPQA allows the activation of 256 GB Memory for Pools 2.0

- Attributes provided: 256 Memory Activation for Pools 2.0
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 254)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPQB) - 1 core Base Proc Act (Pools 2.0) for #EPWR (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWR for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWR
- Attributes required: #EPWR with inactive processor cores
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQC) - 1 core Base Proc Act (Pools 2.0) for #EPWS (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWS for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWS
- Attributes required: #EPWS with inactive processor cores
- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQD) - 1 core Base Proc Act (Pools 2.0) for #EPWT (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWT for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWT
- Attributes required: #EPWT with inactive processor cores
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQE) - 1 core Base Proc Act (Pools 2.0) for #EPWY (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWY for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWY
- Attributes required: #EPWY with inactive processor cores
- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQF) - 1 core Base Proc Act (Pools 2.0) for #EPWR Linux (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWR for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWR
- Attributes required: #EPWR with inactive processor cores
- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQG) - 1 core Base Proc Act (Pools 2.0) for #EPWS Linux (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWS for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWS
- Attributes required: #EPWS with inactive processor cores
- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQH) - 1 core Base Proc Act (Pools 2.0) for #EPWT Linux (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWT for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWT
- Attributes required: #EPWT with inactive processor cores
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQJ) - 1 core Base Proc Act (Pools 2.0) for #EPWY Linux (from Static)

Each occurrence of this feature will permanently activate one Base processor core on Processor Card #EPWY for Pools 2.0

- Attributes provided: One Base processor core activation (Pools 2.0) for #EPWY
- Attributes required: #EPWY with inactive processor cores
- Minimum required: 0
- Maximum allowed: 44 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQK) - 1GB Base Memory activation (Pools 2.0) from Static

This feature delivers 1 GB Base Memory only for Pools 2.0 on MR9

- Attributes provided: 1GB Base Memory Activation for Pools 2.0.
- Attributes required: Inactive Memory available for temporary use installed
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQL) - 100GB Base Memory activation (Pools 2.0) from Static

This feature delivers 100 GB Base Memory only for Pools 2.0 on MR9

- Attributes provided: 100GB Base Memory Activation for Pools 2.0.
- Attributes required: Inactive Memory available for temporary use installed
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQM) - 512GB Base Memory activation (Pools 2.0) convert from Linux only

This feature delivers 512 GB Base Memory for Pools 2.0 on MR9

- Attributes provided: 512GB Base Memory Activation for Pools 2.0
- Attributes required: Inactive Memory available for temporary use installed
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: No

(#EPQN) - 256GB Base Memory Activation for POOLS 2.0 - Linux only

This feature delivers 256 GB Base Memory for Pools 2.0 on MR9

- Attributes provided: 256GB Base Memory Activation for Pools 2.0 - Linux only
- Attributes required: Inactive Memory available for temporary use installed
- Minimum required: 0
- Maximum allowed: 254 (Initial order maximum: 254)
- OS level required:
- 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.

Not orderable in China and Hong Kong.

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.

Not orderable in China and Hong Kong.

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

(#EPVV) - 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. The processors on the system can be partitioned up to 20 LPARS per processor core. An encrypted key is supplied to the customer and installed on the system, authorizing the partitioning at the sub-processor level.

Included with Feature EPVV is the IBM Virtual I/O Server and Live Partition Mobility, which allows for the movement of a logical partition from one POWER8 processor-based server to another with no application downtime. to provide additional virtualization function.

- Attributes provided: System virtualization with Partition Mobility
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPWR) - 8-core Typical 3.6 to 3.8 GHZ (max) processor

Thirty-two core Typical 3.6 to 3.8 GHz (max) POWER9 processor planar containing four eight-core processor SCMs.

Each processor feature will deliver a set of four identical processors that populate all the sockets in a given system node. All processors in the system node must be identical. Activations are applied per core with a minimum of eight activation.

- Attributes provided: Four 8-core Typical 3.6 to 3.8 GHz (max) SCMs providing 32-core system node
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPWS) - 10-core Typical 3.4 to 3.8 GHZ (max) processor

Forty core Typical 3.4 to 3.8 GHz (max) POWER9 processor planar containing four eight-core processor SCMs.

Each processor feature will deliver a set of four identical processors that populate all the sockets in a given system node. All processors in the system node must be identical. Activations are applied per core with a minimum of eight activation.

- Attributes provided: Four 10-core Typical 3.4 to 3.8 GHz (max) SCMs providing 40-core system node
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPWT) - 12-core Typical 3.15 to 3.8 GHZ (max) processor

Forty-eight core Typical 3.15 to 3.8 GHz (max) POWER9 processor planar containing four eight-core processor SCMs.

Each processor feature will deliver a set of four identical processors that populate all the sockets in a given system node. All processors in the system node must be identical. Activations are applied per core with a minimum of eight activation.

- Attributes provided: Four 12-core Typical 3.15 to 3.8 GHz (max) SCMs providing 48-core system node
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EPWV) - 1-core Processor Activation for #EPWR

- Minimum required: 0
- Maximum allowed: 32 (Initial order maximum: 32)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPWW) - 1-core Processor Activation for #EPWS

- Minimum required: 0
- Maximum allowed: 40 (Initial order maximum: 40)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPWX) - 1W Processor activation for #EPWT

- Minimum required: 0
- Maximum allowed: 48 (Initial order maximum: 48)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPWY) - 11-core Typical 3.2 to 3.8 GHZ (max) processor

Forty-four core Typical 3.2 to 3.8 GHz (max) POWER9 processor planar containing four eight-core processor SCMs.

Each processor feature will deliver a set of four identical processors that populate all the sockets in a given system node. All processors in the system node must be identical. Activations are applied per core with a minimum of eight activation.

- Attributes provided: Four 11-core Typical 3.2 to 3.8 GHz (max) SCMs providing 44-core system node
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels.
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EQ0Q) - Quantity 150 of #ES0Q 387GB SFF-2 4k SSD (AIX/Linux)

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: 5 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQ0S) - Quantity 150 of #ES0S 775GB SFF-2 4k SSD (AIX/Linux)

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: 5 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Supported
- 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: 5 (Initial order maximum: 0)
- 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: 5 (Initial order maximum: 0)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EQ77) - Qty 150 of #6577

This feature provides QTY 150 of #6577. FC 6577 is mandatory on factory rack integrated (4651-4666) orders. Feature is not valid on initial order with non-factory integrated feature 4650.

- Attributes provided: Power cable
- Attributes required: At least one Rack and the absence of #4650.
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Initial
- CSU: Yes
- Return parts MES: No

(#EQ78) - Quantity 150 of #ES78 387GB SFF-2 SSD 5xx

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: 5 (Initial order maximum: 0)
- OS level required: Refer to feature #ES78
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQ7E) - Quantity 150 of #ES7E 775GB SFF-2 SSD 5xx

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: 5 (Initial order maximum: 0)
- OS level required: Refer to feature #ES7E
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQ80) - Quantity 150 of #ES80 1.9TB SFF-2 SSD 4k

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: 5 (Initial order maximum: 0)
- OS level required:
  - See #ES80 for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- 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: 5 (Initial order maximum: 0)
- OS level required: Refer to feature #ES85
- Initial Order/MES/Both/Supported: Supported
- 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: 5 (Initial order maximum: 0)
- OS level required: Refer to feature #ES8C
- Initial Order/MES/Both/Supported: Supported
- 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: 5 (Initial order maximum: 0)
- OS level required: Refer to feature #ES8F
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQ8Y) - Quantity 150 of #ES8Y 931GB SFF-2 SSD 4k

(No longer available as of January 18, 2019)

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: 5 (Initial order maximum: 0)
- 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

(No longer available as of January 18, 2019)

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: 5 (Initial order maximum: 0)
- 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 or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQDP) - Quantity 150 of #ESDP (600GB 15K RPM SAS SFF-2 for AIX/LINUX)

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: 10 (Initial order maximum: 0)
- OS level required: N/A
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EQE7) - Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k

(No longer available as of January 18, 2019)

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: 5 (Initial order maximum: 5)
- 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: 10 (Initial order maximum: 10)
- OS level required: N/A
- 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 November 9, 2018)

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: 10 (Initial order maximum: 10)
- OS level required: N/A
- 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: 10 (Initial order maximum: 10)
- OS level required: N/A
- 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 November 9, 2018)

This 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: 10 (Initial order maximum: 10)
- OS level required: N/A
- 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: 10 (Initial order maximum: 10)
- OS level required: N/A
- 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: 5 (Initial order maximum: 0)
- OS level required: N/A
- 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: 5 (Initial order maximum: 0)
- OS level required: N/A
- 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: 5 (Initial order maximum: 0)
- OS level required: N/A
- 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: 5 (Initial order maximum: 0)
- OS level required: N/A
- 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: 5 (Initial order maximum: 0)
- OS level required: N/A
- 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 #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

(#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: 5 (Initial order maximum: 5)
- OS level required: see feature #ES94
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERF1) - RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs

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) eight 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 eight 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

(#ERG7) - Optional Origami Front Door for 2.0m Rack

#ERG7 provides an attractive black full height rack door on the #0553 & 7014-T42 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 for the 7014-T42 and #0553 2M rack.
- 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

(#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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESGV
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESGZ
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESJ0
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESJ2
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESJ4
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERJ6) - Quantity 150 of ESJ6 7.45TB SAS 4k

This feature ships a quantity of 150 #ESJ6 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 #ESJ6
- Attributes required: 150 SFF-2 SAS bays in expansion drawers
- Minimum required: 0
- Maximum allowed: 5 (Initial order maximum: 5)
- OS level required: see feature #ESJ6
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- 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: 5 (Initial order maximum: 5)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ERHN) - Quantity 150 of #ESHN 7.45 TB SSD 4k SFF-2

(No longer available as of August 30, 2019)

This feature ships a quantity of 150 #ESHN 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 #ESHN
- Attributes required: 150 SFF-2 SAS bays in EXP24S or EXP24SX drawers
- Minimum required: 0
- Maximum allowed: 5 (Initial order maximum: 5)
- OS level required: see feature ESHN
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESNA
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required: see feature #ESNE
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES0Q) - 387GB SFF-2 4K SSD for AIX/Linux

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 can not 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: 768 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES0S) - 775GB SFF-2 4k SSD for AIX/Linux

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 can not 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: 768 (Initial order maximum: 0)
- OS level required:
  - AIX supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#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: Cannot 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: 768 (Initial order maximum: 250)
- 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: Cannot 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: 768 (Initial order maximum: 250)
- 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/POWER9 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 cannot 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: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES7E) - 775GB SFF-2 SSD 5xx eMLC4 for AIX/Linux

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/POWER9 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 cannot 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: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES7K) - 387GB SFF-3 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-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/POWER9 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: 8 (Initial order maximum: 0)
- OS level required:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - AIX Supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES7P) - 775GB SFF-3 SSD 5xx eMLC4 for AIX/Linux

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/POWER9 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: 8 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES80) - 1.9TB Read Intensive SAS 4k SFF-2 SSD for AIX/Linux

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/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 can not 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: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#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/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: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES85) - 387GB SFF-2 SSD 4k eMLC4 for AIX/Linux

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.
- Limitation: 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/POWER9 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: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- 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

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.
- Limitation: 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/POWER9 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: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES8F) - 1.55TB SFF-2 SSD 4k eMLC4 for AIX/Linux

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.
- Limitation: 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/POWER9 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 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 1.55TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES8J) - 1.9TB Read Intensive SAS 4k SFF-3 SSD for AIX/Linux

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/POWER9 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/POWER9 system unit and controlled by the internal SAS control unit.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES8N) - 387GB SFF-3 SSD 4k eMLC4 for AIX/Linux

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.
- Limitation: 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 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: 8 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES8Q) - 775GB SFF-3 SSD 4k eMLC4 for AIX/Linux

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.
- Limitation: 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 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: 8 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ES8V) - 1.55TB SFF-3 SSD 4k eMLC4 for AIX/Linux

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.
- Limitation: 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 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: 8 (Initial order maximum: 0)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#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/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 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: 768 (Initial order maximum: 250)
- OS level required:
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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/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: 8 (Initial order maximum: 8)
- OS level required:
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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/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 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: 768 (Initial order maximum: 250)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported

- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported

- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported

- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX - supported
  - IBM i not supported
  - Linux - supported

  Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- 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: N/A
- Initial Order/MES/Both/Supported: Both
- CSU: N/A
- Return parts MES: Does not apply

(#ESC7) - S&H

Shipping and handling

- 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

(#ESD3) - 1.2TB 10K RPM SAS SFF-2 Disk Drive (AIX/Linux)

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: 1536 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.
- Initial Order/MES/Both/Supported: Supported
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESDP) - 600GB 15K RPM SAS SFF-2 Disk Drive - 5xx Block (AIX/Linux)

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: 1536 (Initial order maximum: 0)
- OS level required:
  - AIX - supported
  - Linux - supported

  Refer to the Software Requirements section to find the supported O/S levels for AIX and Linux.

- Initial Order/MES/Both/Supported: Supported
- 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/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: 8 (Initial order maximum: 8)
- OS level required:
- 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/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 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: 768 (Initial order maximum: 250)
- OS level required:
- 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: 1536 (Initial order maximum: 250)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- 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 November 9, 2018)

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/POWER9 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: 1536 (Initial order maximum: 250)
- OS level required:
  - Linux - supported
  - AIX - 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: 1536 (Initial order maximum: 250)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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/POWER9 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESFB) - 300GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive

(No longer available as of November 9, 2018)

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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESFF) - 600GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive

(No longer available as of November 9, 2018)

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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESFP) - 600GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive

(No longer available as of November 9, 2018)

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

Limitation:

- Cannot be used in POWER8/POWER9 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: 1536 (Initial order maximum: 250)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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: 1536 (Initial order maximum: 250)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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/POWER9 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux - supported
  - AIX - supported
  - Refer to Software Requirements for specific O/S levels supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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/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 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 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- 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/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 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 387 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- 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/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 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 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- 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/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 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 387 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- 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/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 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 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- 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/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 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 775 GB SFF-3 5xx SSD
- Attributes required: SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- 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/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 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 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- 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/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 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 775 GB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- 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/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 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 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- 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/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 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 1.55 TB SFF-3 4k SSD
- Attributes required: one SFF-3 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux supported
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJ6) - 7.45TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

7.45 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 #ESJ6 and #ESJ7 are physically identical drives with the same 5B2F CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJ6 indicates usage by AIX, Linux or VIOS. #ESJ7 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/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: 7.45 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJE) - 7.45TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

7.45 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 #ESJE and #ESJF are physically identical drives with the same 5B2E CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJE indicates usage by AIX, Linux or VIOS. #ESJF 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/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: 7.45 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJJ) - 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 #ESJJ and #ESJK are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJJ indicates usage by AIX, Linux or VIOS. #ESJK 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJL) - 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 #ESJL and #ESJM are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJL indicates usage by AIX, Linux or VIOS. #ESJM 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJN) - 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 #ESJN and #ESJP are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJN indicates usage by AIX, Linux or VIOS. #ESJP 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: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJQ) - 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

7.44 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
7.44 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 #ESJQ and #ESJR are physically identical drives with the same 5B2F CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJQ indicates usage by AIX, Linux or VIOS. #ESJR 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/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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJS) - 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 #ESJS and #ESJT are physically identical drives with the same 5B2B CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJS indicates usage by AIX, Linux or VIOS. #ESJT 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJU) - 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 #ESJU and #ESJV are physically identical drives with the same 5B20 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJU indicates usage by AIX, Linux or VIOS. #ESJV 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJW) - 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 #ESJW and #ESJX are physically identical drives with the same 5B2C CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJW indicates usage by AIX, Linux or VIOS. #ESJX 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: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESJY) - 7.44TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

7.44 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
7.44 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 #ESJY and #ESJZ are physically identical drives with the same 5B2E CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESJY indicates usage by AIX, Linux or VIOS. #ESJZ 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/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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
  - Linux supported
  - AIX supported
- Initial Order/MES/Both/Supported: Both
- 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 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: 768 (Initial order maximum: 250)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESHL) - 1.86 TB Mainstream SAS 4k SFF-2 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-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 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: 768 (Initial order maximum: 250)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESHN) - 7.45 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of August 30, 2019)

7.45 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.

#ESHN has 5B2F CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHN indicates usage by AIX, Linux or VIOS.
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/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 cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 7.45 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 768 (Initial order maximum: 250)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESHS) - 931 GB Mainstream SAS 4k SFF-3 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-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: 8 (Initial order maximum: 8)
- OS level required:
- 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: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESHW) - 7.45 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux

(No longer available as of August 30, 2019)

7.45 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 #ESHW has 5B2E CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESHW indicates usage by AIX, Linux or VIOS.
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/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: 7.45 TB Mainstream SSD
- Attributes required: Open SFF-3 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 64 (Initial order maximum: 64)
- OS level required:
- 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 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 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/POWER9 Scale-out server such as the Power S814, S822, S824, S914, S922, S924, H922, or H924. 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/ POWER9 generation); 2U 19-inch rack space; Appropriate SAS cables
- Minimum required: 0
- Maximum allowed: 64 (Initial order maximum: 64)
- 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

(#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/POWER9 Scale-out server such as the Power S814, S822, S824, S914, S922, S924, H922, or H924. 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/ POWER9 generation); 2U 19-inch rack space; Appropriate SAS cables

- Minimum required: 0
- Maximum allowed: 64 (Initial order maximum: 64)
- 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

(#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 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: 768 (Initial order maximum: 250)
- OS level required:
- 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

(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-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: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNA) - 775GB 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 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 768 (Initial order maximum: 250)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
  - AIX supported
  - Linux supported
- Initial Order/MES/Both/Supported: Both
- 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: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES:

(#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: 1536 (Initial order maximum: 250)
- OS level required:
  - IBM i - not 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: 8 (Initial order maximum: 8)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES:

(#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: 1536 (Initial order maximum: 250)
- OS level required:
  - IBM i - not 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: 10 (Initial order maximum: 10)
- OS level required: see feature ESNM
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES:

(#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: 10 (Initial order maximum: 10)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES:

(#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: 5 (Initial order maximum: 5)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 5 (Initial order maximum: 5)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- 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: 6 (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: Assignment to the VIOS supported

(#EU08) - RDX 320 GB Removable Disk Drive

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:
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES:

(#EU15) - 1.5TB Removable Disk Drive Cartridge

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:
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES:

(#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

(#EUA5) - Standalone USB DVD drive w/cable

The Standalone USB DVD drive (FC EUA5) is an optional, standalone external USB-DVD device. It requires high current at 5V and must use the front USB 3.0 port on the 9008-22L, 9009-22A, 9009-41A, 9009-42A, 9223-22H, and 9223-42H systems.

- Custom card identification number (CCIN): 6331 model 005
- Media: Reads CD-ROM, CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-ROM, and DVD-RAM discs; Writes 4.7 GB DVD-RAM discs; CD read speed at 24X; DVD-ROM read speed at 8X; DVD-RAM at 5X; DVD-RAM has a write speed of 5X; The buffer size is 0.75 MB and cannot be disabled.
- Interface: USB
- Connector: USB 2.0
- Loading tray: supports 12 cm and 8 cm discs floor) Note: A USB extension cable is included (P/N 32N1311). The USB extension cable is to be used when there are no safe, flat spots available in the rack. This cable allows the drive to reach the floor. Alternate or additional extension cables are not supported as the total USB cable length can be no longer than 3 meters.
- Form factor: standalone USB DVD drive
- DVD video: not supported
- Attributes provided: USB DVD drive
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- 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:
  Note: Assignment to the VIOS supported

(#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

(#MMCB) - ECOD GB Memory Day - AIX/Linux

(No longer available as of July 23, 2019)

Delivers 8 GB of Elastic CoD Memory per day for every #MMCB feature code ordered. After usage of this feature has been exhausted, additional temporary usage of Elastic CoD memory resources may be activated by ordering another Elastic CoD feature code, #MMBT. The maximum Elastic proc-days billable on any one order is 9,999.

- Attributes provided: This feature provides 8 GB of Elastic COD memory for 1 day
- Attributes required: Inactive CoD Memory
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum:)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply

(#MMCY) - ECOD Processor Day - AIX/Linux

(No longer available as of July 23, 2019)

A quantity of one of feature code #MMCY provides access to one Elastic CoD processor core running either AIX or Linux for 1 day. Access to these resources is measured in twenty-four hour periods. The maximum Elastic proc-days billable on any one order is 9,999.

- Attributes provided: This feature provides access to one inactive Elastic CoD processor resources for 1 day
- Attributes required: Inactive CoD processor cores.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum:)
- OS level required:
- Initial Order/MES/Both/Supported: MES
- CSU: Yes
- Return parts MES: Does not apply

(#SVPC) - 5000 Power to Cloud Reward points

The IBM Power to Cloud Reward Program is designed to accelerate the transformation of your IT infrastructure to private and hybrid cloud, by helping you design, build and deliver a cloud platform on IBM Power Systems servers with help from IBM Systems Lab Services.

You can earn reward points on select purchases of IBM Power Systems servers. Reward points can be used for a range of services focused on helping the transition from traditional IT platforms to private and hybrid cloud platforms by leveraging the proven expertise of IBM Systems Lab Services consultants.

For additional details, visit ibm.biz/PowertoCloud

This feature is ONLY for new initial orders or MES upgrades from POWER8 to POWER9. It DOES NOT allow loose part MES on POWER9

- Attributes provided: 5,000 Power to Cloud Reward points
- 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

Back to top

Accessories

None.

Customer replacement parts

None.

Back to top

Supplies

None.

Supplemental media

None.

Back to top

Trademarks

(R), (TM), * Trademark or registered trademark of International Business Machines Corporation.

** Company, product, or service name may be a trademark or service mark of others.

Terms of use