

Family 9105+04 IBM Power S1014 (9105-41B)

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Product life cycle dates

Type Model	Announced	Available	Marketing Withdrawn	Service Discontinued
9105-41B	2022-07-12	2022-07-22	-	-

Abstract

Security, operational efficiency, and real-time intelligence to respond quickly to market changes are now nonnegotiable for IT. In an always-on environment of constant change, you need to automate and accelerate critical operations, while ensuring 24x7 availability and staying ahead of cyberthreats. You need applications and data to be enterprise-grade everywhere, but without adding complexity and cost.

The Power S1014 (9105-41B) server can modernize your applications and infrastructure with a frictionless hybrid cloud experience to provide the agility you need for the unpredictability of today's business. The Power S1014 can help you:

- Run workloads where you need them with efficient scaling and consistent pay-for-use consumption across public and private clouds
- Use memory encryption at the processor level designed to support Zero Trust security approach to hybrid cloud
- Accelerate insights from data through AI inferencing directly in the core
- Consolidate workloads with scalability and performance that can reduce energy consumption

The Power S1014 server can help deliver business agility by extending mission-critical workloads across a hybrid cloud with increased flexibility.

- **Respond faster to business demands:** The Power10 processor delivers new levels of performance as compared to IBM Power9 for the same workloads without increasing energy or carbon footprint, enabling more efficient scaling.

- **Protect data from core to cloud:** Power10 provides end- to-end security with a transparent memory encryption at the processor level--without management overhead or performance impact. Power10 can also help you to stay ahead of future threats with support for post- quantum cryptography and fully homomorphic encryption.
- **Streamline insights and automation:** Power10 leverages the enhanced in-core AI inferencing capability built into every server with no additional specialized hardware required. You can extract insights from your most sensitive data where it resides, eliminating the time and risk of data movement.
- **Maximize availability and reliability:** The Power10 processor ensures your business stays up and running with inherent advanced recovery and self-healing features for infrastructure redundancy and disaster recovery in IBM Cloud.

Power servers are delivering results for clients all over the globe, from new digital services for banks and real-time decision- making in manufacturing to operational efficiency for engineering and electronics. See how Power servers are contributing to IBM client success in [IBM Case Studies](#).

In 1992 IBM was a founding partner of the U.S. Environmental Protection Agency (EPA) ENERGY STAR program and we continue to certify applicable products. IBM intends to certify all products that are in scope of the U.S. EPA ENERGY STAR for Computer Servers program.

Model abstract 9105-41B [🔗](#)

The IBM Power S1014 (9105-41B) server is a high-performance, flexible one-socket, 4U system that provides massive scalability and flexibility. It delivers extreme density in an energy-efficient design with best-in-class reliability and resiliency. The IBM Power S1014 server brings a secure environment that balances mission- critical traditional workloads and modernization applications to deliver a frictionless hybrid cloud experience.

Highlights [🔗](#)

IBM Power servers are already the most reliable and secure in their class. Now, the new IBM Power S1014 (9105-41B) technology-based server extends that leadership and introduces the essential scale-out hybrid cloud platform, uniquely architected to help clients securely and efficiently scale core operational and AI applications anywhere in a hybrid cloud. Clients can encrypt all data simply without management overhead or performance impact and drive insights faster with AI at the point of data. Clients can also gain workload deployment flexibility and agility with a single hybrid cloud currency while doing more work.

Power S1014 features include:

- IBM Power10 processors with up to four, eight, or twenty-four total cores per server
- In-core AI inferencing and machine learning with Matrix Math Accelerator (MMA) feature
- Up to 1.0 TB of system memory distributed across 8 DDR4/DDR5 differential dual inline memory module (DDIMM) slots
- Transparent Memory Encryption with no additional management setup and no performance impact

- Five PCIe slots with four PCIe Gen5 capable, all with concurrent maintenance
- Up to 16 NVMe U.2 flash bays provides up to 102.4 TB of high-speed storage
- Optional internal RDX drive
- 1+1 redundant hot-plug 200--240 volt AC titanium power supplies in each enclosure supporting a rack configuration, or
- 1+1 or 2+2 redundant hot-plug 100--127/200--240 volt AC titanium power supplies in each enclosure supporting a rack or tower/desk configuration
- IBM PowerVM-integrated virtualization with minimum processing overhead

The Power S1014 supports:

- IBM AIX, IBM i, Linux, and VIOS environments
- IBM Power Expert Care service tiers
- IBM i Solution Edition for Power S1014
- IBM i Express Edition for Power S1014

Description

The Power S1014 (9105-41B) server is a high-performance, flexible, one-socket, 4U system that provides massive scalability and flexibility. It delivers extreme density in an energy-efficient design with superior reliability and resiliency. The Power S1014 server brings a secure environment that balances mission-critical traditional workloads and modernization applications to deliver a frictionless hybrid cloud experience.

Power S1014 feature summary

- One entry single-chip processor module per system server:
 - 3.0--3.90 GHz, four-core Power10 processor (#EPG0).
 - 3.0--3.90 GHz, eight-core Power10 processor (#EPG2).
- One dual-chip processor module per system server:
 - 2.75--3.90 GHz, 24-core Power10 Processor (#EPH8).
- MMA feature helps to perform in-core AI inferencing and machine learning where data resides.
- Up to 1 TB of system memory distributed across 8 DDIMM slots per system server. DDIMMs are extremely high-performance, high-reliability, intelligent, and dynamic random access memory (DRAM) devices.
- DDR4 DDIMM memory cards:
 - 32 GB (2 x 16 GB), (#EM6N).
 - 64 GB (2 x 32 GB), (#EM6W).
 - 128 GB (2 x 64 GB), (#EM6X).
 - 256 GB (2 x 128 GB), (#EM6Y).
- DDR5 DDIMM memory cards:
 - 64 GB (2 x 32 GB), (#EMFA)
 - 128 GB (2 x 64 GB), (#EMFB)
 - 256 GB (2 x 128 GB), (#EMFD)
- PCIe slots:
 - One x16 Gen4 or x8 Gen5 full-height, half-length slot.

- Three x8 Gen5 full-height, half-length slots (with x16 connectors).
- One x8 Gen4 full-height, half-length slot (with x16 connectors).
- All PCIe slots are concurrently maintainable.
- Integrated:
 - System management using an Enterprise Baseboard Management Controller (eBMC).
 - EnergyScale technology.
 - Redundant hot-swap cooling.
 - Redundant hot-swap AC power supplies.
 - Up to two HMC 1 GbE RJ45 ports.
 - One rear USB 3.0 port.
 - One front USB 3.0 port.
 - One internal USB 3.0 Port for RDX.
 - Nineteen-inch rack-mounting hardware (4U).
- Optional PCIe I/O expansion drawer with PCIe slots -- Rack configuration only:
 - One PCIe Gen3 I/O Expansion Drawer (#EMX0).
 - I/O drawer holds one six-slot PCIe fanout modules (#EMXH).
 - Fanout module attaches to the system node through a PCIe optical or copper cable adapter (#EJ2A).

PowerVM

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

Processor modules

The Power10 processor is the compute engine for the next generation of Power systems and successor to the current IBM Power9 processor. It offers superior performance on applications such as MMA facility to accelerate computation-intensive kernels, matrix multiplication, convolution, and discrete Fourier transform. To efficiently accelerate MMA operations, the Power10 processor core implements a dense math engine (DME) microarchitecture that effectively provides an accelerator for cognitive computing, machine learning, and AI inferencing workloads.

A maximum of one Power10 processor is allowed. The following defines the allowed quantities of processor activation entitlements:

- One four-core, typical 3.0 to 3.90 GHz (max) processor (#EPG0) requires that four processor activation codes be ordered. A maximum of four processor activations (#EPFT) are allowed.
- One eight-core, typical 3.0 to 3.90 GHz (max) processor (#EPG2) requires that eight processor activation codes be ordered. A maximum of eight processor activation code features (#EPF6) are allowed.
- One twenty-four, typical 2.75 to 3.90 GHz (max) dual-chip processor module (#EPH8) requires that twenty-four processor activation codes be ordered. A maximum of twenty-four processor activation code features (#EPFZ) are allowed.

Enhanced Workload Optimized Frequency for optimum 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 Power10 Processor-Based Systems website](#).

MMA

The Power10 processor core inherits the modular architecture of the Power9 processor core, but the redesigned and enhanced microarchitecture significantly increases the processor core performance and processing efficiency. The peak computational throughput is markedly improved by new execution capabilities and optimized cache bandwidth characteristics. Extra matrix math acceleration engines can deliver significant performance gains for machine learning, particularly for AI inferencing workloads.

Memory

The Power S1014 server uses the next-generation DDIMMs, which are high-performance, high-reliability, high-function memory cards that contain a buffer chip, intelligence, and 2666 MHz or 3200 MHz DRAM memory. DDIMMs are placed in DDIMM slots in the server system.

- A minimum 32 GB of memory is required with one processor module. All Memory DIMMs must be ordered in pairs.
- Each DIMM feature code delivers two physical Memory DIMMs.

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

To assist with the plugging rules, two DDIMMs are ordered using one memory feature number. Select from:

- 32 GB (2 x 16 GB) DDIMMs, 3200 MHz, 8 Gb DDR4 Memory (#EM6N)
- 64 GB (2 x 32 GB) DDIMMs, 3200 MHz, 8 Gb DDR4 Memory (#EM6W)
- 64 GB (2 x 32 GB) DDIMMs, 3200 MHz, 16 Gb DDR5 Memory (#EMFA)
- 128 GB (2 x 64 GB) DDIMMs, 3200 MHz, 16 Gb DDR4 Memory (#EM6X)
- 128 GB (2 x 64 GB) DDIMMs, 3200 MHz, 16 Gb DDR5 Memory (#EMFB)
- 256 GB (2 x 128 GB) DDIMMs, 2666 MHz, 16 Gb DDR4 Memory (#EM6Y)
- 256 GB (2 x 128 GB) DDIMMs, 3200 MHz, 16 Gb DDR5 Memory (#EMFD)

AMM

AMM for Hypervisor is available as an option (#EM8G) to enhance resilience by mirroring critical memory used by the PowerVM hypervisor so that it can continue operating in the event of a memory failure. A portion of available memory can be proactively partitioned such that a duplicate set may be utilized upon non-correctable memory errors. This can be implemented at the granularity of DIMMs or logical memory blocks.

PowerVM Enterprise Edition

PowerVM Enterprise Edition License Entitlement is included with each Power S1014 server.

PowerVM Enterprise Edition is available as a hardware feature (#5228) and supports up to 20 virtual machines (VMs) per core, VIOS, and multiple shared processor pools. It also offers Live Partition Mobility (LPM) and Active Memory Expansion, with Active Memory Management as an option.

Other PowerVM technologies include:

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

LPM allows the movement of a running AIX, IBM i, or Linux VM from one physical server to another without downtime. This capability can be used 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 workloads to new Power10 systems for upgrades without scheduling an outage.

Active Memory Expansion (#EMBP)

AME 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 or 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.

AME uses CPU resource to compress or 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 or decompression.

Power10 chips include a hardware accelerator designed to boost AME efficiency and use less Power core resource. The Power10 accelerator includes some minor enhancements and also leverages Power10 higher bandwidth and lower latency characteristics.

You have a great deal of control over AME usage. Each individual AIX partition can turn on or turn off AME. Control parameters set the amount of expansion desired in each partition to help control the amount of CPU used by the AME 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 Power model can run the planning tool. In addition, a one-time, 60-day trial of AME is available to enable more exact memory expansion and CPU measurements. You can request the trial using the Power Capacity on Demand website.

AME is enabled by chargeable hardware feature (#EMBP), 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 AME. Normal licensing requirements apply.

Power S1014 Capacity Backup (CBU) for IBM i

The Power S1014 CBU designation enables you to temporarily transfer IBM i processor license entitlements and IBM i user license entitlements purchased for a primary machine to a secondary CBU-designated system for high availability (HA) and disaster recovery (DR) operations. Temporarily transferring these resources instead of purchasing them for your secondary system may result in significant savings. Processor activations cannot be transferred.

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

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

Before you can temporarily transfer IBM i processor license entitlements from the registered primary system, you must have more than one IBM i processor license on the primary machine and at least one IBM i processor license on the CBU server. To be in compliance, the CBU will be configured in a such a manner that there will be no out-of-compliance messages prior to a failover. An activated

processor must be available on the CBU server to use the transferred entitlement. You can then transfer any IBM i processor entitlements above the minimum one, assuming the total IBM i workload on the primary system does not require the IBM i entitlement you would like to transfer during the time of the transfer. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor license entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. These warning messages in this situation do not mean you are not in compliance. Prior to a temporary transfer, the CBU will be configured in such a manner that there will be no out of compliance warning messages.

Before you can temporarily transfer IBM i user entitlements, you must have more than the minimum number of IBM i user entitlements on a primary server. You can then transfer any IBM i user entitlements above the minimum, assuming the total IBM i users on the primary system do not require the IBM i entitlement you want to transfer during the time of the transfer.

The servers with P20 or higher software tiers do not have user entitlements that can be transferred, and only processor license entitlements can be transferred.

For a Power S1014 (with 8-cores) CBU which is in the P10 software tier, the following are eligible primary systems:

- Power S1024 (9105-42A) with 48-, 32-, 24-, or 12-cores
- Power S1022 (9105-22A) with 40-, 32-, 24-, or 12-cores
- Power S1022s (9105-22B) with 16-, or 8-cores
- Power S1014 (9105-41B) with 8-cores
- Power S924 (9009-42G)
- Power S924 (9009-42A)
- Power S922 (9009-22A)
- Power S922 (9009-22G) with minimum of 8-cores
- Power S914 (9009-41A) with minimum of 6-cores
- Power S914 (9009-41G) with minimum of 6-cores

The primary machine must be in the same enterprise as the CBU system. The IBM i Solution Editions are not eligible for CBU status.

For a Power S1014 (with 4-cores) CBU which is in the P05 software tier, the following are eligible primary systems:

- Power S1014 (9105-41B) with maximum of 4-cores
- Power S914 (9009-41A) with maximum of 4-cores
- Power S914 (9009-41G) with maximum of 4-cores
- Power S1022s (9105-22B) with 16 or 8 cores
- Power S1014 (9105-41B) with 8 cores
- Power S924 (9009-42G)
- Power S924 (9009-42A)
- Power S922 (9009-22A)
- Power S922 (9009-22G) with minimum of 8 cores
- Power S914 (9009-41A) with minimum of 6 cores
- Power S914 (9009-41G) with minimum of 6 cores

Power S1014 software (SW) tiers for IBM i on 9105-41B

- The four-core processor server (#EPG0, QPRCFEAT EPG0) is IBM i SW tier P05.
- The eight-core processor server (#EPG2, QPRCFEAT EPG2) is IBM i SW tier P10.

During the temporary transfer, the CBU system's internal records of its total number of IBM i processor entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. Prior to a temporary transfer, the CBU will be configured in such a manner that there are no out of compliance warning messages.

If your primary or CBU machine is sold or discontinued from use, any temporary entitlement transfers must be returned to the machine on which they were originally acquired. For CBU registration, terms and conditions, and further information, see the [IBM Power Systems: Capacity BackUp](#) website.

Four-core Power S1014 processor

The four-core Power S1014 server offers clients running AIX, IBM i, or Linux an entry-level server based on Power10 technology. It uses a typical 3.0 to 3.90 GHz (max) Power10 Processor Card (#EPG0) with processor core activation feature (#EPFT). All four processor cores must be activated, but factory deconfiguration feature 2319 is supported. The chargeable feature EPFT is used for these activations. The four-core Power S1014 server with IBM i operating system supports a maximum system memory of 64 GB. The four-core Power S1014 server has five PCIe slots, four Gen5 capable.

There is no upgrade to increase the cores on this feature. This server supports AIX, IBM i, and Linux, but it is especially attractive to IBM i clients with its P05 software tier.



Note: For Italy, the maximum number of IBM i users is 40.

If IBM i is selected as an operating system

The Capacity Backup option for IBM i (#0444) is supported. The four-core S1014 server supports a maximum of 6.4 TB of NVMe storage using two to eight mirrored NVMe PCIe devices and no SAS drives are allowed. This is true with the storage backplane option #EJ1Y. The PCIe Expansion Drawer (#EMX0) and EXP24SX SAS Storage Enclosures (#ESLS) are not allowed with the four-core processor card (#EPG0) configuration Power S1014 server when IBM i is selected as an operating system. Attachment to SANs is supported.

Maximum NVMe (U.2 and add-in card) capacities are restricted as showed in the table below:

PCIe	System	Notes
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NVMe	maximum	
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device		
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capacity		
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800 GB	8	Mixing with other NVMe devices is allowed in pairs but cannot exceed the maximum capacity of 3.2 TB mirrored (total capacity 6.4 TB).
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1.6 TB	4	Mixing with other NVMe devices is allowed in pairs but cannot exceed the maximum capacity of 3.2 TB mirrored (total capacity 6.4 TB).
3.2 TB	2	Mixing with other NVMe devices is not allowed.

i **Note:** Table 1 - IBM i PCIe NVMe maximum capacities.

The following NVMe devices for IBM i are supported in the NVMe bays of the four-core Power S1014 system unit:

NVMe PCIe devices

- 800 GB (#ES3A) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 800 GB (#ES1K) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 1.6 TB (#ES3C) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 1.6 TB (#EC6V) - PCIe3 x8 NVMe Flash Adapter for IBM i
- 1.6 TB (#EC7K) - PCIe4 x8 NVMe Flash Adapter for IBM i
- 1.6 TB (#ES1F) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 3.2 TB (#ES3E) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 3.2 TB (#ES1H) - PCIe4 NVMe U.2 Enterprise module for IBM i
- 3.2 TB (#EC6X) - PCIe3 x8 NVMe Flash Adapter for IBM i
- 3.2 TB (#EC7M) - PCIe4 x8 NVMe Flash Adapter for IBM i

Other NVMe PCIe devices or SAS drives not in the list above are not supported.

The PCIe Expansion Drawer (#EMX0) and EXP24SX SAS Storage Enclosures (#ESLS) are not allowed with the four-core processor card (#EPG0) configuration Power S1014 server when IBM i is selected as an operating system.

The CBU specify feature (#0444) is supported with the four-core processor card (#EPG0) in IBM i environments. With its P05 software, it can be paired with an Power9 server with P05 or P10 software tier.

When AIX, Linux, or VIOS are selected and no IBM i is selected

If AIX, Linux, or VIOS is the only operating system on the system, then all orderable and supported SAS drives and NVMe devices for AIX or Linux are allowed.

IBM i Solution Edition for Power S1014

The IBM i Solution Edition is designed to help you take advantage of the combined experience and expertise of IBM and Independent Software Vendors (ISVs) in building business value with your IT investments. A qualifying purchase of software, maintenance, services, or training for a participating ISV solution is required when purchasing an IBM i Solution Edition.

The Power S1014 Solution Edition feature 4928 supports four-core configurations. For a list of participating ISVs, registration form, and additional details, see the [IBM i Solution Editions](#) website.

IBM i Express Edition for Power S1014

IBM i clients acquiring a new four-core Power S1014 server can choose to use an IBM i Express Edition. New edition is similar to the edition provided with Power9 servers and offer specific licensing advantages that further improve the price and performance of the Power S1014 server when running IBM i. Feature EU2C can be included with a new four-core Power S1014 server.

Titanium power supply

Titanium power supplies are designed to meet the latest efficiency regulations.

- Two titanium power supplies (feature EB3W) supporting a rack or tower/desk: 1+1 1200 watt 100-127/200--240 volt , or
- Two titanium power supplies (feature EB3S) supporting a rack: 1+1 1600 watt 200--240 volt (mandatory for 24-core Processor feature EPH8), or
- Four titanium power supplies (feature EB3W) supporting a rack or tower/desk: 2+2 1200 watt 100-127/200--240 volt

Redundant fans

Redundant fans are standard.

Power cords

Four power cords or two power cords are required. The Power S1014 server supports power cord 4.3-meter (14-foot), drawer to wall/IBM PDU (250V/10A) in the base shipment group. See the feature listing for other options.

PCIe slots

The Power S1014 server has up to sixteen U.2 NVMe devices and up to five PCIe hot-plug slots with concurrent maintenance, providing excellent configuration flexibility and expandability. For more information about PCIe slots, see the rack-integrated system with I/O expansion drawer section below.

With one Power10 processor, five PCIe slots are available:

- One PCIe x16 Gen4 or x8 Gen5, full height, half length slot
- Three PCIe x8 (x16 connector) Gen5, full height, half length slots
- One PCIe x8 (x16 connector) Gen4, full height, half length slot

The x16 slots can provide up to twice the bandwidth of x8 slots because they offer twice as many PCIe lanes. PCIe Gen5 slots can support up to twice the bandwidth of a PCIe Gen4 slot, and PCIe Gen4 slots can support up to twice the bandwidth of a PCIe Gen3 slot, assuming an equivalent number of PCIe lanes.

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

These servers are smarter about energy efficiency when cooling the PCIe adapter environment. They sense which IBM PCIe adapters are installed in their PCIe slots and, if an adapter requires higher levels of cooling, they automatically speed up fans to increase airflow across the PCIe adapters. Note that faster fans increase the sound level of the server. Higher wattage PCIe adapters include the PCIe3 SAS adapters and SSD/flash PCIe adapters (#EJ10, #EJ14, and #EJ0J).

NVMe drive slots, RDX bay, and storage backplane options

NVMe SSDs, in the 15-millimeter carrier U.2 2.5-inch form factor, are used for internal storage in the Power S1014 system. The Power S1014 supports up to 16 NVMe U.2 devices when two storage backplanes with eight NVMe U.2 drive slots (#EJ1Y) are ordered. Both the 7-millimeter and 15-millimeter NVMe are supported in the 15-millimeter carrier.

The Power S1014 also supports an internal RDX drive attached through the USB controller.

Cable management arm

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

Integrated I/O ports

There are two HMC ports, one USB 3.0 port internal only for RDX attach, and two USB 3.0 ports. The two HMC ports are RJ45, supporting 1 Gb Ethernet connections. The eBMC USB 2.0 port can be used for communication to an Uninterrupted Power Supply (UPS) or code update.

Rack-integrated system with I/O expansion drawer

Regardless of the rack-integrated system to which the PCIe Gen3 I/O expansion drawer is attached, if the expansion drawer is ordered as factory integrated, the PDUs in the rack will be placed horizontally by default to enhance cable management.

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

After the rack with expansion drawers is delivered, you can rearrange the PDUs from horizontal to vertical. However, the configurator will continue to consider the PDUs as being placed horizontally for the matter of calculating the free space still available in the rack.

Vertical PDUs can be used only if CSRP (#0469) is on the order. When specifying CSRP, you must provide the locations where the PCIe Gen3 I/O expansion drawers should be placed. Note that you must avoid locating the drawers adjacent to vertical PDU locations EIA 6 through 16 and 21 through 31.

The I/O expansion drawer can be migrated from a Power9 to a Power10 processor-based system. Only I/O cards supported on Power10 in the I/O expansion drawer are allowed. Clients migrating the

I/O expansion drawer configuration might have one or two PCIe3 6-slot fanout modules (#EMXH) installed in the rear of the I/O expansion drawer.

For a 4U server configuration with one processor module, up to one I/O expansion drawer (#EMX0) and one fanout module (#EMXH) connected to one PCIe x16 to CXP Converter Card Adapter (#EJ2A) are supported. The other PCIe module bay must be populated by a filler module.

Limitations:

- Mixing of prior PCIe3 fanout modules (#EMXF or #EMXG) with PCIe3 fanout modules (#EMXH) in the same I/O expansion drawer is not allowed.
- PCIe x16 to CXP Converter Card Adapter (#EJ2A) requires one PCIe3 x16 slot in system unit plus a pair of optical cables (such as feature ECCX or feature ECCY) or copper cables (such as feature ECCS).

RDX docking station

The RDX docking station accommodates RDX removable disk cartridges of any capacity. The disk is in a protective rugged cartridge enclosure that plugs into the docking station. The docking station holds one removable rugged disk drive or cartridge at a time. The rugged removable disk cartridge and docking station performs saves, restores, and backups similar to a tape drive. This docking station can be an excellent entry capacity and performance option.

EXP24SX SAS storage enclosure

The EXP24SX is a storage expansion enclosure with 24 2.5-inch SFF SAS bays. It supports up to 24 hot-plug HDDs or SSDs in only 2 EIA of space in a 19-inch rack. The EXP24SX SFF bays use SFF Gen2 (SFF-2) carriers or trays.

The EXP24SX drawer feature ESLS is supported on the Power10 scale-out servers by AIX, IBM i, Linux, and VIOS.

With AIX, Linux, or 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, only one set of 24 bays (mode 1) is supported. It is possible to change the mode setting in the field using software commands along with a specifically documented procedure.

Important : When changing modes, a skilled, technically qualified person should follow the special documented procedures. 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 reconfiguration work.

Four mini-SAS HD ports on the EXP24SX are attached to PCIe Gen3 SAS adapters or attached to an integrated SAS controller in a Power10 scale-out server. The following PCIe3 SAS adapters support the EXP24SX:

- PCIe3 RAID SAS Adapter Quad-Port 6 Gb x8 (#EJ0J)
- PCIe3 12 GB Cache RAID Plus SAS Adapter Quad-Port 6 Gb x8 (#EJ14)
- PCIe3 LP RAID SAS Adapter Quad-Port 6 Gb x8 (#EJ0M)

Earlier-generation PCIe2 or PCIe1 SAS adapters are not supported with the EXP24SX.

The attachment between the EXP24SX and the PCIe3 SAS adapters or integrated SAS controllers is through SAS YO12 or X12 cables. X12 and YO12 cables are designed to support up to 12 Gb SAS. The PCIe Gen3 SAS adapters support up to 6 Gb throughput. The EXP24SX has been designed to support up to 12 Gb throughput if future SAS adapters support that capability. All ends of the YO12 and X12 cables have mini-SAS HD narrow connectors. Cable options are:

- X12 cable: 3-meter copper (#ECDJ), 4.5-meter optical (#ECDK), 10-meter optical (#ECDL)
- YO12 cables: 1.5-meter copper (#ECDT), 3-meter copper (#ECDU)
- 1M 100 GbE Optical Cable QSFP28 (AOC) (#EB5K)
- 1.5M 100 GbE Optical Cable QSFP28 (AOC) (#EB5L)
- 2M 100 GbE Optical Cable QSFP28 (AOC) (#EB5M)
- 3M 100 GbE Optical Cable QSFP28 (AOC) (#EB5R)
- 5M 100 GbE Optical Cable QSFP28 (AOC) (#EB5S)
- 10M 100 GbE Optical Cable QSFP28 (AOC) (#EB5T)
- 15M 100 GbE Optical Cable QSFP28 (AOC) (#EB5U)
- 20M 100 GbE Optical Cable QSFP28 (AOC) (#EB5V)
- 30M 100 GbE Optical Cable QSFP28 (AOC) (#EB5W)
- 50M 100 GbE Optical Cable QSFP28 (AOC) (#EB5X)

An AA12 cable interconnecting a pair of PCIe3 12 GB cache adapters (two #EJ14) is not attached to the EXP24SX. These higher-bandwidth cables could support 12 Gb throughput if future adapters support that capability. Copper feature ECE0 is 0.6 meters long, feature ECE3 is 3 meters long, and optical AA12 feature ECE4 is 4.5 meters long.

One no-charge specify code is used with each EXP24SX I/O Drawer (#ESLS) to communicate to IBM configurator tools and IBM Manufacturing which mode setting, adapter, and SAS cable are needed. With this specify code, no hardware is shipped. The physical adapters, controllers, and cables must be ordered with their own chargeable feature numbers. There are more technically supported configurations than are represented by these specify codes. IBM Manufacturing and IBM configurator tools such as e-config only understand and support EXP24SX configurations represented by these specify codes.

Specify code	Mode	Cable to		Environment
		Adapter/Controll	drawer	
EJW0	Mode 1 CEC SAS Ports	2 Y012 cables		AIX/IBM i/Linux/VIOS
EJW1	Mode 1 One (unpaired) #EJ0J/#EJ0M	1 Y012 cable		AIX/IBM i/Linux/VIOS
EJW2	Mode 1 Two (one pair) #EJ0J/#EJ0M	2 Y012 cables		AIX/IBM i/Linux/VIOS
EJW3	Mode 2 Two (unpaired) #EJ0J/#EJ0M	2 X12 cables		AIX/Linux/VIOS
EJW4	Mode 2 Four (two pair) #EJ0J/#EJ0M	2 X12 cables		AIX/Linux/VIOS

EJW5	Mode 4 Four (unpaired)	2 X12 cables EJ0J/EJ0M	AIX/Linux/VIOS
EJW6	Mode 2 One (unpaired)	2 Y012 cables #EJ0J/#EJ0M	AIX/Linux/VIOS
EJW7	Mode 2 Two (unpaired)	2 Y012 cables #EJ0J/#EJ0M	AIX/Linux/VIOS
EJWF	Mode 1 Two (one pair)	2 Y012 cables #EJ14	AIX/IBM i/Linux/VIOS
EJWG	Mode 2 Two (one pair)	2 X12 cables #EJ14	AIX/Linux/VIOS
EJWJ	Mode 2 Four (two pair)	2 X12 cables #EJ14	AIX/Linux/VIOS

All of the above EXP24SX specify codes assume a full set of adapters and cables able to run all the SAS bays configured. The following specify codes communicate to IBM Manufacturing a lower-cost partial configuration is to be configured where the ordered adapters and cables can run only a portion of the SAS bays. The future MES addition of adapters and cables can enable the remaining SAS bays for growth. The following specify codes are used:

Specify code	Mode	Adapter/Controller	Cable to drawer	Environment
EJWA (1/2 of EJW7)	Mode 2	One (unpaired) #EJ0J/#EJ0M	1 Y012 cables	AIX/Linux/VIOS
EJWB (1/2 of EJW4)	Mode 2	Two (one pair) #EJ0J/#EJ0M	1 X12 cable	AIX/Linux/VIOS
EJWC (1/4 of EJW5)	Mode 4	One (unpaired) #EJ0J/#EJ0M	1 X12 cable	AIX/Linux/VIOS
EJWD (1/2 of EJW5)	Mode 4	Two (unpaired) #EJ0J/#EJ0M	1 X12 cable	AIX/Linux/VIOS
EJWE (3/4 of EJW5)	Mode 4	Three (unpaired) #EJ0J/#EJ0M	2 X12 cables	AIX/Linux/VIOS
EJWH (1/2 of EJWJ)	Mode 2	Two (one pair) #EJ14	1 X12 cable	AIX/Linux/VIOS

An EXP24SX drawer in mode 4 can be attached to two or four SAS controllers and provide a great deal of configuration flexibility. For example, if using unpaired feature EJ0J adapters, these EJ0J adapters could be in the same server in the same partition, same server in different partitions, or even different servers.

An EXP24SX drawer in mode 2 has similar flexibility. If the I/O drawer is in mode 2, then half of its SAS bays can be controlled by one pair of PCIe3 SAS adapters, such as a 12 GB write-cache adapter pair (#EJ14), and the other half can be controlled by a different PCIe3 SAS 12 GB write cache adapter pair or by zero-write-cache PCIe3 SAS adapters.

Note that for simplicity, IBM configurator tools such as e-config assume that the SAS bays of an individual I/O drawer are controlled by one type of SAS adapter. As a client, you have more flexibility

than e-config understands.

A maximum of 24 2.5-inch SSDs or 2.5-inch HDDs is supported in the EXP24SX 24 SAS bays. There can be no mixing of HDDs and SSDs in the same mode 1 drawer. HDDs and SSDs can be mixed in a mode 2 or mode 4 drawer, but they cannot be mixed within a logical split of the drawer. For example, in a mode 2 drawer with two sets of 12 bays, one set could hold SSDs and one set could hold HDDs, but you cannot mix SSDs and HDDs in the same set of 12 bays.

The indicator feature EHS2 helps IBM Manufacturing understand where SSDs are placed in a mode 2 or a mode 4 EXP24SX drawer. On one mode 2 drawer, use a quantity of one feature EHS2 to have SSDs placed in just half the bays, and use two EHS2 features to have SSDs placed in any of the bays. Similarly, on one mode 4 drawer, use a quantity of one, two, three, or four EHS2 features to indicate how many bays can have SSDs. With multiple EXP24SX orders, IBM Manufacturing will have to guess which quantity of feature ESH2 is associated with each EXP24SX. Consider using CSP (feature 0456) to reduce guessing.

Two-and-a-half-inch small form factor (SFF) SAS HDDs and SSDs are supported in the EXP24SX. All drives are mounted on Gen2 carriers or trays and thus named SFF-2 drives.

The EXP24SX drawer has many high-reliability design points:

- SAS drive bays that support hot swap
- Redundant and hot-plug-capable power and fan assemblies
- Dual line cords
- Redundant and hot-plug enclosure service modules (ESMs)
- Redundant data paths to all drives
- LED indicators on drives, bays, ESMs, and power supplies that support problem identification
- Through the SAS adapters or controllers, drives that can be protected with RAID and mirroring and hot-spare capability

Order two ESLA features for AC power supplies. The enclosure is shipped with adjustable depth rails and can accommodate 19-inch rack depths from 59.5--75 centimeters (23.4--29.5 inches). Slot filler panels are provided for empty bays when initially shipped from IBM.

PCIe Gen4 I/O Expansion Drawer

The PCIe Gen4 I/O Expansion Drawer (#ENZ0) is a 4U high, 19-inch wide, PCIe Gen4 based rack mountable I/O drawer that is available as a feature of Power10 Servers.

The PCIe Gen4 I/O Expansion Drawer (#ENZ0) replaces the PCIe Gen3 I/O Expansion Drawer (#EMX0). There is no upgrade path from PCIe Gen3 I/O Expansion Drawer (#EMX0) to PCIe Gen4 I/O Expansion Drawer (#ENZ0).

The PCIe Gen4 FanOut Module (#ENZF) is the fan out module (FOM) for placement in PCIe Gen4 I/O Expansion Drawer (#ENZ0). Each FOM provides six PCIe Gen4 slots (4 x16 & 2 x8) slots. All six slots, including the x8 slots, use x16 connectors. A fully populated PCIe Gen4 I/O Expansion Drawer (#ENZ0) with two PCIe Gen4 FanOut Module (#ENZF) provides twelve PCIe Gen4 slots (8 x16 & 4 x8). Each PCIe Gen4 FOM (#ENZF) only connects to PCIe x16 to CXP Converter Card features #EJ24 or #EJ2A.

For Power S1014 server the PCIe slots are enabled to support the PCIe x16 to CXP Converter Card (FC EJ2A) that is used to attach expansion drawers and requires PCIe Gen4 CXP Active Optional Cables, such as features #ECLX/#ECLY or Copper Cable such as feature #ECLS.

The following adapter features are supported for installation within the PCIe Gen4 I/O Expansion Drawer (#ENZ0):

- EC2S - PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
- EC2U - PCIe3 2-Port 25/10 Gb NIC&ROCE SR/Cu Adapter
- EC72 - PCIe4 x8 2-PORT 25Gb EN ConnectX-6 Lx SFP28 NO Crypto LP Capable Adapter
- EN2W - PCIe2 4-port 10GbE 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
- 5899 - PCIe2 4-port 1GbE Adapter
- EN1E - PCIe3 16Gb 4-port Fibre Channel Adapter
- EN1J - PCIe4 32Gb 2-port Fibre Channel Adapter
- EN1C - PCIe3 16Gb 4-port Fibre Channel Adapter
- EN1A - PCIe3 32Gb 2-port Fibre Channel Adapter
- EN1L - PCIe4 32Gb 4-port Fibre Channel Adapter
- EN1N - PCIe4 64Gb 2-port Fibre Channel Adapter
- EN2L - PCIe4 32Gb 4-port Fibre Channel Adapter
- EN2N - PCIe4 64Gb 2-port Fibre Channel Adapter
- EJ2B - PCIe3 12Gb x8 SAS TAPE HBA W/4X HD MINISAS, LP Capable Adapter
- EC6K - PCIe2 x1 USB 3.0 2-port LP Capable Adapter
- EJ37 - PCI3 x4 Crypto Coproc GEN3' Blind Swap Cassette LP Capable Adapter IN

Limitations:

- No mixing is allowed of PCIe Gen3 I/O Expansion Drawer (#EMX0) and PCIe Gen4 I/O Expansion Drawer (#ENZ0) on initial orders.
- PCIe Gen4 I/O Expansion Drawer (#ENZ0) is allowed to be ordered as MES and added to existing configurations that include the PCIe Gen3 I/O Expansion Drawer (#EMX0).
- Combined maximum of NED24 NVMe Expansion Drawer (#ESR0), PCIe Gen4 I/O Expansion Drawer (#ENZ0) and PCIe Gen3 I/O Expansion Drawer (#EMX0) is half of maximum of controller card #EJ24 or #EJ2A allowed per server.
- A 1 EIA (1U) of space is required in the IBM 7965-S42 rack or any OEM rack between the top of the PCIe Gen4 I/O Expansion Drawer (#ENZ0) and the bottom of a Scale-out server (MTM's 9105-22A/22B/41B/42A, 9786-22H/42H) or NED24 NVMe Expansion Drawer (#ESR0) when installed directly below one of these options. This applies to both factory integrated orders (#4651-#4666) and systems integrated in the field (#4650). This 1U of space is required for correct function of the cable management bracket and serviceability of the PCIe Gen4 I/O Expansion Drawer (#ENZ0).
- The PCIe Gen4 I/O Expansion Drawer (#ENZ0) is supported with firmware 1050 and HMC version 10.3.1050

PCIe Gen3 I/O drawer cabling option

A copper cabling option (#ECCS) is available for the scale-out servers. The cable option offers a much lower-cost connection between the server and the PCIe Gen3 I/O drawer fanout modules. The currently available Active Optical Cable (AOC) offers much longer length cables, providing rack placement flexibility. Plus, AOC cables are much thinner and have tighter bend radius and thus are much easier to cable in the rack.

The 3M Copper CXP Cable Pair (#ECCS) has the same performance and same reliability, availability, and serviceability (RAS) characteristics as the AOC cables. One copper cable length of 3 meters is offered. Note that the cable management arm of the scale-out servers requires about 1 meter of cable.

Like the AOC cable pair, the copper pair is cabled in the same manner. One cable attaches to the top CXP port in the PCIe adapter in the x16 PCIe slot in the server system unit and then attaches to the top CXP port in the fanout module in the I/O drawer. Its cable pair attaches to the bottom CXP port of the same PCIe adapter and to the bottom CXP port of the same fanout module. Note that the PCIe adapter providing the CXP ports on the server was named a PCIe3 "Optical" Cable Adapter. In hindsight, this naming was unfortunate as the adapter's CXP ports are not unique to optical. But at the time, optical cables were the only connection option planned.

Copper and AOC cabling can be mixed on the same server. However, they cannot be mixed on the same PCIe Gen3 I/O drawer or mixed on the same fanout module.

Copper cables have the same operating system software prerequisites as AOC cables.

Racks

The Power S1014 server is designed to fit a standard 19-inch rack. IBM Development has tested and certified the system in the IBM Enterprise Rack (7965-S42). The 7965-S42 rack is a two-meter enterprise rack that provides 42U or 42 EIA of space. You can choose to place the server in other racks if you are confident those racks have the strength, rigidity, depth, and hole pattern characteristics required. You should work with IBM Service to determine the appropriateness of other racks.

It is highly recommended that the Power S1014 server be ordered with an IBM 42U Enterprise Rack (7965-S42). An initial system order is placed in a 7965-S42 rack. This is done to ease and speed client installation, provide a more complete and higher quality environment for IBM Manufacturing system assembly and testing, and provide a more complete shipping package.

Recommendation: The 7965-S42 rack has optimized cable routing, so all 42U may be populated with equipment.

The 7965-S42 rack does not need 2U on either the top or bottom for cable egress.

With the two-meter 7965-S42 rack, a rear rack extension of 12.7 centimeters (5 inches) feature ECRK provides space to hold cables on the side of the rack and keep the center area clear for cooling and service access.

Recommendation: Include the above extensions when approximately more than 16 I/O cables per side are present or may be added in the future; when using the short-length, thinner SAS cables; or

when using thinner I/O cables, such as Ethernet. If you use longer-length, thicker SAS cables, fewer cables will fit within the rack.

SAS cables are most commonly found with multiple EXP24SX SAS Drawers (#ESLS) driven by multiple PCIe SAS adapters. For this reason, it is good practice to keep multiple EXP24SX drawers in the same rack as the PCIe I/O drawer or in a separate rack close to the PCIe I/O drawer, using shorter, thinner SAS cables. The feature ECRK extension can be good to use even with smaller numbers of cables because it enhances the ease of cable management with the extra space it provides.

Multiple service personnel are required to manually remove or insert a system node drawer into a rack, given its dimensions and weight and content.

Recommendation: To avoid any delay in service, obtain an optional lift tool (#EB3Z). A lighter, lower-cost lift tool is FC EB3Z(3)(lift tool) and EB4Z(3)(angled shelf kit for lift tool). The EB3Z lift tool provides a hand crank to lift and position a server up to 400 pounds. Note that a single system node can weigh up to 86.2 kilograms (190 pounds).

(3)Features EB3Z and EB4Z are not available to order in Albania, Bahrain, Bulgaria, Croatia, Egypt, Greece, Jordan, Kuwait, Kosovo, Montenegro, Morocco, Oman, UAE, Qatar, Saudi Arabia, Serbia, Slovakia, Slovenia, Taiwan, and Ukraine.

High-function (switched and monitored) PDUs plus

Hardware:

- IEC 62368-1 and IEC 60950 safety standard
- A new product safety approval
- No China 5000-meter altitude or tropical restrictions
- Detachable inlet for 3-phase delta-wired PDU with 30A, 50A, and 60A wall plugs
- IBM Technology and Qualification approved components, such as anti-sulfur resistors (ASRs)
- Ethernet 10/100/1000 Mb/s

Software:

- Internet Protocol (IP) version 4 and IPv6 support
- Secure Shell (SSH) protocol command line
- Ability to change passwords over a network

PDU description 208 V 3-phase delta 200 V--240 V 1-phase or 3-phase wye

High-Function 12xC13 #ECJQ/#ECJP #ECJN/#ECJM

High-Function 9xC19 #ECJL/#ECJK #ECJJ/#ECJG

These PDUs can be mounted vertically in rack-side pockets or they can be mounted horizontally. If mounted horizontally, they each use one EIA (1U) of rack space. See feature EPTH for horizontal mounting hardware, which is used when IBM Manufacturing doesn't automatically factory-install the PDU. Two RJ45 ports on the front of the PDU enable you to monitor each receptacle's electrical power usage and to remotely switch any receptacle on or off.

Recommendation: The PDU is shipped with a generic PDU password. IBM strongly urges you to change it upon installation.

Existing and new high-function (switched and monitored) PDUs have the same physical dimensions. New high-function (switched and monitored) PDUs can be supported in the same racks as existing PDUs. Mixing of PDUs in a rack on new orders is not allowed.

Also, all factory-integrated orders must have the same PDU line cord.

The PDU features ECJQ/ECJP and ECJL/ECJK with the Amphenol inlet connector require new PDU line cords:

- #ECJ5 - 4.3-meter (14-foot) PDU to Wall 3PH/24A 200--240V Delta-wired Power Cord
- #ECJ7 - 4.3-meter (14-foot) PDU to Wall 3PH/48A 200--240V Delta-wired Power Cord

No pigtail (like #ELC0) is available because an Amphenol male inline connector is unavailable.

The PDU features ECJJ/ECJG and ECJN/ECJM with the UTG624-7SKIT4/5 inlet connector use the existing PDU line cord features 6653, 6667, 6489, 6654, 6655, 6656, 6657, 6658, 6491, or 6492.

Reliability, Availability, and Serviceability

Reliability, fault tolerance, and data correction

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

The Power10 processor-based scale-out systems come with the following RAS characteristics:

- Power10 processor RAS
- Open Memory Interface, DDIMMs RAS
- Enterprise BMC service processor for system management and Service
- AMM for Hypervisor
- NVMe drives concurrent maintenance
- PCIe adapters concurrent maintenance
- Redundant and hot-plug cooling
- Redundant and hot-plug power
- Light path enclosure and FRU LEDs
- Service and FRU labels
- Client or IBM install
- Proactive support and service -- call home
- Client or IBM service

Service processor

Power10 scale-out 2S-4S systems come with a redesigned service processor based on a Baseboard Management Controller (BMC) design with firmware that is accessible through open-source industry

standard APIs, such as Redfish. An upgraded ASMI web browser user interface preserves the required RAS functions while allowing the user to perform tasks in a more intuitive way.

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. It runs on its own power boundary and does not require resources from a system processor to be operational to perform its tasks.

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 BMC service processors menus (ASMI) can be accessed concurrently during system operation, allowing nondisruptive abilities to change system default parameters, view and download error logs, check system health.

Redfish, an industry standard for server management, enables the Power servers to be managed individually or in a large data center. Standard functions such as inventory, event logs, sensors, dumps, and certificate management are all supported with Redfish. In addition, new user management features support multiple users and privileges on the BMC via Redfish or ASMI. User management via LDAP is also supported. The Redfish events service provides a means for notification of specific critical events such that actions can be taken to correct issues. The Redfish telemetry service provides access to a wide variety of data (eg. power consumption, ambient, core, DIMM and I/O temperatures, etc) that can be streamed on periodic intervals.

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 Power family does ambient and over temperature monitoring and reporting. It also adjusts fan speeds automatically based on those temperatures.

Memory subsystem RAS:

The Power10 scale-out system introduces a new 2U tall DDIMM, which has new open CAPI memory interface known as OMI for resilient and fast communication to the processor. This new memory subsystem design delivers solid RAS as described below.

Power10 processor functions

As in Power9, the Power10 processor has the ability to do processor instruction retry for some transient errors and core-contained checkstop for certain solid faults. The fabric bus design with CRC and retry persists in Power10 where a CRC code is used for checking data on the bus and has an ability to retry a faulty operation.

Cache availability

The L2/L3 caches in the Power10 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 cache from immediately causing the system to terminate. Rather, the system tags the data and determines whether it will ever be used again. If the error is irrelevant, it will not force a check stop. 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 if the data is not owned by the hypervisor.

PCI extended error handling

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

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 SSR setup, install, and service
- Error Detection and Fault Isolation (ED/FI)
- First Failure Data Capture (FFDC)
- Light path service indicators
- Service and FRU labels available on the system
- Service procedures documented in IBM Documentation or available through the HMC

- Automatic reporting of serviceable events to IBM through the Electronic Service Agent Call Home application

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 Power10 processor-based systems 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.
- No HMC. There are two service strategies for non-HMC systems.
 - Full-system partition with PowerVM: A single partition owns all the server resources and only one operating system may be installed. The primary service interface is through the operating system and the service processor.
 - Partitioned system with NovaLink: In this configuration, the system can have more than one partition and can be running more than one operating system. The primary service interface is through 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
- BMC 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 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 identify will occur to identify an enclosure in a rack. These enclosure LEDs will turn

on solid and can be used to follow the light path from 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 re-create 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.

Standalone diagnostics

As the name implies, standalone 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 and NVMe drives are supported with PowerVM. Power supplies, fans, and op panel LCD are hot pluggable.

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, processors, fans, adapter cards, 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 for Power10 processor-based systems which contains each MTM service functions of interest while physically located at the server. These include things such as installation and repair instructions, reference code look up, and so on.

Packaging for service

The following service features 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, thumbscrews, 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 filesystem. 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. Client 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 partition running on one Power partition system to another Power system without disrupting services. The migration transfers the entire system environment, including processor state, memory, attached virtual devices, and connected users. It provides continuous operating system and application availability during planned partition outages for repair of hardware and firmware faults. The Power10 systems using Power10-technology support secure LPM, whereby the VM image is encrypted and compressed prior to transfer. Secure LPM uses on-chip encryption and compression capabilities of the Power10 processor for optimal performance.

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 the Electronic Service Agent (ESA) imbedded in the HMC or through a version of ESA imbedded in the operating systems for non-HMC-managed or A version of ESA that runs as a standalone call home application. 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. See the next section for specific details on this application.

IBM Electronic Services

Electronic Service Agent and Client Support Portal (CSP) 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 and collects hardware and software 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. In addition, Call Home Cloud Connect Web and Mobile capability extends the common solution and offers IBM Systems related support information applicable to Servers and Storage.

Details are available here: <https://clientvantage.ibm.com/channel/ibm-call-home-connect>.

System configuration and inventory information collected by Electronic Service Agent also can be 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 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](#).

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 through the internet (HTTPS) to provide clients a single point of exit from their site. Initiation of 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.

Client Support Portal

Client Support 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.

This web portal 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 IBM ID.

For more information on how to utilize client support portal, visit the following website or contact an [IBM Systems Services Representative](#).

Section 508 of the US Rehabilitation Act [@](#)

The product or offering is capable as of the planned availability date, when used in accordance with associated IBM documentation, of satisfying the applicable standards, including the Worldwide Consortium Web Content Accessibility Guidelines, European Standard EN 301 349, and US Section 508, provided that any assistive technology used with the product properly interoperates with it. An Accessibility Conformance Statement can be requested on the [Product accessibility information](#) website.

Models [@](#)

Model summary matrix [@](#)

Model	Processor	Processor socket	Memory	NVMe drive
41B	Power10	One	1 TB	U.2

Customer setup (CSU) [@](#)

Yes.

Devices supported [@](#)

The 7226-1U3 that offers a 1U rack-mountable dual bay enclosure with storage device options of LTO5, 6, 7, and 8 tape drives with both SAS and Fiber Channel interface; the 7226 also offers DVD-RAM SAS and USB drive features as well as RDX 500GB, 1TB, and 2TB drive options. Up to two drives (or four DVD-RAM) can be installed in any combination in the 7226 enclosure.

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 clients:

Feature conversions for 9105-41B adapter features:

From FC:	To FC:	RETURN PARTS
EJ20 - PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	EJ2A - PCIe4 x16 to CXP Converter Adapter (support AOC)	No
EJ35 - PCIe3 Crypto Coprocessor no BSC 4769	EJ37 - PCIe3 Crypto Coprocessor BSC-Gen3 4769	No

Feature conversions for 9105-41B 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 9105-41B miscellaneous features:

From FC:	To FC:	RETURN PARTS
EJUZ - OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side	EJUV - Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount	No
EJVZ - OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side	EJUX - Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	No
EJUY - IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side	EJXU - Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount	No

EJVY - IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side	EJXW - Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	No
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Feature conversions for 9105-41B rack-related features:

From FC:	To FC:	RETURN PARTS
EJXU - Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount	EJUY - IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side	No
EJUV - Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount	EJUZ - OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side	No
EJXW - Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	EJVY - IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side	No
EJUX - Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	EJVZ - OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side	No
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

Technical description [@](#)

Physical specifications [@](#)

- 19-inch rack-mount hardware
 - Width(1): 482 mm (18.97 in.)
 - Depth(2): 712 mm (28 in.)
 - Height: 173 mm (6.8 in.)
 - Weight: 36.28 kg (80 lb)
- Tower hardware
 - Width with stand: 329 mm (13 in.)
 - Depth with front-rotatable door: 815 mm (32 in.)
 - Height with handle: 522 mm (20.6 in.)
 - Weight: 47.62 kg (105 lb)

1. The width is measured to the outside edges of the rack-mount bezels. The width is 446 mm (17.6 in.) for the main chassis which fits in between a 482.6 mm (19 in.) rack mounting flanges.
2. The cable management arm with the maximum cable bundle adds 248 mm (9.8 in.) to the depth.

Operating environment

Electrical characteristics

- AC rated voltage and frequency(2): 100--127(5)V AC or 200--240 V AC at 50 or 60 Hz plus or minus 3 Hz
- Thermal output (maximum)(3): 3668 BTU/hr
- Maximum power consumption(3): 1075 W
- Maximum kVA(4): 1.105 kVA
- Phase: Single

1. Redundancy is supported. The Power S1014 with 1600 W power supplies has a maximum of two power supplies. The Power S1014 with 1200 W power supplies has a maximum of four power supplies, but can operate on two power supplies. There are no specific plugging rules or plugging sequence when you connect the power supplies to the rack PDUs. All the power supplies feed a common DC bus.

2. The power supplies automatically accept any voltage with the published, rated-voltage range. If multiple power supplies are installed and operating, the power supplies draw approximately equal current from the utility (electrical supply) and provide approximately equal current to the load.

3. Power draw and heat load vary greatly by configuration. When you plan for an electrical system, it is important to use the maximum values. However, when you plan for heat load, you can use the IBM Systems Energy Estimator to obtain a heat output estimate based on a specific configuration. For more information, see [The IBM Systems Energy Estimator website](#).

4. To calculate the amperage, multiply the kVA by 1,000 and divide that number by the operating voltage.

5. The Power S1014 with 1200 W power supplies supports 100--127 V AC.

Environment (operating)(1)

- ASHRAE class; allowable A3 (fourth edition)
- Airflow direction; recommended Front-to-back
- Temperature: Recommended 18.0°C--27.0°C (64.4°F--80.6°F); allowable 5.0°C--40.0°C (41.0°F--104.0°F)
- Low-end moisture: Recommended 9.0°C (15.8°F) dew point; allowable -12.0°C (10.4°F) dew point and 8% relative humidity
- High-end moisture: Recommended 60% relative humidity and 15°C (59°F) dew point; allowable 85% relative humidity and 24.0°C (75.2°F) dew point
- Maximum altitude: 3,050 m (10,000 ft)

Allowable environment (nonoperating)(5)

- Temperature: Recommended 5°C--45°C (41°F--113°F)
- Relative humidity: Recommended 8% to 85%
- Maximum dew point: Recommended 27.0°C (80.6°F)

1. IBM provides the recommended operating environment as the long- term operating environment that can result in the greatest reliability, energy efficiency, and reliability. The allowable operating environment represents where the equipment is tested to verify functionality. Due to the stresses that operating in the allowable envelope can place on the equipment, these envelopes must be used for short-term operation, not continuous operation. There are a very limited number of configurations that must not operate at the upper bound of the A3 allowable range. For more information, consult your IBM technical specialist.
2. Must derate the maximum allowable temperature 1°C (1.8°F) per 175 m (574 ft) above 900 m (2,953 ft) up to a maximum allowable elevation of 3,050 m (10,000 ft).
3. The minimum humidity level is the larger absolute humidity of the -12°C (10.4°F) dew point and the 8% relative humidity. These levels intersect at approximately 25°C (77°F). Below this intersection, the dew point (-12°C) represents the minimum moisture level, while above it, the relative humidity (8%) is the minimum. For the upper moisture limit, the limit is the minimum absolute humidity of the dew point and relative humidity that is stated.
4. The following minimum requirements apply to data centers that are operated at low relative humidity:
 - Data centers that do not have ESD floors and where people are allowed to wear non-ESD shoes might want to consider increasing humidity given that the risk of generating 8 kV increases slightly at 8% relative humidity, when compared to 25% relative humidity.
 - All mobile furnishings and equipment must be made of conductive or static dissipative materials and be bonded to ground.
 - During maintenance on any hardware, a properly functioning and grounded wrist strap must be used by any personnel who comes in contact with information technology (IT) equipment.
5. Equipment that is removed from the original shipping container and is installed, but is powered down. The allowable non-operating environment is provided to define the environmental range that an unpowered system can experience short term without being damaged.

Electromagnetic compatibility compliance: CISPR 22; CISPR 32; CISPR 24; CISPR 35; FCC, CFR 47, Part 15 (US); VCCI (Japan); EMC Directive (EEA); ICES-003 (Canada); ACMA (Australia, New Zealand); CNS 13438 (Taiwan); Radio Waves Act (Korea); Commodity Inspection Law (China); QCVN 118 (Vietnam); MoCI (Saudi Arabia); SI 961 (Israel); EAC (EAU).

Safety compliance: This product was designed, tested, manufactured, and certified for safe operation. It complies with IEC 60950-1 and/or IEC 62368-1 and where required, to relevant national differences/deviations (ND) to these IEC base standards. This includes, but is not limited to: EN (European Norms including all Amendments under the Low Voltage Directive), UL/CSA (North America bi-national harmonized and marked per accredited NRTL agency listings), and other such derivative

certifications according to corporate determinations and latest regional publication compliance standardized requirements.

See the Installation Planning Guide in [IBM Documentation](#) for additional detail.

Limitations

- Feature #EPG2 - 8-core Typical 3.00 to 3.90 GHz (max) Power10 Processor IS NOT supported on a tower/deskside 41B configuration.
- If IBM i (#2145) is selected as the primary operating system, then feature (#0047) -Device Parity RAID-6 All, Specify Code with NVMe devices is not allowed.
- There is not physical system port on the scale-out Power10 servers.

Power S1014 (MTM 9105-41B) with High-density 24-core processor (FC EPH8) is rack only, no deskside support and the following I/O adapters are restricted:

- (#EC2S) -PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
- (#EC2U) -PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu 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
- (#EC7K) -PCIe4 1.6TB NVMe Flash Adapter x8 for IBM i
- (#EC7M) -PCIe4 3.2TB NVMe Flash Adapter x8 for IBM i
- (#EC7P) -PCIe4 6.4TB NVMe Flash Adapter x8 for IBM i
- (#EC5B) -PCIe3 x8 1.6 TB NVMe Flash Adapter for AIX/Linux
- (#EC5D) -PCIe3 x8 3.2 TB NVMe Flash Adapter for AIX/Linux
- (#EC5F) -PCIe3 x8 6.4 TB NVMe Flash Adapter for AIX/Linux
- (#EC6V) -PCIe3 x8 1.6 TB NVMe Flash Adapter for IBM i
- (#EC6X) -PCIe3 x8 3.2 TB NVMe Flash Adapter for IBM i
- (#EC6Z) -PCIe3 x8 6.4 TB NVMe Flash Adapter for IBM i

Power S1014 (MTM 9105-41B) with High-density 24-core processor (FC #EPH8) is rack only, no deskside support and the following I/O adapters are restricted from installation in slots C7 and C8:

- (#EJ14) -PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
- (#EJ0L) -PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
- (#EJ0J) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8
- (#EJ10) -PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
- (#EN1E) -PCIe3 16Gb 4-port Fibre Channel Adapter
- (#EN1C) -PCIe3 16Gb 4-port Fibre Channel Adapter
- (#EJ32) -PCIe3 Crypto Coprocessor no BSC 4767
- (#EJ35) -PCIe3 Crypto Coprocessor no BSC 4769

Boot requirements

- If IBM i (#2145) is selected as the primary operating system and SAN boot is not selected (#0837), one of the load source specify codes for SAS drives or NVMe devices in Special Features - Initial

Orders - Specify codes section must be specified.

- If IBM i (#2145) is selected and the load source disk unit is not in the system unit (CEC), one of the following specify codes must also be selected:
 - Feature (#0719) Load Source Not in CEC and are to be placed in I/O drawers or in external SAN-attached disk
 - Feature (#EHR2) Load Source Specifies DASD are placed in an EXP24SX SFF Gen2 bay Drawer (#ESLS)
 - Feature (#0837) SAN Operating System Load Source Specify
- If IBM i (#2145) is selected, one of the following system console specify codes must be selected:
 - Feature (#5550) -- System Console on HMC
 - Feature (#5557) -- System Console - Internal LAN

The following I/O adapters are restricted from installation in slot C7:

- (#EJ0J) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8
- (#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

Hardware requirements [@](#)

Power S1014 system configuration

The minimum Power S1014 initial order must include a processor module, two 16 GB DIMMs (one feature EM6N 32 GB (2 x 16 GB) DDIMM), four or two power supplies and line cords, an operating system indicator, a cover set indicator, and a Language Group Specify. Also, it must include one of these storage options and one of these network options:

Storage options:

- For boot from NVMe for AIX/Linux: One NVMe drive slot and one NVMe drive or one PCIe NVMe add-in adapter.
- For boot from NVMe for IBM i: Two NVMe drive slots and two NVMe drives or two PCIe NVMe add-in adapters.
- For boot from SAN: Internal NVMe drive and RAID card are **not** required if feature 0837 (boot from SAN) is selected. An FC adapter must be ordered if feature 0837 is selected.

Network options:

- One PCIe2 4-port 1 Gb Ethernet adapter
- One of the supported 10 Gb Ethernet adapters

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

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
Op-Panel	EUOK	Operator Panel LCD Display		1	Mandatory for Tower configuration. Optional for Rack configuration with AIX/Linux. Always default Qty. 1, but can be deselected for AIX/Linux.
	5228	PowerVM Enterprise Edition	1	1	
Virtualization Engine	or				Must select one option.
	EPA0	Deactivation of LPM (Live Partition Mobility)		1	
Processor Modules	EPG0	4-core Typical 3.0 to 3.90 Ghz (max) Power10 Processor		1	
	or				Must select one Processor Module option.
	EPG2	8-core Typical 3.0 to 3.90 Ghz (max) Power10 Processor		1	
	or				
	EPH8	24-core Typical 2.75 to 3.90 GHz (max)		1	

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		Power10 Processor			
		One Processor			
	EPFT	Core Activation for EPG0		4	
		or			
Processor Module Activations	EPF6	One Processor Core Activation for EPG2		8	All processor cores must be activated on the Processor Module selected.
	EPFZ	One Processor Core Activation for EPH8		24	
Memory		32GB (2x16GB)			Minimum 2 DIMMs = 1 DIMM feature.
	EM6N	DDIMMs, 3200 MHz, 8GBIT DDR4 Memory		1	
		or			
	EM6W	64GB (2x32GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory		1	
		or			
	EM6X	128GB (2x64GB) DDIMMs,		1	

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		3200 MHz, 16GBIT DDR4 Memory			
		or			
	EM6Y	256GB (2x128GB) DDIMMs,			
		2666 MHz, 16GBIT DDR4 Memory	1		
Storage Backplane	EJ1Y	Storage Backplane with eight NVMe U.2 drive slots	1		Must order Qty. 1 NVMe backplane feature except when #0837 or #ESCR (iSCSI boot) is on the order or when NVMe PCIe add-in adapter card is used as the Load Source. Mixing NVMe devices is allowed on each backplane.
Bezels / Covers and Doors	EJXU	Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount	1		When no NVMe backplane is ordered and no RDX is ordered, default #EJXU. When no NVMe backplane is ordered and there is an RDX on the order, default #EJXW.
		or			
	EJUV	Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount	1		Tower models: When no NVMe backplane is ordered and no RDX is ordered, default #EJUY. When
		or			

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
	EJXW	Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount		1	no NVMe backplane is ordered and there is an RDX on the order, default #EJVY.
or					
	EJUX	Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount		1	
or					
	EJUY	IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side		1	
or					
	EJUZ	OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side		1	
or					
	EJVY	IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side		1	
or					
	EJVZ	OEM Cover and Doors for 16 NVMe-		1	

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		bays and RDX Backplane Desk-side			
NVMe Devices	EC7T	800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux	2	0	For AIX/Linux, default is Qty. 2. For 8-Core or 24-Core Processor configuration, it is allowed to be changed to any quantity. From Qty. 0 to Qty. 16. Note: See 4-Core Power S1014 processor section for specific limitations.
Required LAN adapters	EC2U	PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter		1	
		or			Qty. 1 of these LAN features required on all Initial orders. Default Adapter: feature 5899.
	EN2Z	PCIe 4-Port 1GbE Adapter	1	1	
		or			
	ENOW	PCIe2 2-port 10/1GbE BaseT RJ45 Adapter		1	
Power Supply		AC Power Supply -			Each initial order must have all power supplies present, power supplies cannot be added later on. Only 200-
	EB3S	1600W for Server (200-240 VAC)	2	2	

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		or			-240V power cords can be used. For 41B Tower/Desktop configuration #EB3W - Qty. 4 (only option). For 41B Rack configuration: #EB3S - Qty. 2 (default).
	EB3W	AC Power Supply - 1200W for Server (100-127V/200-240V)		4	
Power Cables	6458	Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)	4	4	Qty. 4 or Qty. 2 required.
Language Group	9300	Language Group Specify - US English	1	1	Language Specify code is required.
Primary Operating	2146	Primary OS - AIX		1	Must select one option.
	or				
	2147	Primary OS - Linux		1	

1. The racking approach for the initial order can be a MTM 7965-S42.

The minimum defined initial order configuration, if no choice is made, when IBM i is the primary operating system, is:

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
Op-Panel	EUOK	Operator Panel LCD Display		1	Mandatory Qty. 1 with IBM i.

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
Virtualization Engine	5228	PowerVM Enterprise Edition	1	1	Must select one option.
	EPA0	Deactivation of LPM (Live Partition Mobility)		1	
Processor Modules	EPG0	4-core Typical 3.0 to 3.90 Ghz (max) Power10 Processor		1	Must select one Processor Module option.
	EPG2	8-core Typical 3.0 to 3.90 Ghz (max) Power10 Processor		1	
Processor Module Activations	EPFT	One Processor Core Activation for EPG0		4	All processor cores must be activated on the Processor Module selected.
	EPF6	One Processor Core Activation for EPG2		8	

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		32GB (2x16GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory		1	
		or			
		64GB (2x32GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory		1	
		or			Minimum 2 DIMMs = 1 DIMM feature. Features EM6X and EM6Y are not available with 4-core processor module configuration.
Memory	EM6X	128GB (2x64GB) DDIMMs, 3200 MHz, 16GBIT DDR4 Memory		1	
		or			
	EM6Y	256GB (2x128GB) DDIMMs, 2666 MHz, 16GBIT DDR4 Memory		1	
Storage Backplane	EJ1Y	Storage Backplane with eight NVMe U.2 drive slots		1	Must order 1 NVMe backplane feature except when #0837 is on the order or when NVMe PCIe add-in adapter card is used as the Load Source. Mixing NVMe

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
					devices is allowed on each backplane.
Bezels / Covers and Doors	EJXU	Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount	1		When no NVMe backplane is ordered and no RDX is ordered, default #EJXU. When no NVMe backplane is ordered and there is an RDX on the order, default #EJXW.
		or			
	EJUV	Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount	1		Tower models: When no NVMe backplane is ordered and no RDX is ordered, default #EJUY. When no NVMe backplane is ordered and there is an RDX on the order, default #EJVY.
		or			
	EJXW	Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	1		
		or			
	EJUX	Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount	1		
		or			
	EJUY	IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side	1		
		or			

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
	EJUZ	OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side		1	
	EJVY	IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side		1	
	EJVZ	OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side		1	
NVMe Devices	ES1K	Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i	2	0	For IBM i, default is Qty. 2. For 8-Core Processor configuration, it is allowed to be ordered in any quantity. From Qty. 0 to Qty. 16, except Qty. 1. Note: See 4-Core Power S1014 processor section for specific limitations.
Required LAN adapters	EC2U	PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter	1		Qty. 1 of these LAN features required on all Initial orders. Default Adapter: feature 5899.

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
		or			
	EN2Z	PCIe 4-Port 1GbE Adapter	1	1	
	EB3S	AC Power Supply - 1600W for Server (200-240 VAC)	2	2	Each initial order must have all power supplies present, power supplies cannot be added later on. Only 200-240V power cords can be used. For 41B Tower/Desktop configuration #EB3W - Qty. 4 (only option). For 41B Rack configuration: #EB3S - Qty. 2 (default).
Power Supply	EB3W	AC Power Supply - 1200W for Server (100-127V/200-240V)	4		
Power Cables	6458	Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)	4	4	Qty. 4 or QTY. 2 required.
Language Group	9300	Language Group Specify - US English	1	1	Language Specify code is required.
Primary Operating	2145	Primary OS - IBM i		1	Mandatory feature.

System Feature Codes	Feature Code	Description	Default	Minimum Quantity	Notes
System Consoles	5550	Sys Console On HMC		1	
	or				Must select one System Console feature.
	5557	System Console-Ethernet LAN adapter		1	
Data Protection	0040	Mirrored System Disk Level, Specify Code	1	1	For IBM i OS only - Qty. 1 system data protection code required.

1. The racking approach for the initial order can be either a MTM 7965-S42.

Power10 Tower-to-Rack conversion

The IBM System Server S1014 Tower-to-Rack conversion is available through the following MES parts that you need to convert a 4U server (MTM 9105-41B) from a tower model to a rack model. You can then install the server into a 19-inch rack enclosure.

One of following MES parts is required for the tower-to-rack conversion:

Description	Feature	Comments
Front IBM Bezel for 16 NVMe-bays BackPlane Rack-Mount	#EJXU	Optional, mutually exclusive with #EJUV, #EJXW, and #EJUX
Front IBM Bezel for 16 NVMe-bays and RDX BackPlane Rack-Mount	#EJXW	Optional, mutually exclusive with #EJUV, #EJXU, and #EJUX
Front OEM Bezel for 16 NVMe-bays BackPlane Rack-Mount	#EJUV	Optional, mutually exclusive with #EJXU, #EJXW, and #EJUX
Front OEM Bezel for 16 NVMe-bays and RDX BackPlane Rack-Mount	#EJUX	Optional, mutually exclusive with #EJXU, #EJXW, and #EJUV

Notes:

- Each of these conversions includes the shipping of the Rack-mount Rail Kit feature ERKZ.
- Choose the correct set of power cords to PDU for your rack configuration, depending on the rack type, the PDU type, and the number of power supplies.

- An IBM Service Support Representative (SSR) needs to be dispatched to your site to assist with installation instructions.

Power10 Rack-to-Tower conversion

The System Server S1014 Rack-to-Tower Conversion is also available through the following MES parts that you need to convert a 4U server (MTM 9105-41B) from a rack model to a tower model.

One of following MES parts is required for the tower-to-rack conversion:

Description	Feature	Comments
IBM Cover and Doors for 16 NVMe-bays BackPlane Desk-side	#EJUY	Optional, mutually exclusive with #EJUZ, #EJVY, and #EJVZ
IBM Cover and Doors for 16 NVMe-bays and #EJVY RDX BackPlane Desk-side		Optional, mutually exclusive with #EJUZ, #EJUY, and #EJVZ
OEM Cover and Doors for 16 NVMe-bays BackPlane Desk-side	#EJUZ	Optional, mutually exclusive with #EJUY, #EJUY, and #EJVZ
OEM Cover and Doors for 16 NVMe-bays and #EJVZ RDX BackPlane Desk-side		Optional, mutually exclusive with #EJUY, #EJUY, and #EJUZ

Notes:

- Four 1200 W power supplies are required. If two 1600 W power supplies exist on the rack model, they will be removed on the order.
- Choose the correct set of power cords to wall cables, depending on AC, length of cord required, and number of power cords required per power supply.
- An SSR needs to be dispatched to your site to assist with installation instructions.

Hardware Management Console (HMC) machine code

If the system is ordered with 1020 firmware level, or higher, and is capable to be HMC managed, then the managing HMC must be installed with HMC 10.1.1020.0, or higher.

This level only supports hardware appliance types 7063, or virtual appliances (vHMC) on x86 or PowerVM. The 7042 hardware appliance is not supported.

An HMC is required to manage the Power S1014 server implementing partitioning. Multiple Power8, Power9, and Power10 processor-based servers can be supported by a single HMC with version 10.

Planned HMC hardware and software support:

- Hardware Appliance: 7063-CR1, 7063-CR2
- vHMC on x86
- vHMC on PowerVM based LPAR

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

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

If a single HMC is attached to multiple servers, the HMC machine code level must be updated to be at or higher than the server with the most recent firmware level. All prior levels of server firmware are supported with the latest HMC machine code level.

For clients installing systems higher than the EIA 29 position (location of the rail that supports the rack-mounted server) in any IBM or non-IBM rack, acquire approved tools outlined in the server specifications section at [IBM Documentation](#).

In situations where IBM service is required and the recommended tools are not available, there could be delays in repair actions.

Software requirements

- Red Hat Enterprise Linux 9.0, for Power LE, or later
- Red Hat Enterprise Linux 8.4, for Power LE, or later
- SUSE Linux Enterprise Server 15 Service Pack 3, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later
- Red Hat OpenShift Container Platform 4.9, or later

Please review the Linux alert page for any known Linux issues or limitations [Linux on IBM - Readme first issues](#) website.

If installing IBM i:

- IBM i 7.5 and PTF SI80676, or later
- IBM i 7.4 TR6 and PTF SI80673, or later
- IBM i 7.3 TR12 and PTF SI80671, or later

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

- AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-02-2220, or later
- AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-04-2220, or later
- AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-06-2220, or later
(planned availability September 16, 2022)

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

- AIX Version 7.3 with the 7300-00 Technology Level and service pack 7300-00-01-2148, or later
- AIX Version 7.2 with the 7200-05 Technology Level and service pack 7200-05-01-2038, or later
- AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-02-2016 or later
- AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-06-2016, or later

If installing VIOS:

- VIOS 3.1.3.21

Publications

No publications are shipped with the announced product.

IBM Documentation 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. See [IBM Documentation](#).

To access the IBM Publications Center Portal, go to the [IBM Publications Center](#) website. The IBM 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.

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.

Features

Features - No charge

- NONE

Features - Chargeable

Special Features - Initial Orders

- Administrative

- (#BOPR) -SP Hard Drive/Media Retention - Power 5 years
- (#BOVH) -SP HDR/MR POWER 3Y
- (#ESC6) -S&H-b
- (#ESWK) -AIX Update Access Key (UAK)

- Editions

- (#EU2C) -Express Edition 4 core (IBM i)

- 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

- Linecards

- Manufacturing Instruction

- (#EFCQ) - I/O shipping consolidation

- Miscellaneous

- (#0444) -CBU Specify
- (#4926) -Solution Edition for IBM i (8-core)
- (#4928) -Solution Edition for IBM i (4-core)
- (#5000) -Software Preload Required
- (#9461) -Month Indicator
- (#9462) -Day Indicator
- (#9463) -Hour Indicator
- (#9464) -Minute Indicator
- (#9465) -Qty Indicator
- (#9466) -Countable Member Indicator

- (#EHSC) - Power Modernization Segment Indicator
- (#EHSD) - Power AIX Segment Indicator
- (#EHSE) - Power IBM i Segment Indicator
- Processor
 - (#2319) -Factory Deconfiguration of 1-core
- Services
 - (#0456) -Customer Specified Placement
 - (#B0VP) -SP Machine Setup Support for Power
 - (#EHSB) -IBM i HW/SW Bundle Solution Indicator
- Specify Codes
 - (#0205) -RISC-to-RISC Data Migration
 - (#4650) -Rack Indicator-Not Factory Integrated
 - (#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
 - (#5557) -System Console-Ethernet LAN adapter
 - (#9169) -Order Routing Indicator-System Plant
 - (#9440) -New AIX License Core Counter
 - (#9441) -New IBM i 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
 - (#ENSM) -Specify Code Configure all IBM i Namespaces
 - (#ESCZ) -iSCSI SAN Load Source Specify for AIX
- Standard Factory Services
 - (#4648) -Rack Integration Services: BP only

NOTE TO EDITORS - do NOT include feature 4648 in any EXTERNAL documentation

 - (#4649) -Rack Integration Services

- System Unit Base

Special Features - Plant and/or Field Installable

- Accessory
 - (#EU19) -Cable Ties & Labels
- Adapters
 - (#5899) -PCIe2 4-port 1GbE Adapter
 - (#EC2S) -PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
 - (#EC2U) -PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter
 - (#EC5B) -PCIe3 x8 1.6 TB NVMe Flash Adapter for AIX/Linux
 - (#EC5D) -PCIe3 x8 3.2 TB NVMe Flash Adapter for AIX/Linux
 - (#EC5F) -PCIe3 x8 6.4 TB NVMe Flash Adapter for AIX/Linux
 - (#EC66) -PCIe4 2-port 100Gb ROCE EN adapter
 - (#EC6K) -PCIe2 2-Port USB 3.0 Adapter
 - (#EC6V) -PCIe3 x8 1.6 TB NVMe Flash Adapter for IBM i
 - (#EC6X) -PCIe3 x8 3.2 TB NVMe Flash Adapter for IBM i
 - (#EC6Z) -PCIe3 x8 6.4 TB NVMe Flash Adapter for IBM i
 - (#EC72) - PCIe4 2-Port 25/10/1 GbE RoCE SFP28 Adapter
 - (#EC76) -PCIe4 2-port 100Gb No Crypto Connectx-6 DX QFSP56
 - (#EC78) -PCIe4 2-port 100Gb Crypto Connectx-6 DX QFSP56
 - (#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
 - (#EC7K) -PCIe4 1.6TB NVMe Flash Adapter x8 for IBM i
 - (#EC7M) -PCIe4 3.2TB NVMe Flash Adapter x8 for IBM i
 - (#EC7P) -PCIe4 6.4TB NVMe Flash Adapter x8 for IBM i
 - (#EJ0J) -PCIe3 RAID SAS Adapter Quad-port 6Gb x8
 - (#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
 - (#EJ2A) -PCIe4 x16 to CXP Converter Adapter (support AOC)
 - (#EJ2B) -PCIe3 12Gb x8 SAS Tape HBA Adapter
 - (#EJ32) -PCIe3 Crypto Coprocessor no BSC 4767
 - (#EJ33) -PCIe3 Crypto Coprocessor BSC-Gen3 4767
 - (#EJ35) -PCIe3 Crypto Coprocessor no BSC 4769
 - (#EJ37) -PCIe3 Crypto Coprocessor BSC-Gen3 4769
 - (#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
 - (#EN1A) -PCIe3 32Gb 2-port Fibre Channel Adapter
 - (#EN1C) -PCIe3 16Gb 4-port Fibre Channel Adapter
 - (#EN1E) -PCIe3 16Gb 4-port Fibre Channel Adapter
 - (#EN1G) -PCIe3 2-Port 16Gb Fibre Channel Adapter
 - (#EN1J) -PCIe4 32Gb 2-port Optical Fibre Channel Adapter
 - (#EN1L) -PCIe4 32Gb 4-port Optical Fibre Channel Adapter
 - (#EN1N) -PCIe4 64Gb 2-port Optical Fibre Channel Adapter

- (#EN2A) -PCIe3 16Gb 2-port Fibre Channel Adapter
- (#EN2L) - PCIe4 32Gb 4-port Optical Fibre Channel Adapter
- (#EN2N) -PCIe4 64Gb 2-port Optical Fibre Channel Adapter
- (#EN2W) -PCIe3 4-port 10GbE BaseT RJ45 Adapter
- Administrative
 - (#0719) -Load Source Not in CEC
 - (#EHS2) -SSD Placement Indicator - #ESLS/#ELLS
 - (#ESCO) -S&H - No Charge
 - (#ESCT) -Virtual Capacity Expedited Shipment
 - (#EVSN) -Enable Virtual Serial Number
- Cable
 - (#4242) -1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)
 - (#EB2J) -10m (30.3-ft) - IBM MTP 12 strand cable for 40/100G transceivers
 - (#EB2K) -30m (90.3-ft) - IBM MTP 12 strand cable for 40/100G transceivers
 - (#EB46) -10GbE Optical Transceiver SFP+ SR
 - (#EB47) -25GbE Optical Transceiver SFP28
 - (#EB49) -QSFP28 to SFP28 Connector
 - (#EB4J) -0.5m SFP28/25GbE copper Cable
 - (#EB4K) -1.0m SFP28/25GbE copper Cable
 - (#EB4M) -2.0m SFP28/25GbE copper Cable
 - (#EB4P) -2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE
 - (#EB57) -QSFP+ 40GbE Base-SR4 Transceiver
 - (#EB59) -100GbE Optical Transceiver 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)
 - (#ECBJ) -SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure
 - (#ECBK) -SAS X Cable 6m - HD Narrow 6Gb 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
 - (#ECBY) -SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure
 - (#ECBZ) -SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure
 - (#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)
- (#EDCL) -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)
- (#ECLS) -3.0M CXP x16 Copper Cable Pair for PCIe4 Expansion Drawer
- (#ECLX) -3.0M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer
- (#ECLY) -10M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer
- (#ECWO) -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

- (#1953) -300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
- (#1964) -600GB 10k RPM SAS SFF-2 HDD for AIX/Linux
- (#EL1P) -300GB 15k RPM SAS SFF-2 Disk Drive (Linux)
- (#EL1Q) -600GB 10k RPM SAS SFF-2 Disk Drive (Linux)
- (#ELEV) -600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
- (#ELF3) -1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
- (#ELFT) -1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
- (#ESEU) -571GB 10K RPM SAS SFF-HDD 4K for IBM i
- (#ESEV) -600GB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
- (#ESF2) -1.1TB 10K RPM SAS SFF-2 HDD 4K for IBM i
- (#ESF3) -1.2TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
- (#ESFS) -1.7TB 10K RPM SAS SFF-2 HDD 4K for IBM i
- (#ESFT) -1.8TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
- (#ESNL) -283GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)
- (#ESNM) -300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
- (#ESNQ) -571GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)
- (#ESNR) -600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
- (#ESRM) -300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)
- (#ESRR) -600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)

- Drive

- (#1107) -USB 500 GB Removable Disk Drive
- (#EU01) -1TB Removable Disk Drive Cartridge
- (#EU08) -RDX 320 GB Removable Disk Drive
- (#EU15) -1.5TB Removable Disk Drive Cartridge
- (#EU2T) -2TB Removable Disk Drive Cartridge (RDX)
- (#EUA0) -RDX USB Internal Docking Station
- (#EUA4) -RDX USB External Docking Station

- Linecards

- (#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/60A (48A derated) 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/30A (24A derated) Power Cord
- (#6655) -4.3m (14-Ft) 1PH/30A (24A derated) WR Power Cord
- (#6656) -4.3m (14-Ft) 1PH/32A Power Cord
- (#6657) -4.3m (14-Ft) 1PH/32A Power Cord-Australia
- (#6658) -4.3m (14-Ft) 1PH/30A (24A derated) 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
- (#ECJ6) -4.3m (14-Ft) PDU to Wall 3PH/40A 200-240V Power Cord
- (#ECJ7) -4.3m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power Cord
- (#ELC0) -PDU Access Cord 0.38m
- (#ELC1) -4.3m (14-Ft) PDU to Wall 24A 200-240V Power Cord North America
- (#ELC2) -4.3m (14-Ft) PDU to Wall 3PH/24A 415V Power Cord North America
- (#ELC5) -Power Cable - Drawer to IBM PDU (250V/10A)

- Manufacturing Instruction

- (#EJRL) -Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter
- (#EJRU) -Non-paired Indicator EJ0L PCIe SAS RAID Adapter
- (#EJW0) -Specify Mode-1 & CEC SAS Ports & (2)YO12 for EXP24SX #ESLS/ELS
- (#EJW1) -Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

- (#EJW2) -Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW3) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW4) -Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW5) -Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJW6) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJW7) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJWA) -Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS
- (#EJWB) -Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWC) -Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWD) -Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWE) -Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWF) -Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ELLS
- (#EJWG) -Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
- (#EJWH) -Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS
- (#EJWJ) -Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS

– Media Devices

- (#EUA5) -Standalone USB DVD drive w/cable

– Memory

- (#EM6N) -32GB (2x16GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory
- (#EM6W) -64 GB (2 x 32 GB) DDIMMs, 3200 MHz, 8 Gb DDR4 Memory
- (#EM6X) -128GB (2x64GB) DDIMMs, 3200 MHz, 16GBIT DDR4 Memory
- (#EM6Y) -256GB (2x128GB) DDIMMs, 2666 MHz, 16GBIT DDR4 Memory
- (#EMBP) -Active Memory Expansion

– Miscellaneous

- (#0004) -EMEA Bulk MES Indicator
- (#0098) -Special Manufacturing Operations Indicator
- (#1140) -Custom Service Specify, Rochester Minn, USA
- (#2145) -Primary OS - IBM i
- (#2146) -Primary OS - AIX
- (#2147) -Primary OS - Linux
- (#ECSM) -Custom Service Specify, Mexico
- (#ECSP) -Custom Service Specify, Poughkeepsie, USA
- (#EHKV) -SAP HANA TRACKING FEATURE
- (#EJ1Y) -Storage Backplane with eight NVMe U.2 drive slots
- (#EJUY) -IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side
- (#EJUZ) -OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side
- (#EJVY) -IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side
- (#EJVZ) -OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side
- (#EUOK) -Operator Panel LCD Display
- (#EU29) -Order Placed Indicator
- (#SVBP) -BP Post-Sale Services: 1 Day
- (#SVCS) -IBM Systems Lab Services Post-Sale Services: 1 Day
- (#SVNN) -Other IBM Post-Sale Services: 1 Day

– Power

- (#7109) -Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
- (#7188) -Power Distribution Unit

- (#7196) -Power Distribution Unit (US) - 1 EIA Unit, Universal, Fixed Power Cord
 - (#EB3S) -AC Titanium Power Supply - 1600W for Server (200-240 VAC)
 - (#EB3W) -AC Titanium Power Supply - 1200W for Server (100-127V/ 200-240V)
 - (#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
- (#EPF6) -One Processor Core Activation for EPG2
 - (#EPFT) -One Processor Core Activation for EPG0
 - (#EPFZ) -One Processor Core Activation for EPH8
 - (#EPG0) -4-core Typical 3.0 to 3.90 GHz (max) Power10 Processor
 - (#EPG2) -8-core Typical 3.00 to 3.90 GHz (max) Power10 Processor
 - (#EPH8) -24-core Typical 2.75 to 3.90 GHz (max) Power10 Processor
- Rack Related
- (#EB3Z) -Lift tool based on GenieLift GL-8 (standard)
 - (#EB4Z) -Service wedge shelf tool kit for EB3Z
 - (#EJUV) -Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount
 - (#EJUX) -Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount
 - (#EJXU) -Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount
 - (#EJXW) -Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount
 - (#EMX0) -PCIe Gen3 I/O Expansion Drawer
 - (#EMXH) -PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer
 - (#ENZ0) - PCIe Gen4 I/O Expansion Drawer
 - (#ENZF) - PCIe4 6-Slot Fanout Module for PCIe Gen4 I/O Expansion Drawer
 - (#EPTH) -Horizontal PDU Mounting Hardware
 - (#ERKZ) -Rack-Mount Rail Tower to Rack Conversion Kit
 - (#ESLS) -EXP24SX SAS Storage Enclosure
- Services
- (#0010) -One CSC Billing Unit
 - (#0011) -Ten CSC Billing Units
- Solid State Drive
- (#EC5V) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
 - (#EC5W) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
 - (#EC5X) -Mainstream 800 GB SSD PCIe3 NVMe U.2 module for AIX/ Linux
 - (#EC7T) -800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux
 - (#EKF2) -Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
 - (#EKF3) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
 - (#EKF4) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
 - (#EKF5) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux

- (#EKF6) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#EKF7) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#EKF8) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#EKF9) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ELV9) -ETK9 Load Source Specify (387 GB SSD SFF-2)
- (#ELVD) -ETKD Load Source Specify (775 GB SSD SFF-2)
- (#ELVH) -ETKH Load Source Specify (1.55 TB SSD SFF-2)
- (#ES1E) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#ES1F) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES1G) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#ES1H) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES1K) -Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES3A) -Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES3B) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#ES3C) -Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES3D) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#ES3E) -Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES3F) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
- (#ES3G) -Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES3H) -Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ES5A) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ES5B) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES5C) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ES5D) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES5E) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ES5F) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES5G) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
- (#ES5H) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
- (#ES94) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ES95) -387GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESB2) -387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESB6) -775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ESBA) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESBB) -387GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESBG) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESBH) -775GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESBL) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESBM) -1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESGV) -387GB Enterprise SAS 5xx SFF-2 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
- (#ESJ1) -931GB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJ2) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ3) -1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJ4) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ5) -3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i

- (#ESJ6) -7.45TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJ7) -7.45TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJJ) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJK) -931GB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJL) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJM) -1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJN) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJP) -3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESJQ) -7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESJR) -7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESK8) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESK9) -387GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESKC) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKD) -775GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESKG) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKH) -1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESKK) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKM) -931GB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESKP) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKR) -1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESKT) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKV) -3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESKX) -7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESKZ) -7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESMB) -931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESMD) -931GB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESMF) -1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESMH) -1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESMK) -3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESMS) -3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESMV) -7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
- (#ESMX) -7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
- (#ESNA) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESNB) -775GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ESNE) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ESNF) -1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ETK1) -387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ETK3) -775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
- (#ETK8) -387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ETK9) -387GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ETKC) -775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ETKD) -775GB Enterprise SAS 4k SFF-2 SSD for IBM i
- (#ETKG) -1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
- (#ETKH) -1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i

- Specify Codes

- (#0040) -Mirrored System Disk Level, Specify Code

- (#0041) -Device Parity Protection-All, Specify Code
- (#0047) -Device Parity RAID-6 All, Specify Code
- (#0265) -AIX Partition Specify
- (#0266) -Linux Partition Specify
- (#0267) -IBM i Operating System Partition Specify
- (#0296) -Specify Custom Data Protection
- (#0308) -Mirrored Level System Specify Code
- (#0347) -RAID Hot Spare Specify
- (#0837) -Fiber Channel SAN Load Source Specify
- (#5550) -Sys Console On HMC
- (#EB73) -IBM i 7.3 Indicator
- (#EB74) -IBM i 7.4 Indicator
- (#EB75) -IBM i 7.5 Indicator
- (#EHR2) -Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)
- (#EKLW) -EKF2 Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#EKLX) -EKF4 Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#EKLY) -EKF6 Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#EKLZ) -EKF8 Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#EL9D) -ESMD Load Source Specify (931GB SSD SFF-2)
- (#EL9H) -ESMH Load Source Specify (1.86TB SSD SFF-2)
- (#EL9S) -ESMS Load Source Specify (3.72TB SSD SFF-2)
- (#EL9X) -ESMX Load Source Specify (7.44TB SSD SFF-2)
- (#ELKM) -ESKM Load Source Specify (931GB SSD SFF-2)
- (#ELKR) -ESKR Load Source Specify (1.86TB SSD SFF-2)
- (#ELKV) -ESKV Load Source Specify (3.72TB SSD SFF-2)
- (#ELKZ) -ESKZ Load Source Specify (7.44TB SSD SFF-2)
- (#ELS3) -ES1F Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#ELSG) -ES1K Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#ELSQ) -ES1H Load Source Specify (3.2 TB 4K NVMe U.2 SSD for IBM i)
- (#ELTS) -#ESFS Load Source Specify (1.7TB HDD SFF-2)
- (#ELTU) -#ESEU Load Source Specify (571GB HDD SFF-2)
- (#ELU9) -ESK9 Load Source Specify (387GB SSD SFF-2)
- (#ELUD) -ESKD Load Source Specify (775GB SSD SFF-2)
- (#ELUH) -ESKH Load Source Specify (1.55TB SSD SFF-2)
- (#ELUK) -ESJK Load Source Specify (931GB SSD SFF-2)
- (#ELUL) -#ESNL Load Source Specify (283GB HDD SFF-2)
- (#ELUM) -ESJM Load Source Specify (1.86TB SSD SFF-2)
- (#ELUP) -ESJP Load Source Specify (3.72TB SSD SFF-2)
- (#ELUQ) -#ESNQ Load Source Specify (571GB HDD SFF-2)
- (#ELUR) -ESJR Load Source Specify (7.44TB SSD SFF-2)
- (#ELUW) -EC5W Load Source Specify (6.4 TB 4K NVMe U.2 SSD for IBM i)
- (#ELVK) -EC7K Load Source Specify (1.6TB SSD NVMe adapter for IBM i)
- (#ELVM) -EC7M Load Source Specify (3.2TB SSD NVMe adapter for IBM i)
- (#ELVP) -EC7P Load Source Specify (6.4TB SSD NVMe adapter for IBM i)
- (#ELYA) -ES3A Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
- (#ELYC) -ES3C Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

- (#ELYE) -ES3E Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
 - (#ELYG) -ES3G Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
 - (#ELZ5) -ES95 Load Source Specify (387GB SSD SFF-2)
 - (#ELZB) -ESNB Load Source Specify (775GB SSD SFF-2)
 - (#ELZF) -ESNF Load Source Specify (1.55TB SSD SFF-2)
 - (#ENS1) -188 GB IBM i NVMe Load Source Namespace size
 - (#ENS2) -393 GB IBM i NVMe Load Source Namespace size
 - (#ENSA) -200 GB IBM i NVMe Load Source Namespace size
 - (#ENSB) -400 GB IBM i NVMe Load Source Namespace size
 - (#ESLB) -ESBB Load Source Specify (387GB SSD SFF-2)
 - (#ESLH) -ESBH Load Source Specify (775GB SSD SFF-2)
 - (#ESLM) -ESBM Load Source Specify (1.55TB SSD SFF-2)
 - (#ESLV) -Load Source Specify for EC6V (NVMe 1.6 TB SSD for IBM i)
 - (#ESLX) -Load Source Specify for EC6X (NVMe 3.2 TB SSD for IBM i)
 - (#ESLZ) -Load Source Specify for EC6Z (NVMe 6.4 TB SSD for IBM i)
 - (#EU41) -ESJ1 Load Source Specify (931GB SSD SFF-2)
 - (#EU43) -ESJ3 Load Source Specify (1.86TB SSD SFF-2)
 - (#EU45) -ESJ5 Load Source Specify (3.72TB SSD SFF-2)
 - (#EU47) -ESJ7 Load Source Specify (7.45TB SSD SFF-2)
- System Unit Base
 - Virtualization Engine
 - (#5228) -PowerVM Enterprise Edition
 - (#EPV0) -Deactivation of LPM (Live Partition Mobility)
 - (#EPVT) -PowerVM Enterprise Edition
 - (#EPA0) -Deactivation of LPM (Live Partition Mobility)

Feature availability matrix

The following feature availability matrix for MT 9105 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.

4	A = AVAILABLE	S = SUPPORTED
1	N = NOT SUPPORTED,	MUST BE REMOVED
B		
FEAT/PN		DESCRIPTION
	-----	-----
0004	A	EMEA Bulk MES Indicator

0010 |A| One CSC Billing Unit
0011 |A| Ten CSC Billing Units
0040 |A| Mirrored System Disk Level, Specify Code
0041 |A| Device Parity Protection-All, Specify Code
0047 |A| Device Parity RAID-6 All, Specify Code
0098 |A| Special Manufacturing Operations Indicator
0205 |A| RISC-to-RISC Data Migration
0265 |A| AIX Partition Specify
0266 |A| Linux Partition Specify
0267 |A| IBM i Operating System Partition Specify
0296 |A| Specify Custom Data Protection
0308 |A| Mirrored Level System Specify Code
0347 |A| RAID Hot Spare Specify
0444 |A| CBU Specify
0456 |A| Customer Specified Placement
0719 |A| Load Source Not in CEC
0837 |A| Fiber Channel SAN Load Source Specify
1107 |A| USB 500 GB Removable Disk Drive
1140 |A| Custom Service Specify, Rochester Minn, USA
1953 |S| 300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)
1964 |S| 600GB 10k RPM SAS SFF-2 HDD for AIX/Linux
2145 |A| Primary OS - IBM i
2146 |A| Primary OS - AIX
2147 |A| Primary OS - Linux
2319 |A| Factory Deconfiguration of 1-core
4242 |S| 1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell
| |to 15-pin D-shell)
4649 |A| Rack Integration Services
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
4926 |A| Solution Edition for IBM i (8-core)
4928 |A| Solution Edition for IBM i (4-core)
5000 |A| Software Preload Required
5228 |A| PowerVM Enterprise Edition
5550 |A| Sys Console On HMC
5557 |A| System Console-Ethernet LAN adapter
5899 |A| PCIe2 4-port 1GbE Adapter
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/60A (48A derated) 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
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/30A (24A derated) Power Cord
6655 |A| 4.3m (14-Ft) 1PH/30A (24A derated) WR Power Cord
6656 |A| 4.3m (14-Ft) 1PH/32A Power Cord
6657 |A| 4.3m (14-Ft) 1PH/32A Power Cord-Australia
6658 |A| 4.3m (14-Ft) 1PH/30A (24A derated) 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)
7109 |S| Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
7188 |A| Power Distribution Unit
7196 |S| Power Distribution Unit (US) - 1 EIA Unit, Universal,
| |Fixed Power Cord
9169 |A| Order Routing Indicator- System Plant
9300 |A| Language Group Specify - US English
9440 |A| New AIX License Core Counter
9441 |A| New IBM i 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
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
ALH0 |A| Expert Care Indicator
B0PR |A| SP Hard Drive/Media Retention - Power 5 years
B0VH |A| SP HDR/MR POWER 3Y
B0VP |A| SP Machine Setup Support for Power
EB2J |A| 10m (30.3-ft) - IBM MTP 12 strand cable for 40/100G
| |transceivers
EB2K |A| 30m (90.3-ft) - IBM MTP 12 strand cable for 40/100G
| |transceivers
EB3S |A| AC Titanium Power Supply - 1600W for Server (200-240 VAC)
EB3W |A| AC Titanium Power Supply - 1200W for Server (100-127V/
| |200-240V)
EB3Z |A| Lift tool based on GenieLift GL-8 (standard)
EB46 |A| 10GbE Optical Transceiver SFP+ SR
EB47 |A| 25GbE Optical Transceiver SFP28
EB48 |A| 1GbE Base-T Transceiver RJ45
EB49 |A| QSFP28 to SFP28 Connector
EB4J |A| 0.5m SFP28/25GbE copper Cable
EB4K |A| 1.0m 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
EB57 |A| QSFP+ 40GbE Base-SR4 Transceiver
EB59 |A| 100GbE Optical Transceiver 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)
EB73 |A| IBM i 7.3 Indicator
EB74 |A| IBM i 7.4 Indicator

EB75	A IBM i 7.5 Indicator
EC2S	S PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter
EC2U	A PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter
EC5B	S PCIe3 x8 1.6 TB NVMe Flash Adapter for AIX/Linux
EC5D	S PCIe3 x8 3.2 TB NVMe Flash Adapter for AIX/Linux
EC5F	S PCIe3 x8 6.4 TB NVMe Flash Adapter for AIX/Linux
EC5V	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
EC5W	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
EC5X	S Mainstream 800 GB SSD PCIe3 NVMe U.2 module for AIX/Linux
EC66	A PCIe4 2-port 100Gb ROCE EN adapter
EC6K	A PCIe2 2-Port USB 3.0 Adapter
EC6V	S PCIe3 x8 1.6 TB NVMe Flash Adapter for IBM i
EC6X	S PCIe3 x8 3.2 TB NVMe Flash Adapter for IBM i
EC6Z	S PCIe3 x8 6.4 TB NVMe Flash Adapter for IBM i
EC72	A PCIe4 2-Port 25/10/1 GbE RoCE SFP28 Adapter
EC76	A PCIe4 2-port 100Gb No Crypto Connectx-6 DX QFSP56
EC78	A PCIe4 2-port 100Gb Crypto Connectx-6 DX QFSP56
EC7B	S PCIe4 1.6TB NVMe Flash Adapter x8 for AIX/Linux
EC7D	S PCIe4 3.2TB NVMe Flash Adapter x8 for AIX/Linux
EC7F	S PCIe4 6.4TB NVMe Flash Adapter x8 for AIX/Linux
EC7K	S PCIe4 1.6TB NVMe Flash Adapter x8 for IBM i
EC7M	S PCIe4 3.2TB NVMe Flash Adapter x8 for IBM i
EC7P	S PCIe4 6.4TB NVMe Flash Adapter x8 for IBM i
EC7T	A 800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux
ECBJ	A SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure
ECBK	S SAS X Cable 6m - HD Narrow 6Gb 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	S SAS YO Cable 10m - HD Narrow 6Gb 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
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 Y012 Cable (Adapter to Enclosure)
ECDU	A 3.0M SAS Y012 Cable (Adapter to Enclosure)

ECDV	A 4.5M SAS Y012 Active Optical Cable (Adapter to Enclosure)
ECDW	A 10M SAS Y012 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
ECJ6	A 4.3m (14-Ft) PDU to Wall 3PH/40A 200-240V 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
ECLS	A 3.0M CXP x16 Copper Cable Pair for PCIe4 Expansion Drawer
ECLX	A 3.0M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer
ECLY	A 10M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer
ECSM	A Custom Service Specify, Mexico
ECSP	A Custom Service Specify, Poughkeepsie, USA
ECW0	A Optical Wrap Plug
EFCQ	A I/O shipping consolidation
EHKV	S SAP HANA TRACKING FEATURE
EHR2	S Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)
EHS2	S SSD Placement Indicator - #ESLS/#ELLS
EHSB	A IBM i HW/SW Bundle Solution Indicator
EHSC	A Power Modernization Segment Indicator
EHSD	A Power AIX Segment Indicator
EHSE	A Power IBM i Segment Indicator
EJ0J	A PCIe3 RAID SAS Adapter Quad-port 6Gb x8
EJ0L	S PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8
EJ10	A PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8
EJ14	A PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8
EJ1Y	A Storage Backplane with eight NVMe U.2 drive slots
EJ2A	A PCIe4 x16 to CXP Converter Adapter (support AOC)
EJ2B	A PCIe3 12Gb x8 SAS Tape HBA Adapter
EJ32	S PCIe3 Crypto Coprocessor no BSC 4767
EJ33	S PCIe3 Crypto Coprocessor BSC-Gen3 4767
EJ35	A PCIe3 Crypto Coprocessor no BSC 4769
EJ37	A PCIe3 Crypto Coprocessor BSC-Gen3 4769

EJRL	A Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter
EJRU	S Non-paired Indicator EJ0L PCIe SAS RAID Adapter
EJUV	A Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount
EJUX	A Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount
EJUY	A IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side
EJUZ	A OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side
EJVY	A IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side
EJVZ	A OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side
EJW0	S Specify Mode-1 & CEC SAS Ports & (2)Y012 for EXP24SX #ESLS/ ELS
EJW1	S Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)Y012 for EXP24SX #ESLS/ELLS
EJW2	S Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS
EJW3	S Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
EJW4	S Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
EJW5	S Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
EJW6	S Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS
EJW7	S Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS
EJWA	S Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)Y012 for EXP24SX #ESLS/ELLS
EJWB	S Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
EJWC	S Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
EJWD	S Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS
EJWE	S Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS
EJWF	S Specify Mode-1 & (2)EJ14 & (2)Y012 for EXP24SX #ESLS/ELLS
EJWG	S Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
EJWH	S Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS
EJWJ	S Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS
EJXU	A Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount

EJXW	A Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount
EKF2	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
EKF3	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
EKF4	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
EKF5	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
EKF6	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
EKF7	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/ Linux
EKF8	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
EKF9	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux
EKLW	A EKF2 Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
EKLX	A EKF4 Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
EKLY	A EKF6 Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
EKLZ	A EKF8 Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
EL1P	S 300GB 15k RPM SAS SFF-2 Disk Drive (Linux)
EL1Q	S 600GB 10k RPM SAS SFF-2 Disk Drive (Linux)
EL9D	A ESMD Load Source Specify (931GB SSD SFF-2)
EL9H	A ESMH Load Source Specify (1.86TB SSD SFF-2)
EL9S	A ESMS Load Source Specify (3.72TB SSD SFF-2)
EL9X	A ESMX Load Source Specify (7.44TB SSD SFF-2)
ELC0	A PDU Access Cord 0.38m
ELC1	A 4.3m (14-Ft) PDU to Wall 24A 200-240V Power Cord North America
ELC2	A 4.3m (14-Ft) PDU to Wall 3PH/24A 415V Power Cord North America
ELC5	A Power Cable - Drawer to IBM PDU (250V/10A)
ELEV	S 600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ELF3	S 1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ELFT	S 1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096
ELKM	A ESKM Load Source Specify (931GB SSD SFF-2)
ELKR	A ESKR Load Source Specify (1.86TB SSD SFF-2)
ELKV	A ESKV Load Source Specify (3.72TB SSD SFF-2)
ELKZ	A ESKZ Load Source Specify (7.44TB SSD SFF-2)
ELS3	A ES1F Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

ELSG	A ES1K Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
ELSQ	A ES1H Load Source Specify (3.2 TB 4K NVMe U.2 SSD for IBM i)
ELT2	A #ESF2 Load Source Specify (1.1TB HDD SFF-2)
ELTS	A #ESFS Load Source Specify (1.7TB HDD SFF-2)
ELTU	A #ESEU Load Source Specify (571GB HDD SFF-2)
ELU9	A ESK9 Load Source Specify (387GB SSD SFF-2)
ELUD	A ESKD Load Source Specify (775GB SSD SFF-2)
ELUH	A ESKH Load Source Specify (1.55TB SSD SFF-2)
ELUK	S ESJK Load Source Specify (931GB SSD SFF-2)
ELUL	A #ESNL Load Source Specify (283GB HDD SFF-2)
ELUM	S ESJM Load Source Specify (1.86TB SSD SFF-2)
ELUP	S ESJP Load Source Specify (3.72TB SSD SFF-2)
ELUQ	A #ESNQ Load Source Specify (571GB HDD SFF-2)
ELUR	S ESJR Load Source Specify (7.44TB SSD SFF-2)
ELUW	A EC5W Load Source Specify (6.4 TB 4K NVMe U.2 SSD for IBM i)
ELV9	A ETK9 Load Source Specify (387 GB SSD SFF-2)
ELVD	A ETKD Load Source Specify (775 GB SSD SFF-2)
ELVH	A ETKH Load Source Specify (1.55 TB SSD SFF-2)
ELVK	S EC7K Load Source Specify (1.6TB SSD NVMe adapter for IBM i)
ELVM	S EC7M Load Source Specify (3.2TB SSD NVMe adapter for IBM i)
ELVP	S EC7P Load Source Specify (6.4TB SSD NVMe adapter for IBM i)
ELYA	A ES3A Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)
ELYC	A ES3C Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
ELYE	A ES3E Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
ELYG	A ES3G Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)
ELZ5	S ES95 Load Source Specify (387GB SSD SFF-2)
ELZB	S ESNB Load Source Specify (775GB SSD SFF-2)
ELZF	S ESNF Load Source Specify (1.55TB SSD SFF-2)
EM6N	A 32GB (2x16GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory
EM6W	A 64GB (2x32GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory
EM6X	A 128GB (2x64GB) DDIMMs, 3200 MHz, 16GBIT DDR4 Memory
EM6Y	A 256GB (2x128GB) DDIMMs, 2666 MHz, 16GBIT DDR4 Memory
EMBP	A Active Memory Expansion
EMX0	A PCIe Gen3 I/O Expansion Drawer
EMXA	A AC Power Supply Conduit 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
EN0S	S PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter
EN0U	S PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter
EN0W	A PCIe2 2-port 10/1GbE BaseT RJ45 Adapter
EN1A	A PCIe3 32Gb 2-port Fibre Channel Adapter
EN1C	A PCIe3 16Gb 4-port Fibre Channel Adapter
EN1E	A PCIe3 16Gb 4-port Fibre Channel Adapter
EN1G	A PCIe3 2-Port 16Gb Fibre Channel Adapter
EN1J	A PCIe4 32Gb 2-port Optical Fibre Channel Adapter
EN1L	A PCIe4 32Gb 4-port Optical Fibre Channel Adapter
EN1N	A PCIe4 64Gb 2-port Optical Fibre Channel Adapter
EN2A	A PCIe3 16Gb 2-port Fibre Channel Adapter
EN2L	A PCIe4 32Gb 4-port Optical Fibre Channel Adapter
EN2N	A PCIe4 64Gb 2-port Optical Fibre Channel Adapter
EN2W	A PCIe3 4-port 10GbE BaseT RJ45 Adapter
ENS1	S 188 GB IBM i NVMe Load Source Namespace size
ENS2	S 393 GB IBM i NVMe Load Source Namespace size
ENSA	A 200 GB IBM i NVMe Load Source Namespace size
ENSB	A 400 GB IBM i NVMe Load Source Namespace size
ENSM	A Specify Code Configure all IBM i Namespaces
ENZ0	A PCIe Gen4 I/O Expansion Drawer
ENZF	A PCIe4 6-Slot Fanout Module for PCIe Gen4 I/O Expansion Drawer
EPA0	A Deactivation of LPM (Live Partition Mobility)
EPF6	A One Processor Core Activation for EPG2
EPFT	A One Processor Core Activation for EPG0
EPFZ	A One Processor Core Activation for EPH8
EPG0	A 4-core Typical 3.0 to 3.90 Ghz (max) Power10 Processor
EPG2	A 8-core Typical 3.00 to 3.90 Ghz (max) Power10 Processor
EPH8	A 24-core Typical 2.75 to 3.90 GHz (max) Power10 Processor
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
EPV0	A Deactivation of LPM (Live Partition Mobility)
EPVT	A PowerVM Enterprise Edition
ERKZ	A Rack-Mount Rail Tower to Rack Conversion Kit
ES1E	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES1F	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
ES1G	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

ES1H	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
ES1K	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
ES3A	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
ES3B	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES3C	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
ES3D	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES3E	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
ES3F	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES3G	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
ES3H	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/ Linux
ES5A	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES5B	A Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i
ES5C	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES5D	A Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i
ES5E	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES5F	A Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i
ES5G	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux
ES5H	A Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i
ES94	S 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ES95	S 387GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESB2	S 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESB6	S 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESBA	S 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESBB	S 387GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESBG	S 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESBH	S 775GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESBL	S 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESBM	S 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
ESC0	S S&H - No Charge
ESC6	S S&H-b
ESCT	A Virtual Capacity Expedited Shipment
ESCZ	A iSCSI SAN Load Source Specify for AIX
ESEU	A 571GB 10K RPM SAS SFF- HDD 4K for IBM i
ESEV	A 600GB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
ESF2	S 1.1TB 10K RPM SAS SFF-2 HDD 4K for IBM i
ESF3	S 1.2TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
ESFS	S 1.7TB 10K RPM SAS SFF-2 HDD 4K for IBM i
ESFT	S 1.8TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux
ESGV	S 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESGZ	S 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESJ0	S 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

ESJ1	S 931GB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJ2	S 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ3	S 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJ4	S 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ5	S 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJ6	S 7.45TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJ7	S 7.45TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJJ	S 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJK	S 931GB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJL	S 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJM	S 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJN	S 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJP	S 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESJQ	S 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESJR	S 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESK1	S 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESK3	S 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ESK8	S 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESK9	S 387GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESKC	S 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESKD	S 775GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESKG	S 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESKH	S 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
ESKK	S 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESKM	S 931GB Mainstream SAS 4k SFF-2 SSD for IBM i
ESKP	S 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESKR	S 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESKT	S 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESKV	S 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESKX	S 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESKZ	S 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESLA	A Specify AC Power Supply for EXP12SX/EXP24SX Storage Enclosure
ESLB	S ESBB Load Source Specify (387GB SSD SFF-2)
ESLH	S ESBH Load Source Specify (775GB SSD SFF-2)
ESLM	S ESBM Load Source Specify (1.55TB SSD SFF-2)
ESLS	S EXP24SX SAS Storage Enclosure
ESLV	S Load Source Specify for EC6V (NVMe 1.6 TB SSD for IBM i)
ESLX	S Load Source Specify for EC6X (NVMe 3.2 TB SSD for IBM i)
ESLZ	S Load Source Specify for EC6Z (NVMe 6.4 TB SSD for IBM i)
ESMB	A 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESMD	A 931GB Mainstream SAS 4k SFF-2 SSD for IBM i

ESMF	A 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESMH	A 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESMK	A 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESMS	A 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESMV	A 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux
ESMX	A 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i
ESNA	S 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESNB	S 775GB Enterprise SAS 4k SFF-2 SSD for IBM i
ESNE	S 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ESNF	S 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
ESNL	A 283GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)
ESNM	A 300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
ESNQ	A 571GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)
ESNR	A 600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/ Linux)
ESRM	S 300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)
ESRR	S 600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)
ESWK	A AIX Update Access Key (UAK)
ETK1	A 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ETK3	A 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux
ETK8	A 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ETK9	A 387GB Enterprise SAS 4k SFF-2 SSD for IBM i
ETKC	A 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ETKD	A 775GB Enterprise SAS 4k SFF-2 SSD for IBM i
ETKG	A 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux
ETKH	A 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i
EU01	A 1TB Removable Disk Drive Cartridge
EU08	S RDX 320 GB Removable Disk Drive
EU0K	A Operator Panel LCD Display
EU15	S 1.5TB Removable Disk Drive Cartridge
EU19	A Cable Ties & Labels
EU29	A Order Placed Indicator
EU2C	A Express Edition 4 core (IBM i)
EU2T	A 2TB Removable Disk Drive Cartridge (RDX)
EU41	S ESJ1 Load Source Specify (931GB SSD SFF-2)
EU43	S ESJ3 Load Source Specify (1.86TB SSD SFF-2)
EU45	S ESJ5 Load Source Specify (3.72TB SSD SFF-2)
EU47	S ESJ7 Load Source Specify (7.45TB SSD SFF-2)
EUA0	A RDX USB Internal Docking Station
EUA4	S RDX USB External Docking Station
EUA5	A Standalone USB DVD drive w/cable

EVSN	A Enable Virtual Serial Number
EX23	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX
EX24	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX
EX25	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX
EX33	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX
EX34	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX
EX35	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX
EX43	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX
EX44	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX
EX45	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX
EX53	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX
EX54	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX
EX55	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX
EX63	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX
EX64	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX
EX65	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX
EX73	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX
EX74	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX
EX75	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX
EX83	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR COMMITTED FIX
EX84	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR COMMITTED FIX
EX85	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR

	COMMITTED FIX
EX93	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED
	FIX
EX94	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED
	FIX
EX95	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED
	FIX
EXA3	A 3 YEAR, ADVANCED EXPERT CARE
EXA4	A 4 YEAR, ADVANCED EXPERT CARE
EXA5	A 5 YEAR, ADVANCED EXPERT CARE
EXB3	A IBM Power Expert Care Basic 3 Year
EXB4	A IBM Power Expert Care Basic 4 Year
EXB5	A IBM Power Expert Care Basic 5 Year
EXF3	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR
	COMMITTED FIX
EXF4	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR
	COMMITTED FIX
EXF5	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR
	COMMITTED FIX
EXG3	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR
	COMMITTED FIX
EXG4	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR
	COMMITTED FIX
EXG5	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR
	COMMITTED FIX
EXH3	A 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR
	COMMITTED FIX
EXH4	A 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR
	COMMITTED FIX
EXH5	A 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR
	COMMITTED FIX
EXJ3	A 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR
	COMMITTED FIX
EXJ4	A 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR
	COMMITTED FIX
EXJ5	A 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR
	COMMITTED FIX
EXP3	A 3 YEAR, PREMIUM EXPERT CARE
EXP4	A 4 YEAR, PREMIUM EXPERT CARE
EXP5	A 5 YEAR, PREMIUM EXPERT CARE
SVBP	A BP Post-Sale Services: 1 Day

SVCS	A IBM Systems Lab Services Post-Sale Services: 1 Day
SVNN	A Other IBM Post-Sale Services: 1 Day

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 9105 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.

(#0004) - EMEA Bulk MES Indicator

NON-AAP BULK ORDER INDICATOR

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

(#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: No

(#0011) - Ten CSC Billing Units

Ten Billing Units used by the Customer Solutions Center.

- Attributes provided: Ten CSC Billing Units
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 100 (Initial order maximum: 100)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0040) - Mirrored System Disk Level, Specify Code

This code indicates the level of disk protection desired and helps ensure that adequate hardware is in the final configuration.

- Attributes provided: Device-level mirrored protection
- Attributes required: Minimum of two (2) disk units
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0041) - Device Parity Protection-All, Specify Code

This code indicates the level of disk protection desired and helps ensure that adequate hardware is in the final configuration.

- Attributes provided: RAID Data Protection
- Attributes required: RAID-capable disk unit controller
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0047) - Device Parity RAID-6 All, Specify Code

This code indicates the level of disk protection desired and helps ensure that adequate hardware is in the final configuration.

- Attributes provided: RAID-6 Data Protection
- Attributes required: RAID-6 capable disk unit controller
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0098) - Special Manufacturing Operations Indicator

This feature is a no-charge feature that indicates special manufacturing operations are to be performed.

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

(#0205) - RISC-to-RISC Data Migration

#0205 is used on initial orders to designate that the new server should only receive a partial load of IBM i in IBM Mfg.

When #0205 is on the order, manufacturing will only load SLIC and up through QSYS of IBM i. Ensure that enough storage is ordered to contain the additional OS code that will be loaded following installation of the system at the Client location. Specify code #0205 is mutually exclusive with #5000, SW Preload Required

The migration process requires that the installed model be at the same version and release level of IBM i and other licensed programs as the new server.

More information, and an updated IBM i Upgrade and Data Migration Road Map (RISC-RISC) are available at

<http://publib.boulder.ibm.com/iseries/>

- Attributes provided: Partial load of IBM i in IBM Mfg.
- Attributes required: #2145 - Primary OS - IBM i and partition specify code #0267 and RISC to RISC Data Migration from Clients existing system

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- 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: 160 (Initial order maximum: 160)
- OS level required:
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0266) - Linux Partition Specify

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

- Attributes provided: None
- Attributes required: Customers intend to create a partition on the system that will run the Linux operating system.
- Minimum required: 0
- Maximum allowed: 160 (Initial order maximum: 160)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0267) - IBM i Operating System Partition Specify

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

- Attributes provided: None
- Attributes required: Customers intend to create a partition on the system that will run the IBM i operating system.
- Minimum required: 0
- Maximum allowed: 160 (Initial order maximum: 160)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0296) - Specify Custom Data Protection

#0296 specifies that a system has multiple IBM i partitions and that data protection schemes should be considered separately for each partition instead of only for an overall system level. Each partition's data protection scheme can be different or the same.

- Attributes provided: N/A
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0308) - Mirrored Level System Specify Code

This specify code indicates the level of disk protection desired and helps ensure that adequate hardware is in the final configuration.

For new systems, the marketing configurator will show an error if sufficient disk units and disk controllers are not included on the order to support IOA-level mirroring protection. #0308 causes all disk units to be placed into configurations capable of IOA-level mirroring. Each disk unit and its mirrored pair must be on a different disk controller.

Note that the load source disk unit in a new, preloaded system will be device-level mirrored (same protection as provided with feature #0040). This means that the load source is controlled by the first disk unit controller on the first system bus, and will be mirrored with a like disk unit that is also attached to the same first disk controller on the first system bus.

For upgrade orders, #0308 will cause the marketing configurator to show an error if sufficient disk units and disk controllers are not available to provide the capability to enable IOA-level mirrored protection for all DASD.

It is the client's responsibility to start mirroring on their system.

- Attributes provided: IOA level system mirroring
- Attributes required: A minimum of two disk controllers and an even number of disk units (with a minimum of four disk units on a system).
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0347) - RAID Hot Spare Specify

#0347 is a specify code that indicates to IBM configuration tools and to IBM Manufacturing that RAID-5 or RAID-6 disk arrays should be further protected using the IBM i function of RAID hot spare. If specified, IBM will ship a configuration which has at least one stand- by disk drive for each disk controller in the system or designated partition. The customer may alter the hot spare configuration selecting different options once the system is installed.

- Attributes provided: N/A
- Attributes required: Existence of #0041 or #0047
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0444) - CBU Specify

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

- Attributes provided: Indicates the system has been registered for use as a CBU system for IBM i License entitlement purposes.
- Attributes required: # 2145 Primary OS - IBM i or #0267 IBM i Operating System Partition Specify
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A

- Return parts MES: Does not apply

(#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: None
 - Initial Order/MES/Both/Supported: Initial
 - CSU: N/A
 - Return parts MES: Does not apply

(#0719) - Load Source Not in CEC

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

- Attributes provided: System unit(s) are shipped with no disk units placed inside.
- Attributes required: Alternate load source specified
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#0837) - Fiber Channel 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: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#1107) - USB 500 GB Removable Disk Drive

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

- Attributes provided: 500 GB RDX rugged disk/cartridge
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

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

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

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

(#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 Power9/Power10 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#1964) - 600GB 10k RPM SAS SFF-2 HDD for 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.

Features #1962 and #1964 are physically identical drives with the same 19B3 CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #1964 indicates usage by AIX, Linux or VIOS. #1962 indicates usage by IBM i.

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 Power9/Power10 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#2145) - Primary OS - IBM i

Indicates clients intend to use the IBM i 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 IBM i operating system on the primary system partition.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2146) - Primary OS - AIX

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

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

(#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:
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#2319) - Factory Deconfiguration of 1-core

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

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#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: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- 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: Does not apply

(#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.

i 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. This server is not designed to be rack shippable.

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

(#4651) - Rack Indicator, Rack #1

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code

selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

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

(#4652) - Rack Indicator, Rack #2

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4653) - Rack Indicator, Rack #3

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4654) - Rack Indicator, Rack #4

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4655) - Rack Indicator, Rack #5

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4656) - Rack Indicator, Rack #6

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4657) - Rack Indicator, Rack #7

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4658) - Rack Indicator, Rack #8

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

- Attributes provided: Rack specify
- Attributes required: Rack
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None

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

(#4659) - Rack Indicator, Rack #9

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4660) - Rack Indicator, Rack #10

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

- Attributes provided: Rack specify

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

(#4661) - Rack Indicator, Rack #11

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4662) - Rack Indicator, Rack #12

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

For 19" rack orders: If IBM Mfg. is to assemble a rack mountable device into the rack, one feature code selection from the group 4651 to 4666 must be listed on the order. More than one feature code

selection from this group is not allowed. The quantity of this selected feature code on the 19" rack order must equal the number of rack mountable devices to be installed in the rack by IBM Mfg.

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

(#4663) - Rack Indicator, Rack #13

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.

i Note: For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4664) - Rack Indicator, Rack #14

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4665) - Rack Indicator, Rack #15

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4666) - Rack Indicator, Rack #16

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.

- i Note:** For 19" rack mountable device orders: One feature code from the group 4650 to 4666 must be listed on the order. More than one feature code from this group is not allowed.

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

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

(#4926) - Solution Edition for IBM i (8-core)

This feature defines to the configurator a select minimum configuration for a Solution Edition for IBM i (8-core) offering.

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

- i Note:** Mutually exclusive with feature #0444.

(#4928) - Solution Edition for IBM i (4-core)

This feature defines to the configurator a select minimum configuration for a Solution Edition for IBM i (4-core) offering.

- Attributes provided: Solution Edition for IBM i
- 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

(#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.

 **Note:** Not supported in Brazil and India.

- Attributes provided: Software Pre-load
- Attributes required: N/A
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#5228) - PowerVM Enterprise Edition

(No Longer Available as of November 10, 2023)

This feature allows the customer to create partitions that are in units of less than 1 CPU (sub-CPU LPARs) and allows the same system I/O to be virtually allocated to these partitions. When PowerVM is installed in the system, all activated processors must have the PowerVM feature. A fully activated 4-core system requires that four of this feature be ordered. An encrypted key is supplied to the customer and is installed on the system, authorizing the partitioning at the sub-processor level. PowerVM Enterprise Edition also includes Live Partition Mobility, which allows for the movement of a logical partition from one Power8, Power9 or Power10 with no application downtime.

 **Note:** If feature 5228 is ordered, the quantity ordered must be equal to the number of active processors.

- Attributes provided: Capability to partition processor
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Both

- CSU: Yes
- Return parts MES: No

(#5550) - Sys Console On HMC

With #5550, system console function is driven by the Hardware Management Console (HMC) connected to the system. The HMC is required if the following functions are desired/selected for the system:

- Attributes provided: System Console on Hardware Management Console(HMC)
- Attributes required: Hardware Management Console (HMC)
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#5557) - System Console-Ethernet LAN adapter

Indicates that the system console is driven by an Ethernet LAN adapter. This LAN adapter must be dedicated to console support functions and cannot be used for any other purpose.

- Attributes provided: System Console connection through an Ethernet LAN adapter
- Attributes required: Ethernet LAN adapter
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#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: 10 (Initial order maximum: 10)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

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

(#6460) - Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)

This power cord goes from the system or I/O drawer to the rack OEM power distribution unit or wall socket outlet. Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and plug type #4 (NEMA 5-15) on the other end.

The following countries/regions use the #6460 power cord to power the system and/or peripheral features requiring a power cord: United States, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Calicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Kitts/Nevis, St. Martin, Taiwan, Tortola (BVI), Trinidad/Tobago, Venezuela.

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

(#6469) - Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A) U. S.

This power cord goes from the system or I/O drawer to the wall or rack OEM power distribution unit. Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and plug type #5 (NEMA 6-15) on the other end for wall or OEM PDU.

The following countries/regions use the #6469 power cord to power the system and/or peripheral features requiring a power cord:

United States, Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Caicos Is., Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Marten NA, Taiwan, Tortola (BVI), Thailand, Venezuela.

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

(#6470) - Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #4 (NEMA 5-15). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. 6-foot length.

The following countries/regions use the #6470 power cord to power the system and/or peripheral features requiring a power cord:

United States, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Calicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia, Montserrat, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, St. Kitts/Nevis, St. Martin, Taiwan, Tortola (BVI), Trinidad/Tobago, Venezuela.

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

(#6471) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #73 (InMetro NBR 14136). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6471 power cord to power the system and/or peripheral features requiring a power cord:

Brazil

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

(#6472) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #18 (CEE 7 VII). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6472 power cord to power the system and/or peripheral features requiring a power cord:

Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Belarus, Belgium, Benin, Bosnia/Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, 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: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6473) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #19 (CEE). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6473 power cord to power the system and/or peripheral features requiring a power cord:

Denmark

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

(#6474) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/13A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #23 (BS 1364A). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6474 power cord to power the system and/or peripheral features requiring a power cord:

Abu Dhabi, Bahrain, Botswana, Brunei, Channel Islands, Cyprus, Dominica, Gambia, Grenada, Grenadines, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar, 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: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6475) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #32 (SII 32-1971). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6475 power cord to power the system and/or peripheral features requiring a power cord:

Israel

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

(#6476) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #24 (SEV 24507). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6476 power cord to power the system and/or peripheral features requiring a power cord:

Lichtenstein, Switzerland

- Attributes provided: Power cord
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both

- CSU: Yes
- Return parts MES: No

(#6477) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #22 (SABS 164). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6477 power cord to power the system and/or peripheral features requiring a power cord:

Bangladesh, LeSotho, Maceo, Maldives, Nambia, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda.

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

(#6478) - Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #25 (CEI 23-16). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6478 power cord to power the system and/or peripheral features requiring a power cord: Chile Italy Libya

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

(#6488) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (125V/15A or 250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. 125V, 15A or 250V, 10A, Plug Type #2. Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6488 power cord to power the system and/or peripheral features requiring a power cord:

Argentina, Paraguay, Uruguay.

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

(#6489) - 4.3m (14-Ft) 3PH/32A 380-415V Power Cord

#6489 is a 14-FT/4.3m 3PH/32A power cable with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

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

(#6491) - 4.3m (14-Ft) 1PH/63A 200-240V Power Cord

#6491 is a 14-FT/4.3m 200-240V/63A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

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

(#6492) - 4.3m (14-Ft) 1PH/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: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6493) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #62 (GB 1053). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6493 power cord to power the system and/or peripheral features requiring a power cord:

People's Republic of China.

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

(#6494) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #69 (IS 6538). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6494 power cord to power the system and/or peripheral features requiring a power cord:

India

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

(#6496) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #66 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following

countries/regions use the #6496 power cord to power the system and/or peripheral features requiring a power cord: North Korea South Korea

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

(#6577) - Power Cable - Drawer to IBM PDU, 200-240V/10A

This feature permits manufacturing to select the optimum PDU power jumper cord length (1.0M, 2.0M, 2.7M, or 4.3M) for rack integration. This feature is mandatory on initial order specifying factory integration with IBM racks (such as with 7965-S42 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).

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

i 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.

(#6651) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #75 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6651 power cord to power the system and/or peripheral features requiring a power cord: Taiwan

- Attributes provided: Power cord
- Attributes required: None

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

(#6653) - 4.3m (14-Ft) 3PH/16A 380-415V Power Cord

#6653 is a 14-FT/4.3m 3PH/16A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

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

(#6654) - 4.3m (14-Ft) 1PH/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: None
- 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: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#6656) - 4.3m (14-Ft) 1PH/32A Power Cord

#6656 is a 14-FT/4.3m 200-240V/32A power cord with a Type 46 plug which distributes power from a power source to a Power Distribution Unit.

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

(#6657) - 4.3m (14-Ft) 1PH/32A Power Cord-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: None
- 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: PDU power cable
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#6659) - Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #76 (KETI). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. The following countries/regions use the #6659 power cord to power the system and/or peripheral features requiring a power cord: Taiwan

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

(#6660) - Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/15A)

This power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #59 (NEMA 5-15). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types. 14-foot length.

This power cord meets the DENAN marking requirement in Japan.

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

(#6665) - Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)

Standard IBM rack power jumper cord that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C20 on the other end (for IBM PDU C19 receptacle).

i Note: For power jumper cord which attach to PDUs with C13 receptacles, use features such as #6577, #6458, #6671, or #6672.

- Attributes provided: Power jumper cord.
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)

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

(#6667) - 4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia

#6667 is a 14-FT/4.3m 380-45V/32A power cord with a Type PDL plug which distributes power from a power source to a Power Distribution Unit.

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

(#6671) - Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A

Standard IBM rack power cable that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for IBM PDU C13 receptacle). Note for different length C13/C14 cables see #6458 (4.3M) or #6672 (2.0M).

- Attributes provided: Power jumper cord.
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both

- CSU: Yes
- Return parts MES: No

(#6672) - Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A

Standard rack power cable that goes from the system or I/O drawer to the rack power distribution unit (PDU). Cable has C13 on one end (for C14 power supply connector on system unit or I/O drawer) and C14 on the other end (for IBM PDU C13 receptacle). Note for different length C13/C14 cables see #6458 (4.3M) or #6671 (2.7M).

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

(#6680) - Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)

This insulated power cord goes from the system and/or peripheral features to a wall-type outlet. Plug type #6 (AS 3112-1964 NZS 198). Refer to Corporate Bulletin C-B-2-4700-009 for a description of plug types.

The following countries/regions use the #6680 power cord to power the system and/or peripheral features requiring a power cord:

Australia, Fiji Islands, Kiribati, Nauru, New Zealand, Papua New Guinea, W. Samoa.

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

(#7109) - Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector

This feature is for an intelligent AC power distribution unit (PDU+) that will allow the user to monitor the amount of power being used by the devices that are plugged in to this PDU+. This AC power distribution unit provides twelve C13 power outlets. It receives power through a UTG0247 connector. It can be used for many different countries and applications by varying the PDU to Wall Power Cord, which must be ordered separately. Each PDU requires one PDU to Wall Power Cord. Supported power cords include the following features: #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, #ELC1 or #ELC2.

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Twelve C13 outlets with Power Monitoring Capability
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#7188) - Power Distribution Unit

An AC Power Distribution Unit (PDU) which mounts in a 19" rack and provides twelve C13 power outlets. The #7188 has six 16A circuit breakers, with two power outlets per circuit breaker. System units and/or expansion units must use a power cord with a C14 plug to connect to the #7188.

One of the following line cords must be used to distribute power from a wall outlet to the #7188; #6489, #6491, #6492, #6653, #6654, #6655, #6656, #6657, #6658, #ELC1 or #ELC2.

- Attributes provided: Power Distribution Unit with Twelve C13 power outlets.
- Attributes required: none
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#7196) - Power Distribution Unit (US) - 1 EIA Unit, Universal, Fixed Power Cord

This AC power distribution unit provides six C19 power outlets. Fixed power cord (IEC309 60A plug (3P+G). This PDU requires 3-phase electrical service.

Limitation: Some configurations of the Elastic Storage Server (ESS) are delivered with a Intelligent PDU. At this time, the intelligent management capabilities of this PDU are not configured or used by the ESS system. If the ESS Customer would like to use this capability, it is the Customers responsibility to configure this PDU. In any case the ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

- Attributes provided: Six C19 power outlets
- Attributes required: 3 phase electrical service
- Minimum required: 0

- Maximum allowed: 9999 (Initial order maximum: 0)
- OS level required: None
- 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: None
- 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: None
- 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: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A

- Return parts MES: Does not apply

(#9441) - New IBM i License Core Counter

This feature is used to count the number of cores licensed to run IBM i.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9442) - New Red Hat License Core Counter

This feature is used to count the number of cores licensed to run Red Hat Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9443) - New SUSE License Core Counter

This feature is used to count the number of cores licensed to run SUSE Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9444) - Other AIX License Core Counter

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: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9445) - Other Linux License Core Counter

This feature is used to count the number of existing Linux licenses transferred from another server.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

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

This feature is used to count the number of cores licensed to run 3rd party Linux.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9447) - VIOS Core Counter

This feature is used to count the number of cores licensed to run VIOS (Virtual I/O Server).

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

Do NOT include feature 9448 in any EXTERNAL documentation**(#9448) - Other IBM i License Core Counter**

This feature is used to count the number of existing IBM i licenses transferred from another server.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#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: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9461) - Month Indicator

This month indicator is used to create a date stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 12 (Initial order maximum: 12)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9462) - Day Indicator

This day indicator is used to create a date stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity

ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 31 (Initial order maximum: 31)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9463) - Hour Indicator

This hour indicator is used to create a time stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9464) - Minute Indicator

This hour indicator is used to create a time stamp to enable CFR splitting and rejoining in order to circumvent the AAS maximum limitation of 30 systems entered on any one order. The quantity ordered for this feature is generated by eConfig.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 60 (Initial order maximum: 60)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9465) - Qty Indicator

This quantity indicator is used to specify the remaining, or N-1 quantity of CFR entities that need to be accumulated for rejoining. The quantity ordered for this feature is generated by eConfig and is equal to N-1, where 'N' equals the total quantity of CFRs being rejoined.

- Attributes provided: None

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

(#9466) - Countable Member Indicator

This administrative indicator used to identify each CFR associated with a date/time stamp that is eligible for splitting and rejoining. The quantity ordered for this feature is generated by eConfig.

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

(#9700) - Language Group Specify - Dutch

Dutch language group for Nomenclature and Standard Publications.

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

(#9703) - Language Group Specify - French

French language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A

- Return parts MES: Does not apply

(#9704) - Language Group Specify - German

German language group for Nomenclature and Standard Publications.

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

(#9705) - Language Group Specify - Polish

Polish language group for Nomenclature and Standard Publications.

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

(#9706) - Language Group Specify - Norwegian

Norwegian language group for Nomenclature and Standard Publications.

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

(#9707) - Language Group Specify - Portuguese

Portuguese language group for Nomenclature and Standard Publications.

- Attributes provided: None
- Attributes required: None

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

(#9708) - Language Group Specify - Spanish

Spanish language group for Nomenclature and Standard Publications.

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

(#9711) - Language Group Specify - Italian

Italian language group for Nomenclature and Standard Publications.

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

(#9712) - Language Group Specify - Canadian French

Canadian French language group for Nomenclature and Standard Publications.

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

(#9714) - Language Group Specify - Japanese

Japanese language group for Nomenclature and Standard Publications.

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

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

Traditional Chinese language group for Nomenclature and Standard Publications.

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

(#9716) - Language Group Specify - Korean

Korean language group for Nomenclature and Standard Publications.

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

(#9718) - Language Group Specify - Turkish

Turkish language group for nomenclature and publications.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)

- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#9719) - Language Group Specify - Hungarian

Hungarian language group for Nomenclature and Standard Publications.

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

(#9720) - Language Group Specify - Slovakian

Slovakian language group for Nomenclature and Standard Publications.

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

(#9721) - Language Group Specify - Russian

Russian language group for nomenclature and standard publications.

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

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

Simplified Chinese language group for nomenclature and standard publications.

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

(#9724) - Language Group Specify - Czech

Czech language group for nomenclature and standard publications.

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

(#9725) - Language Group Specify - Romanian

Romanian language group for Nomenclature and Standard Publications.

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

(#9726) - Language Group Specify - Croatian

Croatian language group for Nomenclature and Standard Publications.

- Attributes provided: Language specify
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A

- Return parts MES: Does not apply

(#9727) - Language Group Specify - Slovenian

Slovenian language group for Nomenclature and Standard Publications.

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

(#9728) - Language Group Specify - Brazilian Portuguese

Brazilian Portuguese language group for Nomenclature and Standard Publications.

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

(#9729) - Language Group Specify - Thai

Thai language group for Nomenclature and Standard Publications.

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

(#ALH0) - Expert Care Indicator

This feature indicates the Expert Care Service and Support offering is included on the order. It is for administrative purposes only.

- Minimum required: 0

- Maximum allowed: 255 (Initial order maximum: 255)
- OS level required: None
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#BOPR) - SP Hard Drive/Media Retention - Power 5 years

This feature indicates ServicePac Hard Drive/Media Retention - Power 5 years

- 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

(#BOVH) - SP HDR/MR POWER 3Y

ServicePac for Hard Drive or Media Retention for Power 3 years

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

(#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

(#EB2J) - 10m (30.3-ft) - IBM MTP 12 strand cable for 40/100G transceivers

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 MTP 12 strand cable for 40/100G transceivers

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

(#EB3S) - AC Titanium Power Supply - 1600W for Server (200-240 VAC)

This feature provides a 200 - 240V, 1600 watt AC titanium power supply.

The titanium power supply is configured in a one plus one for a 2U server or two plus two for a 4U server configuration to provide redundancy. Supported in rack models only.

To be operational, a minimum power supply in the CEC base enclosure is required. If there is a power supply failure, any of the power supplies can be exchanged without interrupting the operation of the system.

This power supply is not supported on all models.

- Attributes provided: AC Titanium Power Supply
- Attributes required: Supported on rack model only. Requires input voltage of 200-240 VAC
- 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

(#EB3W) - AC Titanium Power Supply - 1200W for Server (100-127V/200-240V)

This feature provides a 100-127V/200-240V, 1200 watt AC titanium power supply.

The titanium power supply is configured in a two plus two for a 4U server configuration to provide redundancy. Supported in rack and tower models.

To be operational, a minimum power supply in the CEC base enclosure is required. If there is a power supply failure, any of the power supplies can be exchanged without interrupting the operation of the system.

This power supply is not supported on all models.

- Attributes provided: AC Titanium Power Supply
- Attributes required: Supported on rack and tower model. Requires input voltage of 100-127V/200-240V.
- 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 Power8, Power9 and Power10 as well as 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.

The feature EB3Z is not orderable in the following countries/ regions: Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, Oman, Egypt, Jordan, Morocco, Albania, Bulgaria, Croatia, Greece, Slovakia, Slovenia, Montenegro, Serbia, Ukraine, and Taiwan.

- 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) - 10GbE 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) - 25GbE 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

(#EB48) - 1GbE Base-T Transceiver RJ45

One 1GbE Base-T RJ45 transceiver for 25/10Gb Ethernet adapter such as features EC2U or EC2T. Does not include cable. The 1GbE Base-T RJ45 transceiver uses CAT5E STP cable up to 100m.

The transceiver can be plugged into the SFP28 port of EC2U or EC2T in order to provide a 1GbE Base-T RJ45 connection. Either one or both of the adapter's two SFP ports can be populated.

Limitations:

- SRIOV or RoCE capabilities are not supported on the EC2U or EC2T adapters using this feature EB48.

- Feature EB48 cannot be used with Feature EB46 - 10GbE Optical Transceiver SFP+ SR or EB47 - 25GbE Optical Transceiver SFP28.
- Attributes provided: 1Gb RJ45 transceiver
- 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

(#EB49) - QSFP28 to SFP28 Connector

This feature provides a QSFP28 to SFP28 connector which enables connections between a single lane transceiver/cable and a quad-lane port. The QSA28 provides the option to connect an SFP28 transceiver or cable to a QSFP28 port 100 Gb/s switch or network card.

The adapter has a QSFP28 form factor with a receptacle for an SFP28 transceiver/AOC/DAC connector. The QSA28 interoperates with all major optical modules and direct attached copper cable. Its design assures minimum loss on the conversion path between the QSFP28 cage and the SFP28 receptacle.

The QSFP28 to SFP28 connector is qualified for 10GbE SFP+ and 1GbE SFP transceivers meeting the Small Form Factor Pluggable (SFP) Transceiver Multi-source Agreement (MSA).

i Note: This feature is only available through Offering Management approval, contact douglasg@ca.ibm.com or bbarnett@us.ibm.com for authorization.

- Attributes provided: QSFP28 to SFP28 Adapter
- 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

(#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

(#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.

- i 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.

The feature EB4Z is not orderable in the following countries/ regions: Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, Oman, Egypt, Jordan, Morocco, Albania, Bulgaria, Croatia, Greece, Slovakia, Slovenia, Montenegro, Serbia, Ukraine, and Taiwan.

- 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

(#EB57) - QSFP+ 40GbE Base-SR4 Transceiver

IBM QSFP+ optical base-SR4 transceiver required for 40 Gbps ports which are not using copper QSFP+ transceiver.

The QSFP+ 40GbE Base-SR4 Transceiver is designed to deliver the following functions:

- Hot-swappable input/output device that plugs into a 40 Gigabit Ethernet QSFP port
- Interoperable with other IEEE-compliant 40GBASE interfaces where applicable
- High-speed electrical interface compliant to the IEEE 802.3ba standard
- QSFP Form factor, 2-wire I2C communication interface and other low-speed electrical interface compliant to SFF 8436 and QSFP Multisource Agreement (MSA)
- Attributes provided: QSFP+ transceiver for 40 Gbs ports
- Attributes required: None
- Minimum required: 0

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

(#EB59) - 100GbE 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

(#EB5K) - 1.0M 100GbE Copper Cable QSFP28

1.0 meter length passive copper cable with QSFP28 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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 transceivers 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

(#EB73) - IBM i 7.3 Indicator

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

- Attributes provided: IBM i 7.3 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - IBM i 7.3 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB74) - IBM i 7.4 Indicator

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

- Attributes provided: IBM i 7.4 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - IBM i 7.4 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EB75) - IBM i 7.5 Indicator

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

- Attributes provided: IBM i 7.5 Indicator
- Attributes required: IBM i operating system
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - IBM i 7.5 supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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

For SR-IOV FAQs visit <https://community.ibm.com/community/user/power/viewdocument/sr-iov-faqs-test?CommunityKey=71e6bb8a-5b34-44da-be8b-277833a383b0&tab=librarydocuments#Q3>

- Attributes provided: 2-port 10Gb Ethernet Adapter
- Attributes required: Full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 0)
- OS level required:
 - IBM i supported

- AIX supported
- Red Hat Enterprise Linux 9.0, for Power LE, or later
- Red Hat Enterprise Linux 8.4, for Power LE, or later, with Mellanox OFED 5.5, or later
- SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later, with Mellanox OFED 5.5, or later
- Red Hat OpenShift Container Platform 4.9

NOTES:

- IBM i supports dedicated driver for the NIC function
- IBM i supports native SR-IOV for the NIC function
- IBM i 7.4 or later also adds support for dedicated ROCE and native SR-IOV ROCE, which are used only by IBM Db2 Mirror for i.
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

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

(No longer available as of May 13, 2024)

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.

For 1GbE, IBM qualifies and supports the 1GbE Base-T Transceiver RJ45 (FC EB48) for 25/10Gb Ethernet adapter (features EC2U or EC2T). The 1GbE Base-T RJ45 transceiver uses CAT5E STP cable up to 100m (does not include cable). The transceiver can be plugged into the SFP28 port of the adapter in order to provide a 1GbE Base-T RJ45 connection.

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

For SR-IOV FAQs visit <https://community.ibm.com/community/user/power/viewdocument/sr-iov-faqs-test?CommunityKey=71e6bb8a-5b34-44da-be8b-277834a183b0&tab=librarydocuments#Q3>

- Attributes provided: 2-port 25/10Gb Ethernet Adapter
- Attributes required: Full high PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
 - IBM i supported
 - AIX supported
 - Red Hat Enterprise Linux 9.0, for Power LE, or later

- Red Hat Enterprise Linux 8.4, for Power LE, or later, with Mellanox OFED 5.5, or later
- SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later, with Mellanox OFED 5.5, or later
- Red Hat OpenShift Container Platform 4.9

NOTES:

- IBM i supports dedicated driver for the NIC function
- IBM i supports native SR-IOV for the NIC function
- IBM i 7.4 or later also adds support for dedicated ROCE and native SR-IOV ROCE, which are used only by IBM Db2 Mirror for i.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

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

(No Longer Available as of May 12, 2023)

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.

i Note: NVMe Flash adapters #EC5B can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 32 namespaces per device.

- 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: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ.
 - Assignment to the VIOS supported

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

(No Longer Available as of May 12, 2023)

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.

- i Note:** NVMe Flash adapters #EC5D can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 32 namespaces per device.

- 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: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).
 - Assignment to the VIOS supported

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

(No Longer Available as of May 12, 2023)

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.

- i Note:** NVMe Flash adapters #EC5F can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 32 namespaces per device.

- 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: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ.
 - Assignment to the VIOS supported

(#EC5V) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EC5V and #EC5W are physically identical drives with the same CCIN of 59BA. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EC5V

indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EC5W indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EC5W) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EC5V and #EC5W are physically identical drives with the same CCIN of 59BA. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EC5V

indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EC5W indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EC5X) - Mainstream 800 GB SSD PCIe3 NVMe U.2 module for AIX/Linux

Mainstream 800 GB NVMe SFF U.2 7mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 3 (Gen3) drive. The SSD can be used in any U.2 7mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Feature #EC5X has CCIN of 59B7. Feature EC5X indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors.

This Mainstream solid-state drive is rated at 2.4 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

- Attributes provided: 800 GB low latency flash memory
- Attributes required: SFF U.2 15mm
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i not supported
 - IBM i does not support this feature through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

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

(No longer available as of January 12, 2024)

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 30M in length (feature #EB2J or #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 30M in length (feature #EB2J or #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
- PowerVM SR-IOV support

For SR-IOV FAQs visit <https://community.ibm.com/community/user/power/viewdocument/sr-iov-faqs-test?CommunityKey=71e6bb8a-5b34-44da-be8b-277834a183b0&tabId=librarydocuments#Q3>

- Attributes provided: Dual-port 100 GbE Adapter with RoCE capability
- Attributes required: Available Gen4 PCIe Slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
 - AIX supported
 - Red Hat Enterprise Linux 9.0, for Power LE, or later
 - Red Hat Enterprise Linux 8.4, for Power LE, or later, with Mellanox OFED 5.5, or later
 - SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later, with Mellanox OFED 5.5, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later, with Mellanox OFED 5.5, or later
 - Red Hat OpenShift Container Platform 4.9

NOTES:

- IBM i supports dedicated driver for the NIC function
- IBM i supports native SR-IOV for the NIC function
- IBM i 7.4 or later also adds support for dedicated ROCE and native SR-IOV ROCE, which are used only by IBM Db2 Mirror for i.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).
 - Assignment to the VIOS supported

(#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: 9 (Initial order maximum: 9)
- OS level required:
 - IBM i supported
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EC6V) - PCIe3 x8 1.6 TB NVMe Flash Adapter for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC6U, and EC6V are the same adapter with different feature codes. Feature EC6U is low-profile adapter and feature EC6V is full-height adapters. Features EC6U and EC6V are supported by IBM i.

CCIN is 58FC.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 32 namespaces per device.

- Attributes provided: PCIe3 x8 NVMe 1.6 TB with full-height tailstock
- Attributes required: PCIe slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC6X) - PCIe3 x8 3.2 TB NVMe Flash Adapter for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC6W, and EC6X are the same adapter with different feature codes. Feature EC6W is low-profile adapter and feature EC6X is full- height adapters. Features EC6W and EC6X are supported by IBM i.

CCIN is 58FD.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 32 namespaces per device.

- Attributes provided: PCIe3 x8 NVMe 3.2 TB with full-height tallstock
- Attributes required: PCIe slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC6Z) - PCIe3 x8 6.4 TB NVMe Flash Adapter for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC6Y, and EC6Z are the same adapter with different feature codes. Feature EC6Y is low-profile adapter and feature EC6Z is full-height adapter. Features EC6Y and EC6Z are supported by IBM i.

CCIN is 58FE.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 32 namespaces per device.

- Attributes provided: PCIe3 x8 NVMe 6.4 TB with full-height tailstock
- Attributes required: PCIe slot
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 0)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC72) - PCIe4 2-Port 25/10/1 GbE RoCE SFP28 Adapter

This PCIe Gen4 Ethernet adapter provides two 25/10/1GbE 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.

For 1GbE, IBM qualifies and supports the 1GbE Base-T Transceiver RJ45 (FC EB48) for 25/10Gb Ethernet adapter (features EC71 or EC72). The 1GbE Base-T RJ45 transceiver uses CAT5E STP cable up to 100m (does not include cable). The transceiver can be plugged into the SFP28 port of the adapter in order to provide a 1GbE Base-T RJ45 connection.

Feature code #EC71 and #EC72 have identical electronics and function and CCIN (2CF9), but have different tail stock brackets. #EC71 is low profile and #EC72 is full high. The adapter is based on a Mellanox ConnectX-6 adapter which uses a ConnectX-6 Lx EN Network Controller.

Attributes:

- PCI Express 4.0 (up to 16GT/s) x8
- PCIe Gen 4.0 compliant, 1.1, 2.0, and 3.0 compatible
- RDMA over Converged Ethernet (RoCE)
- NIC and RoCE are concurrently supported
- 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
- AIX Network Installation Manager (NIM) boot support
- PowerVM SR-IOV support

For SR-IOV FAQs visit <https://community.ibm.com/community/user/power/viewdocument/sr-iov-vnic-and-hnv-information?CommunityKey=71e6bb8a-5b34-44da-be8b-277834a183b0&tab=librarydocuments>

- Attributes provided: 2-port 25Gb Ethernet
- Attributes required: Available Gen4 PCIe Slot
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
 - Red Hat Enterprise Linux 9.2, or later, with Mellanox OFED 23.04, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later, with Mellanox OFED 23.04, or later
 - Red Hat Enterprise Linux 8.8, or later, with Mellanox OFED 23.10, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.8, or later, with Mellanox OFED 23.10, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later, with Mellanox OFED 23.04, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later, with Mellanox OFED 23.04, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-07-2346, or later
 - AIX Version 7.3 with the 7300-02 Technology Level and Service Pack 7300-02-01-2346, or later
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-03-2346, or later (Planned Availability January 26, 2024)
 - IBM i 7.5 TR3, or later
 - IBM i 7.4 TR9, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS requires:

- VIOS 3.1.4.30, or later
- VIOS 4.1.0.10, or later

(#EC76) - PCIe4 2-port 100Gb No Crypto Connectx-6 DX QFSP56

This PCIe Gen4 Ethernet x16 adapter provides two 100 GbE QFSP56 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 QFSP56 cables. Alternatively to the above supported cables, you may choose to order an IBM qualified and supported

QFSP56 optical transceiver (feature #EB59) to put into the adapter ports and MTP/MPO cable 10M or 30M in length (feature #EB2J or #EB2K) optical cabling to use with your own QFSP56 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 to put into the adapter ports and MTP/MPO cable 30M in length (feature #EB2K) optical cabling to use with your own QFSP56 optical transceiver for the other end.

Either one or both of the adapter's two QFSP56 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 #EC76 and #EC75 have identical electronics and function and CCIN (2CFB), but have different tail stock brackets. #EC76 is high profile and #EC75 is low profile. The adapter is based on a Mellanox ConnectX-6 adapter which uses a ConnectX-6 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
- PowerVM SR-IOV support

For SR-IOV FAQs visit <https://community.ibm.com/community/user/power/viewdocument/sr-iov-vnic-and-hnv-information?CommunityKey=71e6bb8a-5b34-44da-be8b-277834a183b0&tab=librarydocuments>

- Attributes provided: 2-port 100Gb Ethernet
- Attributes required: Full-high x16 PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-01-2246, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-05-2246, or later
 - AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-03-2246, or later (planned availability date March 17, 2023)
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later, with Mellanox OFED 5.7, or later
 - Red Hat Enterprise Linux 8.6, for POWER LE, or later, with Mellanox OFED 5.7, or later

- Red Hat OpenShift Container Platform, 4.11, or later
- IBM i supported

Notes:

- IBM i supports dedicated driver for the NIC function.
- IBM i supports native SR-IOV for the NIC function.
- IBM i 7.4 or later also adds support for dedicated RoCE and native SR-IOV RoCE, which is used only by IBM Db2 Mirror for i.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).
 - Assignment to the VIOS requires VIOS 3.1.4.10, or later

(#EC78) - PCIe4 2-port 100Gb Crypto Connectx-6 DX QFSP56

This Gen4 x16 adapter provides up to two ports of 100 Gb/s Ethernet connectivity. The adapter supports both the network interface card (NIC) standard and the InfiniBand trade association (IBTA) standard for remote direct memory access (RDMA) over converged Ethernet (RoCE). 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.

Feature EC77 and feature EC78 are sourced from the Mellanox Corporation and are based on the Mellanox ConnectX-6 Dx technology. They have identical electronics and function and the same CCIN of 2CFA, but they have different tailstocks. Feature EC77 is low profile and feature EC78 is full height.

Limitation:

- The adapter is supported only by IBM i and runs in dedicated mode only (no PowerVM virtualization) and RoCE and IP Security (IPSEC). (RoCE and IPSEC are only supported by IBM i Db2 Mirror).
- Single root I/O virtualization (SR-IOV) is not supported.

Details for the ports include:

- PCI Express Gen4 x16
- IPSEC over RoCE
- RoCE over overlay networks
- NIC supported
- Attributes provided: Two-port 100Gb/s Ethernet adapter
- Attributes required: One full-height PCIe slot Gen4 x16
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported

- Linux not supported

NOTES:

- IBM i 7.4 or later supports dedicated driver for the NIC, RoCE, and IPSEC functions (RoCE and IPSEC are supported only by IBM i Db2 Mirror).
 - IBM i 7.3 supports dedicated driver for the NIC function.
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

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

(No Longer Available as of May 12, 2023)

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.

- i Note:** NVMe Flash adapters #EC7A or #EC7B can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ.
 - Assignment to the VIOS supported

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

(No Longer Available as of May 12, 2023)

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.

- i Note:** NVMe Flash adapters #EC7C or #EC7D can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ.
 - Assignment to the VIOS supported

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

(No Longer Available as of May 12, 2023)

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.

- i Note:** NVMe Flash adapters #EC7E or #EC7F can be used to meet minimum AIX/ Linux SSD/HDD and backplane requirements.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).
 - Assignment to the VIOS supported

(#EC7K) - PCIe4 1.6TB NVMe Flash Adapter x8 for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC7J and EC7K are the same adapter with different feature codes. Feature EC7J is low-profile adapter and feature EC7K is full-height adapters. Features EC7J and EC7K are supported by IBM i. CCIN is 594A.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC7M) - PCIe4 3.2TB NVMe Flash Adapter x8 for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC7L and EC7M are the same adapter with different feature codes. Feature EC7L is low-profile adapter and feature EC7M is full-height adapters. Features EC7L and EC7M are supported by IBM i. CCIN is 594B.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC7P) - PCIe4 6.4TB NVMe Flash Adapter x8 for IBM i

(No Longer Available as of May 12, 2023)

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).

Features EC7N and EC7P are the same adapter with different feature codes. Feature EC7N is low-profile adapter and feature EC7P is full-height adapters. Features EC7N and EC7P are supported by IBM i. CCIN is 594C.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is 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.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: NVMe Flash Adapter
- Attributes required: one slot available
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (ordering one of these CEC cover set features: #EJUY, #EJUZ, #EJVY, #EJVZ).

(#EC7T) - 800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux

Mainstream 800 GB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm Non-Volatile Memory Express (NVMe) PCIe Gen4 x 4 interface in the system. NVMe is a high performance

architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Feature #EC7T has the CCIN number of 59B7 and indicates usage by AIX, Linux, or VIOS in which the SSD is formatted in 4096 byte sectors.

Mainstream 800 GB solid state drive (SSD) formatted in 4096 byte sectors (4K). This Mainstream solid-state drive is rated at 2.4 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

- Attributes provided: 800 GB low latency flash memory
- Attributes required: PCIe Gen4 slot in system unit
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i not supported
 - IBM i does not support this feature through VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ECBJ) - SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure

(No longer available as of January 12, 2024)

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

(No Longer Available as of August 11, 2023)

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

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

(No longer available as of January 12, 2024)

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

(No longer available as of January 12, 2024)

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

(No longer available as of January 12, 2024)

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

(No Longer Available as of August 11, 2023)

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

(#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 #EJ2B, #EJ2C, #EJ0X, #EJ10 or #EJ11. 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 #EJ2B, #EJ2C, #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

(No longer available as of January 12, 2024)

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

(#ECCF) - System Port Converter Cable for UPS

Converter cable allows a serial cable attached to a Uninterruptible Power Supply (UPS) to connect to a USB port on the server's service processor card. Cable's connectors are USB (Male) and 9 PIN D SHELL (Female) and the cable's length is about 1.6m (60 inches). The UPS can provide power status information over the cable to IBM i.

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

(#ECCS) - 3M Copper CXP Cable Pair for PCIe3 Expansion Drawer

(No Longer Available as of January 12, 2024)

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: 9999 (Initial order maximum: 250)
- 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

(No Longer Available as of January 12, 2024)

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 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

(#ECCY) - 10M Active Optical Cable Pair for PCIe3 Expansion Drawer

(No Longer Available as of January 12, 2024)

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)

(No longer available as of January 12, 2024)

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)

(No longer available as of January 12, 2024)

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.

i Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

<https://www14.software.ibm.com/webapp/set2/iprt/home>

- 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)

(No longer available as of January 12, 2024)

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.

i Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

<https://www14.software.ibm.com/webapp/set2/iprt/home>

- 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)

(No longer available as of January 12, 2024)

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)

(No longer available as of January 12, 2024)

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)

(No longer available as of January 12, 2024)

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.

i Note: AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

<https://www14.software.ibm.com/webapp/set2/iprt/home>

- 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)

(No longer available as of January 12, 2024)

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.

- i Note:** AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

<https://www14.software.ibm.com/webapp/set2/iprt/home>

- 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

(#ECEO) - 0.6M SAS AA12 Cable (Adapter to Adapter)

(No longer available as of January 12, 2024)

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 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.

The 6Gb version of this cable is feature #5918. #5918 and #ECEO 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)

(No longer available as of January 12, 2024)

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.

- i** **Note:** AOC cables require minimum level of SAS Adapter firmware. Refer to the latest prerequisites at

<https://www14.software.ibm.com/webapp/set2/iprt/home>

- 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

(#ECJ6) - 4.3m (14-Ft) PDU to Wall 3PH/40A 200-240V Power Cord

This power cord goes from the chassis to a wall-type outlet. The line cord has a 200-240V, CS8365 50A Plug (de-rated to 40A) and Amphenol inlet compatible with PDU FCs ECJL and ECJQ. The following countries/regions use the #ECJ6 power cord to power the system: United States and Canada only.

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

(#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.

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, #6667, #ELC1 or #ELC2.

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 7965-S42 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 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 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, #ECJ6, 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 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 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.

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, #6667, #ELC1 or #ELC2.

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, #ECJ6, 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 7965-S42 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 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 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

(#ECLS) - 3.0M CXP x16 Copper Cable Pair for PCIe4 Expansion Drawer

This 3.0 meter cable pair connects a PCIe4 fan-out module in the PCIe Gen4 I/O Expansion Drawer to a PCIe4 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 PCIe4 fan-out module and to the top CXP port of the PCIe4 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 features ECLR (2M optical), ECLX (3M optical), ECLY (10M optical), ECLZ (20M optical) cable, but are more costly.

Limitation: Cannot mix copper and optical cables on the same PCIe Gen4 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 PCIe4 Optical Cable Adapter (#EJ24 or #EJ2A) and on a PCIe4 module such as a ESM1 in a PCIe Gen4 Expansion Drawer (feature ESR0)
- 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

(#ECLX) - 3.0M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer

The 3.0 meter active optical cable (AOC) x16 pair connects a PCIe4 module in the PCIe Gen4 I/O Expansion Drawer to a PCIe4 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 PCIe4 module and to the top CXP port of the PCIe4 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 PCIe4 Optical Cable Adapter and on a PCIe4 module in a PCIe Gen4 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

(#ECLY) - 10M Active Optical Cable x16 Pair for PCIe4 Expansion Drawer

The 10 meter active optical cable (AOC) x16 pair connects a PCIe4 module in the PCIe Gen4 I/O Expansion Drawer to a PCIe4 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 PCIe4 module and to the top CXP port of the PCIe4 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 PCIe4 Optical Cable Adapter and on a PCIe4 module in a PCIe Gen4 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

(#ECSM) - Custom Service Specify, Mexico

Having #ECSM on the order, will cause the order to be routed to Mexico and the machine to be internally routed to the CSC build area.

- Attributes provided: Customization
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)

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

(#ECSP) - Custom Service Specify, Poughkeepsie, USA

Having #ECSP on the order, will cause the order to be routed to Poughkeepsie, USA and the machine to be internally routed to the CSC build area.

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

(#ECT9) - 15.3 TB Mainstream NVMe U.2 SSD 4k for AIX/Linux

Mainstream 15.36 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm Non-Volatile Memory Express (NVMe) PCIe Gen4 x 4 interface in the system. NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Feature #ECT9 has the CCIN number of 5941 and indicates usage by AIX, Linux, or VIOS in which the SSD is formatted in 4096 byte sectors.

Mainstream 15.36 solid state drive (SSD) formatted in 4096 byte sectors (4K). This Mainstream solid-state drive is rated at 1 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

- Attributes provided: 15.36 TB low latency flash memory
- Attributes required: PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - AIX supported
 - IBM i requires VIOS
 - Red Hat Enterprise Linux 8.10, or later
 - Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - Red Hat OpenShift Container Platform 4.13, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ECTB) - 15.3 TB Mainstream NVMe U.2 SSD 4k for IBM i

Mainstream 15.36 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm Non-Volatile Memory Express (NVMe) PCIe Gen4 x 4 interface in the system. NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Feature #ECTB has the CCIN number of 5941 and indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

Mainstream 15.36 solid state drive (SSD) formatted in 4160 byte sectors (4K). This Mainstream solid-state drive is rated at 1 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

- Attributes provided: 15.36 TB low latency flash memory
- Attributes required: PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5 TR4, or later
 - IBM i 7.4 TR10, or later
 - AIX not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#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

(#EFCQ) - I/O shipping consolidation

This specify feature indicates to the IBM Marketing configurator tools and IBM manufacturing to drive the consolidation of multiple Drawers on one shipping container.

Note: EFCQ is mandatory with the following selections:

- Rack Indicator- Not Factory Integrated (feature 4650) selected.

- Expansion Drawers (feature ENZ0 or EMX0 plus feature ESLS or ESR0 equals to quantity two or less).
- Expansion Drawers (feature ENZ0 or EMX0 plus feature ESLS or ESR0 equals to quantity one or more).
- No Cover and Doors or Front Bezels (feature #EJUx) selected.
- No Customer Specified Placement (feature 0456) selected.
- Attributes provided: Manufacturing Routing Code
- 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

(#EHKV) - SAP HANA TRACKING FEATURE

(No Longer Available as of September 13, 2022)

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

(#EHR2) - Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)

(No Longer Available as of October 20, 2023)

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: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EHS2) - SSD Placement Indicator - #ESLS/#ELLS

(No Longer Available as of October 20, 2023)

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

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

(#EHSB) - IBM i HW/SW Bundle Solution Indicator

Having EHSB on the order will cause the order to be routed to Project Office rep for PWaaS integrated processes.

i Note: EHSB is password protected for initial orders. Please contact daniel.goldener@ibm.com for additional information.

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

(#EHSC) - Power Modernization Segment Indicator

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

(#EHSD) - Power AIX Segment Indicator

- Attributes provided: None

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

(#EHSE) - Power IBM i Segment Indicator

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

(#EJ0J) - PCIe3 RAID SAS Adapter Quad-port 6Gb x8

(No longer available as of January 12, 2024)

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 Power9/Power10 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: 8 (Initial order maximum: 8)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).
 - Assignment to the VIOS supported

(#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 cannot be mixed in the same array.

Limitations:

- HDD and SSD cannot be mixed on the same SAS port, but can be mixed on the same adapter.
- #5886 3.5-inch SAS I/O Drawer is not supported.
- 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: 8 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).
 - Assignment to the VIOS supported

(#EJ10) - PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8

(No longer available as of January 12, 2024)

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.

i Note: The original #EJ0X adapter does not support DVD but also has the same CCIN.

i Note: Adapter uses a Mini-SAS HD narrow connector and AE1 #ECBZ or YE1 #ECBY SAS cable.

Limitation: LTO-4 or earlier drives are not supported.

- Attributes provided: full high PCIe3 four port x8 SAS adapter
- Attributes required: One PCIe slot per adapter
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).
 - Assignment to the VIOS supported

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

(No longer available as of January 12, 2024)

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: 8 (Initial order maximum: 8)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).
 - Assignment to the VIOS supported

(#EJ1Y) - Storage Backplane with eight NVMe U.2 drive slots

- Attributes provided: Storage backplane
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EJ2A) - PCIe4 x16 to CXP Converter Adapter (support AOC)

PCIe3 x16 adapter provides two optical CXP ports for the attachment of two active optical cables (AOC). One adapter supports the attachment of one PCIe3 module in a PCIe Gen3 I/O Expansion Drawer.

- Attributes provided: PCIe3 adapter with two CXP ports to attach two active optical cables
- Attributes required: PCIe3 x16 slot in system unit plus a pair of active optical cables (one optical pair feature such as #ECCS, #ECCX, or #ECCY)
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - AIX supported
 - Linux supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EJ2B) - PCIe3 12Gb x8 SAS Tape HBA Adapter

The PCIe3 SAS Tape HBA Adapter is a high performance SAS tape controller using PCIe Gen3 12Gb x8 technology. The adapter supports external SAS tape drives such as the LTO-6, LTO-7, LTO-8, and LTO-9, available in the IBM 7226-1U3 Multimedia drawers or standalone tape units such as the TS2270, TS2280 single External Tape Drive, TS2900, TS3100, TS3200, or TS4300. The adapter provides four Mini-SAS HD (high density) connectors to which AE1 SAS cables such as #ECBY or AA12 SAS cables such as #ECE3 with HD narrow connectors, other cables supplied with tape devices may also be supported. A max of 4 tape drives per adapter can be attached using four AE1 or AA12 cables.

#EJ2B (full high) and #EJ2C (low profile) are electronically the same adapter with the same 57F2 CCIN, but differ in that their tailstocks to fit different size PCIe slots.



Note: Adapter uses a Mini-SAS HD narrow connector and AE1 such as #ECBY or AA12 SAS cables such as #ECE3 or 4m Mini-SAS HD/Mini-SAS 1X Cable such as Storage feature #5507.

Prerequisite: Firmware 1030.20.

Limitations:

- For a 12Gb SAS connection, cables longer than 3 meters are not supported.
- LTO-5 or earlier drives are not supported.
- LTO-6 devices support reading LTO-5 tapes for restore purposes.
- VIOS not supported.
- Attributes provided: Full high PCIe3 four port x8 SAS adapter

- Attributes required: One PCIe slot per adapter
- Minimum required: 0
- Maximum allowed: 7 (Initial order maximum: 7)
- OS level required:
 - IBM i 7.5 TR2, or later
 - IBM i 7.4 TR8, or later
 - AIX not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- 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 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

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: 4 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - IBM i supported

- Linux supported

Linux software support can be downloaded from the following location:

- <http://www-03.ibm.com/security/cryptocards/pciecc2/ordersoftware.shtml>

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



Note: This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).

(#EJ33) - PCIe3 Crypto Coprocessor BSC-Gen3 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 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

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: 6 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - IBM i supported

- Linux supported

Linux software support can be downloaded from the following location:

- <http://www-03.ibm.com/security/cryptocards/pciecc2/ordersoftware.shtml>
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).

(#EJ35) - PCIe3 Crypto Coprocessor no BSC 4769

The 4769 PCIe Cryptographic Coprocessor has a PCIe local-bus- compatible interface. The coprocessor holds a security-enabled subsystem module and batteries for backup power. The hardened encapsulated subsystem contains two sets of two 32-bit PowerPC 476FP reduced instruction set computer (RISC) processors running in lockstep with cross-checking to detect soft errors in the hardware. It also contains a separate service processor used to manage self-test and firmware updates; RAM; flash memory and battery-powered memory; secure time-of-day; cryptographic quality random number generator; AES; DES; Triple DES; HMAC; CMAC; MD5; multiple SHA hashing methods; modular- exponentiation hardware, such as RSA and ECC; and full-duplex direct memory access (DMA) communications.

A security-enabled code-loading arrangement allows control program and application program loading and refreshes after coprocessor installation in your server. IBM offers an embedded subsystem control program and a cryptographic application programming interface (API) that implements the IBM CCA.

The IBM Common Cryptographic Architecture Support Program can be accessed from the internet at no charge to the user. See the IBM CCA Basic Services Reference and Guide, which can be found at the IBM Cryptocards Library for a full explanation of the CCA API <https://www.ibm.com/security/cryptocards/pciecc4/library>.

For details on future updates to the versions of operating systems that are supported by the 4769 PCIe Cryptographic Coprocessor, see the IBM Cryptocards website <https://www.ibm.com/security/cryptocards>.

Feature #EJ35 and #EJ37 are both feature codes representing the same physical card with the same CCIN of COAF. Different feature codes are used to indicate if a blind swap cassette is used and its type. #EJ35 indicates no blind swap cassette. #EJ37 indicates a Gen 3 blind swap cassette.

The 4769 PCIe Cryptographic Coprocessor is designed to deliver the following functions:

- X.509 certificate services support
- ANSI X9 TR34-2019 key exchange services that exploit the public key infrastructure (PKI)
- ECDSA secp256k1
- CRYSTALS-Dilithium, a quantum-safe algorithm for digital signature generation and verification

- Rivest-Shamir-Adleman (RSA) algorithm for digital signature generation and verification with keys up to 4096 bits in length
- High-throughput Secure Hash Algorithm (SHA), MD5 message digest algorithm, Hash-Based Message Authentication Code (HMAC), Cipher-based Message Authentication Code (CMAC), Data Encryption Standard (DES), Triple Data Encryption Standard (Triple DES), and Advanced Encryption Standard (AES)-based encryption for data integrity assurance and confidentiality, including AES Key Wrap (AESKW) that conforms to ANSI X9.102
- Elliptic-curve cryptography (ECC) for digital signature and key agreement
- Support for smart card applications and personal identification number (PIN) processing
- Secure time-of-day
- Visa Data Secure Platform (DSP) point-to-point encryption (P2PE) with standard Visa format-preserving encryption (FPE) and format-preserving, Feistel-based Format Preserving Encryption (FF1, FF2, FF2.1). Format Preserving Counter Mode (FPCM) as defined in x9.24 Part 2
- 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: 4 (Initial order maximum: 4)
- OS level required:
 - AIX supported
 - IBM i supported
 - Linux supported

Linux software support can be downloaded from the following location:

- <http://www-03.ibm.com/security/cryptocards/pciecc2/ordersoftware.shtml>
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).

(#EJ37) - PCIe3 Crypto Coprocessor BSC-Gen3 4769

The 4769 PCIe Cryptographic Coprocessor has a PCIe local-bus-compatible interface. The coprocessor holds a security-enabled subsystem module and batteries for backup power. The hardened encapsulated subsystem contains two sets of two 32-bit PowerPC 476FP reduced instruction set computer (RISC) processors running in lockstep with cross-checking to detect soft errors in the hardware. It also contains a separate service processor used to manage self-test and firmware updates; RAM; flash memory and battery-powered memory; secure time-of-day; cryptographic quality random number generator; AES; DES; Triple DES; HMAC; CMAC; MD5; multiple SHA hashing methods; modular-exponentiation hardware, such as RSA and ECC; and full-duplex direct memory access (DMA) communications.

A security-enabled code-loading arrangement allows control program and application program loading and refreshes after coprocessor installation in your server. IBM offers an embedded

subsystem control program and a cryptographic application programming interface (API) that implements the IBM CCA.

The IBM Common Cryptographic Architecture Support Program can be accessed from the internet at no charge to the user. See the IBM CCA Basic Services Reference and Guide, which can be found at the IBM Cryptocards Library for a full explanation of the CCA API.

For details on future updates to the versions of operating systems that are supported by the 4769 PCIe Cryptographic Coprocessor, see the IBM Cryptocards website
<https://www.ibm.com/security/cryptocards>.

Feature #EJ35 and #EJ37 are both feature codes representing the same physical card with the same CCIN of COAF. Different feature codes are used to indicate if a blind swap cassette is used and its type. #EJ35 indicates no blind swap cassette. #EJ37 indicates a Gen 3 blind swap cassette.

The 4769 PCIe Cryptographic Coprocessor is designed to deliver the following functions:

- X.509 certificate services support
- ANSI X9 TR34-2019 key exchange services that exploit the public key infrastructure (PKI)
- ECDSA secp256k1
- CRYSTALS-Dilithium, a quantum-safe algorithm for digital signature generation and verification
- Rivest-Shamir-Adleman (RSA) algorithm for digital signature generation and verification with keys up to 4096 bits in length
- High-throughput Secure Hash Algorithm (SHA), MD5 message digest algorithm, Hash-Based Message Authentication Code (HMAC), Cipher-based Message Authentication Code (CMAC), Data Encryption Standard (DES), Triple Data Encryption Standard (Triple DES), and Advanced Encryption Standard (AES)-based encryption for data integrity assurance and confidentiality, including AES Key Wrap (AESKW) that conforms to ANSI X9.102
- Elliptic-curve cryptography (ECC) for digital signature and key agreement
- Support for smart card applications and personal identification number (PIN) processing
- Secure time-of-day
- Visa Data Secure Platform (DSP) point-to-point encryption (P2PE) with standard Visa format-preserving encryption (FPE) and format-preserving, Feistel-based Format Preserving Encryption (FF1, FF2, FF2.1). Format Preserving Counter Mode (FPCM) as defined in x9.24 Part 2
- 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: 6 (Initial order maximum: 6)
- OS level required:
 - AIX supported
 - IBM i supported
 - Linux supported

Linux software support can be downloaded from the following location:

- <http://www-03.ibm.com/security/cryptocards/pciecc2/ordersoftware.shtml>
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).

(#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 specifies indicates the pairing will not be on just one server.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: Only one #EJ14 on a server and its pair on a different server.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
 - IBM i not supported
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJRU) - Non-paired Indicator EJ0L PCIe SAS RAID Adapter

(No Longer Available as of November 08, 2022)

Feature EJRU must be added for every instance of a non-paired SAS RAID adapter #EJ0L. It identifies a specific high availability configuration supported by AIX or Linux which has one #EJ0L on one system and the paired #EJ0L located on a second system. IBM i does not support paired adapter on different servers.

- Attributes provided: SAS RAID adapter firmware disables write cache until a second SAS RAID adapter is recognized.
- Attributes required: Every #EJ0L requires a 6Gb/s SAS RAID adapter (#EJ0L) on both this server and on another server that will pair up the SAS RAID adapter and enable the onboard caches to function.
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 0)
- OS level required:
 - IBM i not supported
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: MES
- CSU: Yes

- Return parts MES: No

(#EJUV) - Front OEM Bezel for 16 NVMe-bays Backplane Rack-Mount

Front bezel with OEM logo plus rails for 4U rack mounted system. Bezel fits Storage Backplane and its 16 NVMe bays. Rails adjust from approximately 24 to 31 inches in depth.

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

(#EJUX) - Front OEM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount

Front bezel with OEM logo plus rails for 4U rack mounted system. Bezel fits Storage Backplane and its 16 NVMe bays plus optional RDX. Rails adjust from approximately 24 to 31 inches in depth.

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

(#EJUY) - IBM Cover and Doors for 16 NVMe-bays Backplane Desk-side

Cover and doors with IBM logo for 4U Tower system. Bezel fits Storage Backplane and its 16 NVMe bays.

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

(#EJUZ) - OEM Cover and Doors for 16 NVMe-bays Backplane Desk-side

Cover and doors with OEM logo for 4U Tower system. Bezel fits Storage Backplane and its 16 NVMe bays.

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

(#EJVY) - IBM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side

Cover and doors plus RDX with IBM logo for 4U Tower system. Bezel fits Storage Backplane and its 16 NVMe bays.

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

(#EJVZ) - OEM Cover and Doors for 16 NVMe-bays and RDX Backplane Desk-side

Cover and doors plus RDX with OEM logo for 4U Tower system. Bezel fits Storage Backplane and its 16 NVMe bays.

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

(#EJW0) - Specify Mode-1 & CEC SAS Ports & (2)Y012 for EXP24SX #ESLS/ELS

(No Longer Available as of October 20, 2023)

Feature indicates that EXP24SX SAS Storage Enclosure (#ESLS or #ELLS) will be configured by IBM Manufacturing in Mode 1 (one group of 24 drive bays). It will be connected to the two SAS ports on the rear of the system unit run by the integrated SAS controllers of the high performance/function storage backplane.

Two YO12 cables connect the SAS Storage Enclosure to the systems SAS ports. Use the cable length appropriate to the configuration and select from features such as #ECDT, #ECDU, #ECDV or #ECDW.

One specify feature should ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This specify feature indicates a full set of adapters plus SAS cables is used for the enclosure.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, Integrated SAS controllers and SAS cables as indicated in description
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW1) - Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)

- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW2) - Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 Y012 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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW3) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW4) - Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW5) - Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ELLS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW6) - Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJW7) - Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

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

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

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

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWC) - Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 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 #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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWD) - Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWE) - Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWF) - Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 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 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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature EJ14 or ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWG) - Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature EJ14 or ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWH) - Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 be ordered with each SAS Storage Enclosure. This feature does not order or ship any hardware, but indicates to IBM config tools and to IBM Manufacturing the combination of enclosure mode, SAS adapter and SAS cable type which will be used.

This indicates a "partial" configuration where there are not enough adapters/cables to run all the SAS bays in the SAS Storage Enclosure. If adapters/cables are MES added later to support the rest of the SAS bays, then this specify code should be removed and the appropriate specify feature added to help IBM config tools understand the expanded usage, probably specify feature #EJWG.

- Attributes provided: Communicate configuration information to IBM Manufacturing
- Attributes required: SAS Storage Enclosure, PCIe3 RAID SAS adapter(s) and SAS cable(s) as indicated in description
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 0)

- OS level required: Refer to feature EJ14 or ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJWJ) - Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS

(No Longer Available as of October 20, 2023)

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 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: 28 (Initial order maximum: 0)
- OS level required: Refer to feature EJ14 or ESLS or ESLL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EJXU) - Front IBM Bezel for 16 NVMe-bays Backplane Rack-Mount

Front bezel with IBM logo plus rails for 4U rack mounted system. Bezel fits Storage Backplane and its 16 NVMe bays. Rails adjust from approximately 24 to 31 inches in depth.

- Attributes provided: Front IBM Bezel
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: No

- Return parts MES: No

(#EJXW) - Front IBM Bezel for 16 NVMe-bays and RDX Backplane Rack-Mount

Front bezel with IBM logo plus rails for 4U rack mounted system. Bezel fits Storage Backplane and its 16 NVMe bays plus optional RDX. Rails adjust from approximately 24 to 31 inches in depth.

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

(#EKF2) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 800 GB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF2 has CCIN number of 5B53 and indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 800 GB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
 - AIX not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKF3) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF3 and #EKF4 are physically identical drives with the same CCIN of 5B52. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF3 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF4 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator.

Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot

- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, for Power LE, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EKF4) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF3 and #EKF4 are physically identical drives with the same CCIN of 5B52. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF3 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF4 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator.

Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
 - AIX not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKF5) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF5 and #EKF6 are physically identical drives with the same CCIN of 5B51. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF5 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF6 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator.

Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, for Power LE, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EKF6) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF5 and #EKF6 are physically identical drives with the same CCIN of 5B51. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF5 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF6 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator.

Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be

replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
 - AIX not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKF7) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF7 and #EKF8 are physically identical drives with the same CCIN of 5B50. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF7 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF8 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator.

Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, for Power LE, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EKF8) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) device. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #EKF7 and #EKF8 are physically identical drives with the same CCIN of 5B50. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature EKF7 indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature EKF8 indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the

standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
 - AIX not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKF9) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 800 GB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - Red Hat Enterprise Linux 8.6, for Power LE, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - Assignment to the VIOS supported
 - Not supported in NED24 NVMe Expansion Drawer

(#EKLW) - EKF2 Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)

(No Longer Available as of October 24, 2023)

This specify code indicates that a #EKF2 Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature EKF2
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature EKF2
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKLX) - EKF4 Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

(No Longer Available as of October 24, 2023)

This specify code indicates that a #EKF4 Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature EKF4
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)

- OS level required: See feature EKLX
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKLY) - EKF6 Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

(No Longer Available as of October 24, 2023)

This specify code indicates that a #EKF6 Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature EKF6
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature EKF6
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EKLZ) - EKF8 Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

(No Longer Available as of October 24, 2023)

This specify code indicates that a #EKF8 Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature EKF8
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature EKF8
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EL1P) - 300GB 15k RPM SAS SFF-2 Disk Drive (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 #EL1S EXP24S or #ELLS 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EL1Q) - 600GB 10k RPM SAS SFF-2 Disk Drive (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 #EL1S EXP24S or #ELLS 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EL9D) - ESMD Load Source Specify (931GB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESMD Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESMD
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESMD
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EL9H) - ESMH Load Source Specify (1.86TB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESMH Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESMH
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESMH
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EL9S) - ESMS Load Source Specify (3.72TB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESMS Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESMS
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESMS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EL9X) - ESMX Load Source Specify (7.44TB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESMX Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESMX
- Minimum required: 0

- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESMX
- 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#ECJJ, #ECJN, #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. #ELC0 is not supported on ECJL, ECJQ, EPTL or EPTQ PDUs.

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-S42.

- 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

(#ELC1) - 4.3m (14-Ft) PDU to Wall 24A 200-240V Power Cord North America

This power cord goes from the chassis to a wall-type outlet. The line cord has a 200-240V, IEC309 30A P+N+G Plug (de-rated to 24A) and Souriau inlet compatible with PDU FCs ECJJ and ECJN. The following countries/regions use the #ELC1 power cord to power the system: United States, Canada, Mexico.

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

(#ELC2) - 4.3m (14-Ft) PDU to Wall 3PH/24A 415V Power Cord North America

This power cord goes from the chassis to a wall-type outlet. The line cord has a 3-phase wye-wired 415/240V, IEC309 30A 3P+N+G Plug (de-rated to 24A per phase) and Souriau inlet compatible with

PDU FCs ECJJ and ECJN. The following countries/regions use the #ELC2 power cord to power the system: United States, Canada, Mexico.

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

(#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

(#ELEV) - 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: - Can not 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

- Attributes provided: 571GB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 0)
- OS level required:

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

i **Note:** Assignment to the VIOS supported

(#ELF3) - 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

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 Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, a 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i **Note:** Assignment to the VIOS supported

(#ELFT) - 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

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 Linux applications access SAS drives through a file system and experience no effect of this sector size transition. In much less common cases, an 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: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ELKM) - ESKM Load Source Specify (931GB SSD SFF-2)

This specify code indicates that a #ESKM Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKM
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKM
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELKR) - ESKR Load Source Specify (1.86TB SSD SFF-2)

This specify code indicates that a #ESKR Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKR
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKR
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELKV) - ESKV Load Source Specify (3.72TB SSD SFF-2)

This specify code indicates that a #ESKV Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKV
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKV
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELKZ) - ESKZ Load Source Specify (7.44TB SSD SFF-2)

This specify code indicates that a #ESKZ Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKZ
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKZ
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELS3) - ES1F Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES1F Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES1F
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES1F
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#ELSG) - ES1K Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES1K Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES1K
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES1K
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELSQ) - ES1H Load Source Specify (3.2 TB 4K NVMe U.2 SSD for IBM i)

This specify code indicates that a #ES1H Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES1H
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES1H
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELT2) - #ESF2 Load Source Specify (1.1TB HDD SFF-2)

This specify code indicates that a #ESF2 disk drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: #ESF2
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ESF2
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELTS) - #ESFS Load Source Specify (1.7TB HDD SFF-2)

This specify code indicates that a #ESF5 disk drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: #ESFS
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ESFS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELTU) - #ESEU Load Source Specify (571GB HDD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESEU disk drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: #ESEU
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ESEU
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELU9) - ESK9 Load Source Specify (387GB SSD SFF-2)

This specify code indicates that a #ESK9 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESK9
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESK9
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELUD) - ESKD Load Source Specify (775GB SSD SFF-2)

This specify code indicates that a #ESKD Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKD
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKD
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#ELUH) - ESKH Load Source Specify (1.55TB SSD SFF-2)

This specify code indicates that a #ESKH Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESKH
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ESKH
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELUK) - ESJK Load Source Specify (931GB SSD SFF-2)

This specify code indicates that a #ESJK Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJK
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJK
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ELUL) - #ESNL Load Source Specify (283GB HDD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESNL Hard Disk Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature #ESNL
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ESNL
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELUM) - ESJM Load Source Specify (1.86TB SSD SFF-2)

This specify code indicates that a #ESJM Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing

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

(#ELUP) - ESJP Load Source Specify (3.72TB SSD SFF-2)

This specify code indicates that a #ESJP Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJP
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJP
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ELUQ) - #ESNQ Load Source Specify (571GB HDD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ESNQ Hard Disk Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature #ESNQ
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ESNQ
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELUR) - ESJR Load Source Specify (7.44TB SSD SFF-2)

This specify code indicates that a #ESJR Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJR
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ESJR
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes

- Return parts MES: No

(#ELUW) - EC5W Load Source Specify (6.4 TB 4K NVMe U.2 SSD for IBM i)

This specify code indicates that a #EC5W Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature EC5W
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature EC5W
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELV9) - ETK9 Load Source Specify (387 GB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ETK9 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ETK9
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ETK9
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELVD) - ETKD Load Source Specify (775 GB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ETKD Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ETKD
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ETKD
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELVH) - ETKH Load Source Specify (1.55 TB SSD SFF-2)

(No longer available as of January 12, 2024)

This specify code indicates that a #ETKH Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ETKH
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ETKH
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELVK) - EC7K Load Source Specify (1.6TB SSD NVMe adapter for IBM i)

(No Longer Available as of August 11, 2023)

Specify code indicates a #EC7K solid state drive (SSD) NVMe adapter is used as the Load Source.

The IBM i NVMe Load Source Namespace size specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature #EC7K
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature EC7K
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELVM) - EC7M Load Source Specify (3.2TB SSD NVMe adapter for IBM i)

(No Longer Available as of August 11, 2023)

Specify code indicates a #EC7M solid state drive (SSD) NVMe adapter is used as the Load Source.

The IBM i NVMe Load Source Namespace size specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature #EC7M
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature EC7M
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#ELVP) - EC7P Load Source Specify (6.4TB SSD NVMe adapter for IBM i)

(No Longer Available as of August 11, 2023)

Specify code indicates a #EC7P solid state drive (SSD) NVMe adapter is used as the Load Source.

The IBM i NVMe Load Source Namespace size specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature #EC7P
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature EC7P
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYA) - ES3A Load Source Specify (800 GB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES3A Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES3A
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ES3A
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYC) - ES3C Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES3C Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES3C
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ES3C
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#ELYD) - ES4C Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES4C Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES4C
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES4C
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYE) - ES3E Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES3E Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES3E
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ES3E
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYF) - ES4E Load Source Specify (3.2 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES4E Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES4E
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES4E
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYG) - ES3G Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES3G Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES3G
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: see feature ES3G
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELYH) - ES4G Load Source Specify (6.4 TB 4K NVMe U.2 SSD PCIe4 for IBM i)

This specify code indicates that a #ES4G Solid State Drive is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENSA and #ENSB are used with this specify code.

- Attributes provided: Load source specify
- Attributes required: Feature ES4G
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: See feature ES4G
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ELZ5) - ES95 Load Source Specify (387GB SSD SFF-2)

This specify code indicates that a #ES95 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ES95
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ES95
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ELZB) - ESNB Load Source Specify (775GB SSD SFF-2)

This specify code indicates that a #ESNB Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESNB
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)

- OS level required: see feature ESNB
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ELZF) - ESNF Load Source Specify (1.55TB SSD SFF-2)

This specify code indicates that a #ESNF Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESNF
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ESNF
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EM6N) - 32GB (2x16GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory

This feature ships two 16 GB DDIMMs providing 32 GB of DDR4 memory. DRAM is 8Gb and 3200 MHz.

- Attributes provided: Two 16 GB DDIMMs providing 32 GB of DDR4 memory
- Attributes required: Two empty DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EM6W) - 64GB (2x32GB) DDIMMs, 3200 MHz, 8GBIT DDR4 Memory

This feature ships two 32 GB DDIMMs providing 64 GB of DDR4 memory. DRAM is 8Gb and 3200 MHz.

- Attributes provided: Two 32 GB DDIMMs providing 64 GB of DDR4 memory
- Attributes required: Two empty DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EM6X) - 128GB (2x64GB) DDIMMs, 3200 MHz, 16GBIT DDR4 Memory

This feature ships two 64 GB DDIMMs providing 128 GB of DDR4 memory. DRAM is 16Gb and 3200 MHz.

- Attributes provided: Two 64 GB DDIMMs providing 128 GB of DDR4 memory
- Attributes required: Two empty DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EM6Y) - 256GB (2x128GB) DDIMMs, 2666 MHz, 16GBIT DDR4 Memory

This feature ships two 128 GB DDIMMs providing 256 GB of DDR4 memory. DRAM is 16Gb and 2666 MHz.

- Attributes provided: Two 128 GB DDIMMs providing 256 GB of DDR4 memory
- Attributes required: Two empty DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required:
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EMBP) - Active Memory Expansion

AME 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 or 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.

AME uses CPU resource to compress or 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 or decompression.

Power10 chips include a hardware accelerator designed to boost AME efficiency and use less Power core resource. The Power10 accelerator includes some minor enhancements and also leverages Power10 higher bandwidth and lower latency characteristics.

You have a great deal of control over AME usage. Each individual AIX partition can turn on or turn off AME. Control parameters set the amount of expansion desired in each partition to help control the

amount of CPU used by the AME 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 Power model can run the planning tool. In addition, a one-time, 60-day trial of AME is available to enable more exact memory expansion and CPU measurements. You can request the trial using the Power Capacity on Demand website.

AME is enabled by chargeable hardware feature (#EMBP), 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 AME. Normal licensing requirements apply.

- Attributes provided: None
- Attributes required: An HMC
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - AIX supported
 - IBM i not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EMFA) - 64GB (2x32GB) DDIMMs (2U), 3200 MHz, 16Gbit DDR5 Memory

This feature ships two 32 GB DDIMMs (2U) providing 64 GB of DDR5 memory. DRAM is 16Gbit and 3200 MHz.

- Attributes provided: Two 32 GB DDIMMs providing 64 GB of DDR5 memory
- Attributes required: Two empty 2U DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EMFB) - 128GB (2x64GB) DDIMMs (2U), 3200 MHz, 16Gbit DDR5 Memory

This feature ships two 64 GB DDIMMs (2U) providing 128 GB of DDR5 memory. DRAM is 16Gbit and 3200 MHz.

- Attributes provided: Two 64 GB DDIMMs providing 128 GB of DDR5 memory
- Attributes required: Two empty 2U DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EMFD) - 256GB (2x128GB) DDIMMs (4U), 3200 MHz, 16Gbit DDR5 Memory

This feature ships two 128 GB DDIMMs (4U) providing 256 GB of DDR5 memory. DRAM is 16Gbit and 3200 MHz.

- Attributes provided: Two 128 GB DDIMMs providing 256 GB of DDR5 memory
- Attributes required: Two empty 4U DDIMM slots
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

(#EMX0) - PCIe Gen3 I/O Expansion Drawer

(No Longer Available as of January 12, 2024)

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 (#EMXH) 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:
 - For Scale-up servers - One or two PCIe x16 to CXP Converter Card Adapter (#EJ24), one or two PCIe3 fanout modules (#EMXH), one or two Active Optical Cable CXP cable pairs (such as #ECCR or #ECCY), one power supply conduit (such as #EMXA).
 - For Scale-out servers - see requirements in Rack-integrated system with I/O expansion drawer section.
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EMXA) - AC Power Supply Conduit for PCIe3 Expansion Drawer

(No Longer Available as of January 12, 2024)

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: 2 (Initial order maximum: 2)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

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

(No Longer Available as of January 12, 2024)

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 to two CXP ports on a PCIe Optical Cable Adapter (only allowed to connect to #EJ24 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
- For Scale-up servers - PCIe3 Optical Cable Adapters (#EJ24) requires to use Optical Cables (#ECCR, ECCY, or #ECCZ)
- For Scale-out servers - see requirements in Rack-integrated system with I/O expansion drawer section.
- 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: 1 (Initial order maximum: 1)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#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: None

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

(#EN05) - 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.

#ENOS and #ENOT adapters are electronically identical. They are physically identical except #ENOS has a tail stock for full high PCIe slots and #ENOT 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: 10 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported through VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ENOU) - 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 copper 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.

#ENOU and #ENOV adapters are electronically identical. They are physically identical except #ENOU has a tail stock for full high PCIe slots and #ENOV 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: 10 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported through VIOS
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ENOW) - PCIe2 2-port 10/1GbE BaseT RJ45 Adapter

(No longer available as of August 12, 2024)

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.

#ENOW and #ENOX are electronically identical with the same CCIN of 2CC4. #ENOW has a full high tail stock and #ENOX 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: 10 (Initial order maximum: 10)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported through VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#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

i 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: 9 (Initial order maximum: 9)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

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

(No longer available as of May 13, 2024)

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

i **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: 9 (Initial order maximum: 9)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EN1E) - PCIe3 16Gb 4-port Fibre Channel Adapter

(No Longer Available as of January 12, 2024)

This PCIe Gen3 16 Gigabit quad-port optical fibre channel (FC) adapter is a high-performance x8 short form adapter based on the Marvell QLE2694L PCIe host bus adapter (6.6 inches x 2.371 inches). The adapter provides four ports of 16Gb fibre channel capability using SR optics. Each port can provide up to 3,200MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with Soldered Small Form Factor (SFF) optical transceivers installed. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 4, 8, and 16Gbps and will automatically negotiate to the highest speed possible. The adapter supports boot on IBM power with fcode.

Feature #EN1E and #EN1F are electronically identical. They differ physically only that the #EN1E has a tail stock for full height PCIe slots and the #EN1F has a short tail stock for low profile PCIe slots.

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

- i 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: 9 (Initial order maximum: 9)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

- i Note:** Assignment to the VIOS supported

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

(No Longer Available as of January 12, 2024)

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

i 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: 9 (Initial order maximum: 9)
- OS level required:
 - IBM i not supported
 - IBM i does not support this feature through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#EN1J) - PCIe4 32Gb 2-port Optical Fibre Channel Adapter

This PCIe 4.0 x8 dual-port 32 Gigabit optical fibre channel (FC) adapter is a high-performance short form adapter based on the Marvell QLE2772 PCIe host bus adapter (6.6 inches x 2.731 inches). The adapter provides two ports of 32Gb fibre channel capability using SR optics. Each port can provide up to 6,400MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with 32Gb SR optical transceivers installed. 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. The adapter supports boot on IBM power with fcode.

Feature #EN1J and #EN1K are electronically identical. They differ physically only that the #EN1J has a tail stock for full height PCIe slots and the #EN1K has a short tail stock for low profile PCIe slots.

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

i 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: 9 (Initial order maximum: 9)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

i Note: Assignment to the VIOS supported

(#EN1L) - PCIe4 32Gb 4-port Optical Fibre Channel Adapter

This PCIe 4.0 8x 4-port 32 Gigabit optical fibre channel (FC) adapter is a high-performance short form adapter PCIe host bus adapter (6.6 inches x 2.731 inches). The adapter provides four ports of 32Gb fibre channel capability using SR optics. Each port can provide up to 6,400MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with 32Gb SR optical transceivers installed. 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. The adapter supports boot on IBM power with fcode.

Feature #EN1L and #EN1M are electronically identical with the same CCIN of 2CFC. They differ physically only that the #EN1L has a tail stock for full height PCIe slots and the #EN1M has a short tail stock for low profile PCIe slots.

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

i 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 32Gb Optical FC
- Attributes required: Full height profile PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-01-2246, or later

- AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-05-2246, or later
- AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-03-2246, or later (planned availability date March 17, 2023)
- Red Hat Enterprise Linux 8.6, for POWER LE, or later
- Red Hat Enterprise Linux 9.0, for POWER LE, or later
- Red Hat OpenShift Container Platform, 4.11, or later
- IBM i dedicated (native) driver: IBM i 7.5 TR1, or later; IBM i 7.4 TR7, or later
- IBM i through VIOS NPIV: IBM i 7.5 TR1, or later; IBM i 7.4 TR7, or later; IBM i 7.3 TR13, or later
- IBM i through VIOS VSCSI supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS requires VIOS 3.1.4.10, or later

(#EN1N) - PCIe4 64Gb 2-port Optical Fibre Channel Adapter

This PCIe 4.0 8x 2-port 64 Gigabit optical fibre channel (FC) adapter is a high-performance short form adapter PCIe host bus adapter (6.6 inches x 2.731 inches). The adapter provides two ports of 64Gb fibre channel capability using SR optics. Each port can provide up to 12,800MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with 64Gb SR optical transceivers installed. The ports have LC type connectors and utilize shortwave laser optics. The adapter operates at link speeds of 16, 32, and 64Gbps and will automatically negotiate to the highest speed possible. The adapter supports boot on IBM power with fcode.

Feature #EN1N and #EN1P are electronically identical with the same CCIN of 2CFD. They differ physically only that the #EN1N has a tail stock for full height PCIe slots and the #EN1P has a short tail stock for low profile PCIe slots.

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 64Gb Optical FC
- Attributes required: Full height profile PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-01-2246, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-05-2246, or later
 - AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-03-2246, or later (planned availability date March 17, 2023)
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux 8.6, for POWER LE, or later
 - Red Hat Enterprise Linux 9.0, for POWER LE, or later
 - Red Hat OpenShift Container Platform, 4.11, or later
 - IBM i dedicated (native) driver: IBM i 7.5 TR1, or later; IBM i 7.4 TR7, or later
 - IBM i through VIOS NPIV: IBM i 7.5 TR1, or later; IBM i 7.4 TR7, or later; IBM i 7.3 TR13, or later
 - IBM i through VIOS VSCSI supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS requires VIOS 3.1.4.10, or later

(#EN26) - PCIe4 4-Port 25/10/1 GbE RoCE SFP28 Adapter

This PCIe Gen4 Ethernet adapter provides four 25/10/1GbE SFP28 ports. The adapter supports Ethernet NIC (Network Interface Card) traffic 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 25 GbE, IBM offers SFP28 Passive Copper 25 Gb Ethernet cables up to 2 m. SFP28 based transceivers are included on each end of these cables.

For 10 GbE, IBM offers Direct Attach Copper (DAC) cables up to 5 m. SFP-based transceivers are included on each end of these cables.

Transceivers: For 25 GbE, IBM qualifies and supports the 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.

Note: You must use RS-FEC error correction when the FC EB47 or any other 25GBASE-SR optical transceiver is installed in the FC EN24 or FC EN26 adapter. Using other types of error correction or no

error correction is not supported.

For 10 GbE, IBM qualifies and supports the 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.

Use multimode fiber optic cables with shortwave lasers that adhere to the following specifications:

- OM3 or OM4: Multimode 50/125 micron fiber, 2000 MHz x km bandwidth
- OM2: Multimode 50/125 micron fiber, 500 MHz x km bandwidth
- OM1: Multimode 62.5/125 micron fiber, 200 MHz x km bandwidth

Feature code #EN24 and #EN26 have identical electronics and function and CCIN (EC2A), but have different tail stock brackets. #EN24 is low profile and #EN26 is full high. The adapter is based on a Mellanox ConnectX-7 adapter which uses a ConnectX-7 Lx EN Network Controller.

Attributes:

- PCI Express 4.0 (up to 16GT/s) x8
- PCIe Gen 4.0 compliant, 1.1, 2.0, and 3.0 compatible
- RDMA over Converged Ethernet (RoCE)
- NIC and RoCE are concurrently supported
- NIC supported on all OSes
- IEEE 802.3ae (25 Gb or 10 Gb 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
- AIX Network Installation Manager (NIM) boot support

Limitations:

- 1GbE Base-T Transceiver RJ45 (FC EB48) not supported.
- Attributes provided: Ethernet x16 adapter
- Attributes required: Available PCIe slot
- Minimum required: 0
- Maximum allowed: 10 (Initial order maximum: 10)
- OS level required:
 - AIX Version 7.3 with the 7300-02 Technology Level and Service Pack 7300-02-02-2420, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-08-2420, or later

- Red Hat Enterprise Linux 9.2, or later, with Mellanox OFED 23.04, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later, with Mellanox OFED 23.04, or later
- SUSE Linux Enterprise Server 15, Service Pack 5, or later, with Mellanox OFED 23.04, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later, with Mellanox OFED 23.04, or later
- AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-04-2420, or later (planned availability - July 26, 2024)
- IBM i 7.5 TR4, or later and IBM i 7.4 TR10, or later support dedicated NIC and RoCE and native SR-IOV for the NIC and RoCE functions
 - RoCE is used only by IBM Db2 Mirror for i
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

Note: Assignment to the VIOS requires :

- VIOS 4.1.0.21, or later
- VIOS 3.1.4.41, or later

Note: Feature EB48 not supported.

(#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. If you are using N_Port ID Virtualization (NPIV), multiple initiator capability is provided. The ports are SFP+ and include an optical SR transceiver. The ports have little connector-type (LC) and utilize shortwave laser optics. The adapter operates at link speeds of 4, 8, and 16 Gbps and it will automatically negotiate to the highest speed possible.

The adapter connects to a Fibre Channel switch at 4 Gb, 8 Gb, or 16 Gb. It can directly attach to a device without a switch at 16 Gb. The adapter without a Fibre Channel switch attached is not supported at 4 Gb or 8 Gb.

NPIV capability is supported through Virtual I/O Server (VIOS).

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.

The adapter has the following features:

- The adapter is compliant with the PCIe base and Card Electromechanical (CEM) 2.0 specifications with the following characteristics:
 - Provides an x8 lane link interface at 14.025 Gbps, 8.5 Gbps, or 4.25 Gbps (automatic negotiation with system)
 - Provides support for one Virtual Channel (VC0) and one Traffic Class (TC0)
 - Provides configuration and I/O memory read and write, completion, and messaging capabilities
 - Provides support for 64-bit addressing
 - Provides error correction code (ECC) and error protection functions
 - Provides link cyclic redundancy check (CRC) on all PCIe packets and message information
 - Provides a large payload size of 2048 bytes for read and write functions
 - Provides a large read request size of 4096 bytes
- The adapter is compatible with 4, 8, and 16 Gb Fibre Channel interface with the following characteristics:
 - Provides for automatic negotiation between 4 Gb, 8 Gb, or 16 Gb link attachments
 - Provides support for the following Fibre Channel topologies: point-to-point (16 Gb only) and fabric
 - Provides support for Fibre Channel class 3
 - Provides a maximum Fibre Channel throughput that is achieved by using full duplex hardware support
- The adapter provides an end-to-end data path parity and CRC protection, including internal data path random-access memory (RAM)
- Provides architectural support for multiple upper layer protocols
- Provides comprehensive virtualization capabilities with support for N_Port ID Virtualization (NPIV) and virtual fabric (VF)
- Provides support for message signaled interrupts extended (MSI-X)
- Provides support for 255 VFs and 1024 MSI-X
- Provides an internal, high-speed static random-access memory (SRAM) memory
- Provides ECC protection of local memory that includes single-bit correction and double-bit protection
- Provides an embedded shortwave optical connection with diagnostics capability
- Provides support for an on-board context management by firmware:
 - Up to 8192 FC port logins
 - I/O multiplexing down to the Fibre Channel frame level
- Provides data buffers capable of supporting 64+ buffer-to-buffer (BB) credits per port for shortwave applications
- Provides link management and recovery that is handled by firmware
- Provides on-board diagnostic capability accessible by an optional connection
- Provides a performance up to 16 Gbps full duplex

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

i 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: 9 (Initial order maximum: 9)
- OS level required:
 - IBM i supported
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#EN2L) - PCIe4 32Gb 4-port Optical Fibre Channel Adapter

This PCIe 4.0 16x 4-port 32 Gigabit optical fibre channel (FC) adapter is a high-performance short form adapter PCIe host bus adapter (6.6 inches x 2.731 inches). The adapter provides four ports of 32Gb fibre channel capability using SR optics. Each port can provide up to 6,400MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with 32Gb SR optical transceivers installed. 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. The adapter supports boot on IBM power with fcode.

Feature #EN2L and #EN2M are electronically identical with the same CCIN of 2CFC. They differ physically only that the #EN2L has a tail stock for full height PCIe slots and the #EN2M has a short tail stock for low profile PCIe slots.

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

- OM4/OM5 - multimode 50/125 micron fibre, 4700 MHz*km bandwidth with LC connectors 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 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 8GFC: 0.5m - 50m o 16GFC: 0.5m - 35m o 32GFC: 0.5m - 20m

i 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 32Gb Optical FC
- Attributes required: Full height profile PCIe Gen4 slot
- Minimum required: 0
- Maximum allowed: 2 (Initial order maximum: 2)
- OS level required:
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-06-2320, or later
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-02-2320, or later
 - AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-04-2246, or later (planned availability date 8/4/2023)
 - IBM i dedicated (native) driver: IBM i 7.5 TR2, or later; IBM i 7.4 TR8, or later
 - IBM i through VIOS NPIV: IBM i 7.5 TR2, or later; IBM i 7.4 TR8, or later; IBM i 7.3 TR13, or later
 - IBM i through VIOS VSCSI supported
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15 Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - Assignment to the VIOS requires VIOS 3.1.4.20, or later
 - EN2L is not supported in I/O expansion drawer (#EMX0)
 - Assignment to the VIOS requires VIOS 3.1.4.20, or later
 - EN2L is not supported in I/O expansion drawer (#EMX0)

(#EN2N) - PCIe4 64Gb 2-port Optical Fibre Channel Adapter

This PCIe 4.0 8x 2-port 64 Gigabit optical fibre channel (FC) adapter is a high-performance short form adapter PCIe host bus adapter (6.6 inches x 2.731 inches). The adapter provides two ports of 64Gb fibre channel capability using SR optics. Each port can provide up to 12,800 MBps bandwidth per port.

Each port provides single initiator capability over a fibre link or with NPIV, multiple initiator capability is provided. The adapter ships with 64Gb SR optical transceivers installed. 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. The adapter supports boot on IBM power with fcode.

Feature #EN2N and #EN2P are electronically identical with the same CCIN of 2CFD. They differ physically only that the #EN2N has a tail stock for full height PCIe slots and the #EN2P has a short tail stock for low profile PCIe slots.

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

- OM4/OM5 - multimode 50/125 micron fibre, 4700 MHz*km bandwidth with LC connectors
 - o 16GFC: 0.5m - 125m
 - o 32GFC: 0.5m - 100m
 - o 64GFC: 0.5m - 100m
- OM3 - multimode 50/125 micron fibre, 2000 MHz*km bandwidth with LC connectors
 - o 16GFC: 0.5m - 100m
 - o 32GFC: 0.5m - 70m
 - o 64GFC: 0.5m - 70m
- OM2 - multimode 50/125 micron fibre, 500 MHz*km bandwidth with LC connectors
 - o 16GFC: 0.5m - 35m
 - o 32GFC: 0.5m - 20m
 - o 64GFC: ? N/A

i 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 64Gb Optical FC
- Attributes required: Full height profile PCIe Gen4 slot

i Note: Assignment to the VIOS requires VIOS 3.1.4.20, or later

i Note: Assignment to the VIOS requires VIOS 3.1.4.20, or later

- Minimum required: 0
- Maximum allowed: 9 (Initial order maximum: 9)
- OS level required:
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-06-2320, or later

- AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-02-2320, or later
 - AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-04-2246, or later (planned availability date 8/4/2023)
 - IBM i dedicated (native) driver: IBM i 7.5 TR2, or later; IBM i 7.4 TR8, or later
 - IBM i through VIOS NPIV: IBM i 7.5 TR2, or later; IBM i 7.4 TR8, or later; IBM i 7.3 TR13, or later
 - IBM i through VIOS VSCSI supported
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15 Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
 - CSU: Yes
 - Return parts MES: No



Note: Assignment to the VIOS requires VIOS 3.1.4.20, or later

(#EN2W) - PCIe3 4-port 10GbE BaseT RJ45 Adapter

PCIe Gen3 short x8 adapter which provides four 10G-BaseT ports. The ports are RJ45. The ports default to auto negotiate the highest speed either 10Gb (10GBaseT) or 1Gb (1000BaseT) full duplex. Each RJ45 port's configuration is independent of the other. The adapter supports Ethernet NIC (Network Interface Card) traffic.

Supported distances per cable type and connection speed:

- 10GBASE-T: Distances up to 100 m using CAT6A or better
- 1000BASE-T: Distances up to 100 m using CAT5e, CAT6, or CAT6A

Features #EN2W and #EN2X are electronically identical with the same CCIN of 2F04. #EN2W has a full high tail stock and #EN2X 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), IEEE, 802.1p priority, IEEE 802.1Q VLAN tagging, IEEE 802.3x and ab flow control, IEEE 802.3ad LACP
- Multiple MAC addresses / promiscuous mode (for PowerVM/VIOS) per interface
- Supports MSI-X for load-balancing of interrupt handling between multiple cores/CPUs
- Supports Interrupt Moderation
- Ether II and IEEE 802.3 encapsulated frames
- Supports Jumbo frames
- Supports Link Layer Discovery Protocol (LLDP)
- 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
- Supports firmware updates

- AIX and Linux provide software iSCSI support through the adapter
- Attributes provided: 4-ports 10G-BaseT Adapter
- Attributes required: Full high profile PCIe Gen3 slot
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required:
 - IBM i supported through VIOS
 - IBM i 7.5 TR2, or later
 - IBM i 7.4 TR8, or later
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-01-2246, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-05-2246, or later
 - AIX Version 7.3 with the 7300-00 Technology Level and Service Pack 7300-00-03-2246, or later (planned availability date March 17, 2023)
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux 8.6, for POWER LE, or later
 - Red Hat OpenShift Container Platform, 4.11, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS requires VIOS 3.1.3.21, or later; VIOS 3.1.2.40, or later

i Note: Up to 2 #EN2W adapters per FOM (FC #EMXH or FC #ENZF) are allowed or 4 #EN2W adapters per Expansion Drawer FC #EMX0 (with 2x#EMXH) or FC #ENZ0 (with 2x #ENZF).

(#EN2Z) - PCIe 4-Port 1GbE Adapter

This short PCIe Gen1 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 #EN2Y and #EN2Z are electronically identical and have the same CCIN of 5775. Feature #EN2Y indicates a low profile tail stock while feature #EN2Z indicates a full high tail stock.

Attributes:

- 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: High-Profile PCIe slot
 - Minimum required: 0
 - Maximum allowed: 5 (Initial order maximum: 5)
 - OS level required:
 - IBM i 7.5 TR4, or later
 - IBM i 7.4 TR10, or later
 - Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - Red Hat OpenShift Container Platform 4.13, or later
 - AIX Version 7.3 with the 7300-02 Technology Level and Service Pack 7300-02-02-2420, or later
 - AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-08-2420, or later
 - AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-04-2420, or later
(planned availability - July 26, 2024)
- Initial Order/MES/Both/Supported: Both
 - CSU: Yes
 - Return parts MES: No

(#ENS1) - 188 GB IBM i NVMe Load Source Namespace size

(No Longer Available as of August 11, 2023)

Specify code indicates a Namespace Size when an IBM i NVMe Load Source device specify feature code is on the order.

- Attributes provided: Load Source Namespace size
- Attributes required: IBM i NVMe Load Source device specify feature
- 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

(#ENS2) - 393 GB IBM i NVMe Load Source Namespace size

(No Longer Available as of August 11, 2023)

Specify code indicates a Namespace Size when an IBM i NVMe Load Source device specify feature code is on the order.

- Attributes provided: Load Source Namespace size
- Attributes required: IBM i NVMe Load Source device specify feature
- 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

(#ENSA) - 200 GB IBM i NVMe Load Source Namespace size

Specify code indicates a Namespace Size when an IBM i NVMe Load Source device specify feature code is on the order.

- Attributes provided: Load Source Namespace size
- Attributes required: IBM i NVMe Load Source device specify feature
- 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

(#ENSB) - 400 GB IBM i NVMe Load Source Namespace size

Specify code indicates a Namespace Size when an IBM i NVMe Load Source device specify feature code is on the order.

- Attributes provided: Load Source Namespace size
- Attributes required: IBM i NVMe Load Source device specify feature
- 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

(#ENSM) - Specify Code Configure all IBM i Namespaces

This Specify code instructs Manufacturing to create multiple namespaces of the same size, as indicated by the IBM i Load Source Namespace specify code size, on the U.2 NVMe load source mirrored device pair. When using this feature, the U.2 NVMe load source device and its mirror device

must be identical IBM i NVMe device feature codes. All of these mirrored Namespaces will be added to the System Auxiliary Storage Pool (ASP). If there are more than two U.2 NVMe device only the first two devices will be configured, additional devices will remain unconfigured.

Feature #ENSM is only allowed on initial system orders and feature #ENSM is allowed on a storage configuration with U.2 NVMe devices only not a combination of NVMe and SAS HDD/SSD. Feature #ENSM is also not allowed with feature code #0837 - SAN Load Source Specify (Boot from SAN). Feature #ENSM is also not applicable with PCIe NVMe Add In Cards, only U.2 devices are configurable. Feature #ESNM only applies to the P05 IBM i SW tier configs which are:

- 9009-22G with the 1 core processor (feature #EP5Y)
- 9009-41G with the 4 core processor (feature #EP50)
- 9105-41B with the 4 core processor (feature #EPG0)
- Attributes provided: Create the maximum number of Namespaces of the size indicated by the IBM i Load Source Namespace specify code on the NVMe Load Source devices
- Attributes required: Feature #2145 Primary Operating System Indicator - IBM i plus feature #5000 Software Preload Required or feature #0205 RISC-TO-RISC Data Migration plus identical IBM i NVMe U.2 devices plus IBM i NVMe load source Namespace size and the system is not partitioned (single/un-partitioned only)
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required: IBM i supported with the 4-core processor (#EPG0)
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#ENZ0) - PCIe Gen4 I/O Expansion Drawer

The PCIe Gen4 I/O Expansion Drawer (#ENZ0) is a 4U high, 19-inch wide, PCIe Gen4 based rack mountable I/O drawer that is available as a feature of Power10 Servers.

The PCIe Gen4 I/O Expansion Drawer (#ENZ0) replaces the PCIe Gen3 I/O Expansion Drawer (#EMX0). There is no upgrade path from PCIe Gen3 I/O Expansion Drawer (#EMX0) to PCIe Gen4 I/O Expansion Drawer (#ENZ0).

The PCIe Gen4 FanOut Module (#ENZF) is the fan out module (FOM) for placement in PCIe Gen4 I/O Expansion Drawer (#ENZ0). Each FOM provides six PCIe Gen4 slots (4 x16 & 2 x8) slots. All six slots, including the x8 slots, use x16 connectors. A fully populated PCIe Gen4 I/O Expansion Drawer (#ENZ0) with two PCIe Gen4 FanOut Module (#ENZF) provides twelve PCIe Gen4 slots (8 x16 & 4 x8). Each PCIe Gen4 FOM (#ENZF) only connects to PCIe x16 to CXP Converter Card features #EJ24 or #EJ2A.

For Power S1024, S1014 and L1014 server the PCIe slots are enabled to support the PCIe x16 to CXP Converter Card (FC EJ2A) that is used to attach expansion drawers and requires PCIe Gen4 CXP Active Optional Cables, such as features #ECLX/#ECLY or Copper Cable such as feature #ECLS.

- Attributes provided: PCIe Gen4 I/O Expansion Drawer
- Attributes required: One or two PCIe Gen4 FanOut Module
- Minimum required: 0

- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux 8.8, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.8, or later
 - Red Hat Openshift Container Platform 4.13, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
- AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 7200-05-07-2346, or later
- AIX Version 7.3 with the 7300-02 Technology Level and Service Pack 7300-02-01-2346, or later
- AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 7300-01-03-2346, or later
(Planned Availability January 26, 2024)
- IBM i 7.5 TR3, or later
- IBM i 7.4 TR9, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Not allowed with the deskside/tower configuration.

i Note: Assignment of the VIOS requires:

- VIOS 3.1.4.30, or later
- VIOS 4.1.0.10, or later

i Note:

- Power firmware minimum level FW1050
- If using HMC, then minimum level HMC 10.3.1050 is required

#ENZF - PCIe4 6-Slot Fanout Module for PCIe Gen4 I/O Expansion Drawer

The PCIe Gen4 FanOut Module (#ENZF) is the fan out module (FOM) for placement in PCIe Gen4 I/O Expansion Drawer (#ENZ0). This FOM is a Switched slot module due to the slots are under a switch that resides within the module. Each FOM provides 6 Gen4 PCIe slots (4 x16 and 2 x8) slots. All 6 slots including the x8 slots use x16 connectors. A PCIe Gen4 I/O Expansion Drawer (#ENZ0) with two PCIe Gen4 FanOut Module (#ENZF) provides 12 Gen4 PCIe slots (8 x16 and 4 x8).

- Attributes provided: PCIe Gen4 FanOut Module
- Attributes required: One PCIe CXP host connection cable
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)

- OS level required: See feature ENZO
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

 **Note:** Not allowed with the desktop/tower configuration.

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

(No Longer Available as of November 10, 2023)

This feature codes provides firmware commands to deactivate LPM.

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

(#EPF6) - One Processor Core Activation for EPG2

Entitlement for one processor core activation.

- Attributes provided: Processor core activation for EPG2
- Attributes required: Feature EPG2
- Minimum required: 0
- Maximum allowed: 8 (Initial order maximum: 8)
- OS level required: See feature EPG2
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPFT) - One Processor Core Activation for EPG0

Entitlement for one processor core activation.

- Attributes provided: Processor core activation for EPG0
- Attributes required: Feature EPG0
- Minimum required: 0
- Maximum allowed: 4 (Initial order maximum: 4)
- OS level required: See feature EPG0
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#EPFZ) - One Processor Core Activation for EPH8

Entitlement for one processor core activation.

- Attributes provided: Processor core activation for EPH8
- Attributes required: Feature EPH8
- Minimum required: 0
- Maximum allowed: 24 (Initial order maximum: 24)
- OS level required: See feature EPH8
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EPG0) - 4-core Typical 3.0 to 3.90 GHz (max) Power10 Processor

4-core Typical 3.0 to 3.90 GHz (max) Power10 Processor card. Available in quantity of one.

- Attributes provided: 4-core processor card
- Attributes required: One processor card slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i 7.5 and PTF SI80676, or later
 - IBM i 7.4 TR6 and PTF SI80673, or later
 - IBM i 7.3 TR12 and PTF SI80671, or later
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No
 - Both to enable ordering as bulk MES. This is for OEM clients only.
 - Assignment to the VIOS supported

(#EPG2) - 8-core Typical 3.00 to 3.90 GHz (max) Power10 Processor

8-core Typical 3.00 to 3.90 GHz (max) Power10 Processor card. Available in quantity of one.

- Attributes provided: 8-core processor card
- Attributes required: One processor card slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
 - IBM i 7.5 and PTF SI80676, or later
 - IBM i 7.4 TR6 and PTF SI80673, or later
 - IBM i 7.3 TR12 and PTF SI80671, or later
 - AIX supported

- Linux supported
- Assignment to the VIOS supported
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No
 - For Rack model only and not supported on a tower/deskside configuration.
 - Both to enable ordering as bulk MES. This is for OEM clients only.
 - Assignment to the VIOS supported

(#EPH8) - 24-core Typical 2.75 to 3.90 GHz (max) Power10 Processor

24-core Typical 2.75 to 3.90 GHz (max) Power10 Processor card. Available in quantity of one.

- Attributes provided: 24-core processor card
- Attributes required: One processor card slot
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - AIX supported
 - IBM i not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: No
- Return parts MES: No

Editor Note:

- Supported with 2x 1600W power supplies only.
- Feature 2319 is not supported with 24-core processor feature EPH8

(#EPTH) - Horizontal PDU Mounting Hardware

(No Longer Available as of February 27, 2024)

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

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, #6667, #ELC1 or #ELC2.

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: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EPTL) - High Function 9xC19 PDU 3-Phase

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: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes

- Return parts MES: No

(#EPTN) - High Function 12xC13 PDU

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/EPLT 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, #6667, #ELC1 or #ELC2.

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: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EPTQ) - High Function 12xC13 PDU 3-Phase

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: 0)
- OS level required: None
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EPV0) - 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: 24 (Initial order maximum: 24)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#EPVT) - PowerVM Enterprise Edition

This feature allows the customer to create partitions that are in units of less than 1 CPU (sub-CPU LPARs) and allows the same system I/O to be virtually allocated to these partitions. When PowerVM is installed in the system, all activated processors must have the PowerVM feature. A fully activated 4-core system requires that four of this feature be ordered.

An encrypted key is supplied to the customer and is installed on the system, authorizing the partitioning at the sub-processor level.

PowerVM Enterprise Edition also includes Live Partition Mobility, which allows for the movement of a logical partition from one Power8, Power9 or Power10 with no application downtime.

Note: If feature EPVT is ordered, the quantity ordered must be equal to the number of active processors.

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

(#ERKZ) - Rack-Mount Rail Tower to Rack Conversion Kit

The IBM S1014 Tower-to-Rack conversion hardware kit is available through the MES feature ERKZ that you need to convert a 4U server (MTM 9105-41B) from a tower model to a rack model. You can then install the server into a 19-inch rack enclosure.

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

(#ES1E) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA

SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES1E and #ES1F are physically identical drives with the same CCIN of 59B8. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES1E indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES1F indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ES1F) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA

SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES1E and #ES1F are physically identical drives with the same CCIN of 59B8. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES1E indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES1F indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES1G) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES1G and #ES1H are physically identical drives with the same CCIN of 59B9. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES1G indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES1H indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ES1H) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES1G and #ES1H are physically identical drives with the same CCIN of 59B9. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES1G indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES1H indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES1K) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i

Enterprise 800 GB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES1K has CCIN number of 5947 and indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES30) - 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 with HD narrow connectors can be attached. A max of 4 tape drives per adapter can be attached using four AE1 cables.

Feature #ES30 (full high) and feature #ES31 (low profile) are electronically the same adapter with the same 57B4 CCIN, but differ in that their tailstocks fit different size PCIe slots.

Notes:

- Adapter uses a Mini-SAS HD narrow connector and AE1 feature #ECBY SAS cable or 4m Mini-SAS HD/Mini-SAS 1X Cable such as Storage feature #5507.
- 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: 6 (Initial order maximum: 6)
- OS level required:
 - AIX supported
 - Linux is supported only with VIOS
 - IBM i is supported only with VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
-

Note:

- This adapter feature IS NOT supported on a tower/deskside 41B (having one of these CEC cover set features EJUY, EJUZ, EJVY, and EJVZ).
- Assignment to the VIOS supported

(#ES3A) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 800 GB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3A has CCIN number of 5B53 and indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of

write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 800 GB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES3B) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3B and #ES3C are physically identical drives with the same CCIN of 5B52. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3B indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3C indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ES3C) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 1.6 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3B and #ES3C are physically identical drives with the same CCIN of 5B52. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3B indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3C indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be

replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES3D) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3D and #ES3E are physically identical drives with the same CCIN of 5B51. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3D indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3E indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ES3E) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 3.2 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3D and #ES3E are physically identical drives with the same CCIN of 5B51. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3D indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3E indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be

replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES3F) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3F and #ES3G are physically identical drives with the same CCIN of 5B50. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3F indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3G indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ES3G) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i

(No Longer Available as of October 24, 2023)

Enterprise 6.4 TB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3F and #ES3G are physically identical drives with the same CCIN of 5B50. Different feature codes to help the IBM configuration tools understand how the NVMe is used. Feature ES3F indicates usage by AIX, Linux or VIOS in which the SSD is formatted in 4096 byte sectors. Feature ES3G indicates usage by IBM i in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be

replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES3H) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux

(No Longer Available as of October 24, 2023)

Enterprise 800 GB NVMe SFF U.2 15mm SSD (Solid State Drive) is a Peripheral Component Interconnect Express (PCIe) generation 4 (Gen4) drive. The SSD can be used in any U.2 15mm NVMe slot in the system and uses Non-Volatile Memory Express (NVMe). NVMe is a high performance architecture and command protocol that can read/write flash memory. Compared to a SAS or SATA SSD, the NVMe SSD provides more read/write input/output operations per second (IOPS) and larger throughput (GB/sec).

Features #ES3H has CCIN number of xxxx and indicates usage by AIX/ Linux in which the SSD is formatted in 4160 byte sectors.

This Enterprise solid-state drive is rated at 3 DWPD (Drive Writes Per Day) calculated over a 5-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating are fully supported and will maintain high reliability and MTBF.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but perform 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 SSD if enabled by the operating system (OS) and system administrator. Customers are recommended to monitor SMART log critical information via the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSD's that have not reached the maximum number of write cycles. SSD's that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Boot supported. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe NVMe device can have 64 namespaces per device.

- Attributes provided: 800 GB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported through VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4B) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - AIX supported
 - Red Hat Enterprise Linux 8.10, or later

- Red Hat Enterprise Linux 9.2, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
- SUSE Linux Enterprise Server 15, Service Pack 5, or later
- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
- OpenShift Container Platform 4.13, or later
- IBM i requires VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4C) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5 TR4, or later
 - IBM i 7.4 TR10, or later
 - AIX not supported

- Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4D) - Enterprise 3.2 TB PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - AIX supported
 - Red Hat Enterprise Linux 8.10, or later
 - Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - Red Hat OpenShift Container Platform 4.13, or later
 - IBM i requires VIOS

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

(#ES4E) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5 TR4, or later
 - IBM i 7.4 TR10, or later
 - AIX not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4F) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - AIX supported
 - Red Hat Enterprise Linux 8.10, or later
 - Red Hat Enterprise Linux 9.2, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.2, or later
 - SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 5, or later
 - Red Hat OpenShift Container Platform 4.13, or later
 - IBM i requires VIOS
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES4G) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i 7.5 TR4, or later
 - IBM i 7.4 TR10, or later
 - AIX not supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5A) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe

SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5A and #ES5B are physically identical drives with the same CCIN of 5B53.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 800 GB PCIe4 SSD NVMe
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.0, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5B) - Enterprise 800GB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-

performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5A and #ES5B are physically identical drives with the same CCIN of 5B53.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 800 GB PCIe4 SSD NVMe
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5C) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully

supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5C and #ES5D are physically identical drives with the same CCIN of 5B52.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.0, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5D) - Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5C and #ES5D are physically identical drives with the same CCIN of 5B52.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 1.6 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5E) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5E and #ES5F are physically identical drives with the same CCIN of 5B51.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.0, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5F) - Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5E and #ES5F are physically identical drives with the same CCIN of 5B51.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 3.2 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5G) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5G and #ES5H are physically identical drives with the same CCIN of 5B50.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported through VIOS
 - AIX supported
 - Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux 9.0, or later
 - Red Hat OpenShift Container Platform 4.11, or later
 - SUSE Linux Enterprise Server 15, Service Pack 4, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.6, or later
 - Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 9.0, or later
 - SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15, Service Pack 4, or later
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES5H) - Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for IBM i

The Enterprise NVMe small form factor (SFF) U.2 15 mm SSD is a PCIe Gen4 device. This device supports boot on Power and can be used in any U.2 15mm NVMe slot in the system. NVMe is a high-performance architecture and command protocol that can read and write flash memory. Compared to a serial-attached SCSI (SAS) SSD or a Serial Advanced Technology Attachment (SATA) SSD, the NVMe SSD provides more read and write input/output operations per second (IOPS) and larger throughput (GB/sec).

This Enterprise SSD is rated at three Drive Writes Per Day (DWPD) calculated over a five-year period for 100% (4K bytes or larger) random write workloads. Use for workloads within this rating is fully supported and will maintain high reliability and mean time between failures (MTBF).

Features #ES5G and #ES5H are physically identical drives with the same CCIN of 5B50.

The nature of the workload has a great impact on the maximum write capacity. If a high percentage of more sequentially oriented writes is used instead of random writes, the maximum write capacity will be larger. Writes past the SSD's maximum write capacity will continue to work for some period of

time, but they will perform 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 SSD if enabled by the operating system (OS) and system administrator. IBM recommends that you monitor SMART log critical information through the appropriate OS utility to observe drive life remaining information. IBM NVMe SSD failures will be replaced during the standard warranty and maintenance period for SSDs that have not reached the maximum number of write cycles. SSDs that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Data redundancy on a failed SSD may be provided by OS mirroring or software RAID wherever applicable.

This PCIe4 NVMe device can have 64 namespaces per device and works with the previous generation of NVMe devices that manage the same custom card identification number (CCIN).

- Attributes provided: 6.4 TB PCIe4 NVMe SSD
- Attributes required: SFF U.2 slot
- Minimum required: 0
- Maximum allowed: 16 (Initial order maximum: 16)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ES94) - 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 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.

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 #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 Power9/Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ES95) - 387GB Enterprise SAS 4k SFF-2 SSD for IBM i

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.

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 #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 cannot be reformatted to 5xx drives (or vice versa).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#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 Power9/Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#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 Power9/Power10 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: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#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 Power9/Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESBB) - 387GB Enterprise SAS 4k SFF-2 SSD for IBM i

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. The 4k drives cannot be reformatted to 5xx drives (or vice versa).

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. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power9/Power10 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller

- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESBH) - 775GB Enterprise SAS 4k SFF-2 SSD for IBM i

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. The 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. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported

- 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 Power9/Power10 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).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

- i Note:** Assignment to the VIOS supported

(#ESBM) - 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i

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. The 4k drives cannot be reformatted to 5xx drives (or vice versa).

- 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. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESCO) - S&H - No Charge

(No longer available as of August 8, 2023)

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

(#ESC6) - S&H-b

(No longer available as of August 8, 2023)

Shipping and handling

- 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

(#ESCT) - Virtual Capacity Expedited Shipment

This feature will instruct the Manufacture scheduling team to schedule shipment of orders with only activation features immediately (within 24 hours). Set (ESCT = 1) to trigger the expedite and receive and electronic notification. Set (ESCT = 0) to receive the paper notification and normal order scheduling.

- Attributes provided: None
- 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

(#ESCZ) - iSCSI SAN Load Source Specify for AIX

Indicates that an LAN adapter is being used as the Load Source for the AIX operating system.

- Attributes provided: iSCSI load source placement specify
- Attributes required: LAN adapter
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - AIX supported

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

(#ESEU) - 571GB 10K RPM SAS SFF- HDD 4K for IBM i

(No longer available as of January 12, 2024)

571 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. Disk is formatted for 4224 byte sectors. If reformatted to 4096 byte sectors, its capacity would be 500 GB and it would not have the 4224 byte additional data integrity protection. Reformatting large drives takes significant time.

Features #ESEU and #ESEV are physically identical drives with the same 59D2 CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESEV indicates usage by AIX, Linux or VIOS. #ESEU indicates usage by IBM i.

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
- Attributes provided: 571GB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESEV) - 600GB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux

(No longer available as of January 12, 2024)

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.

Features #ESEU and #ESEV are physically identical drives with the same 59D2 CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESEV indicates usage by AIX, Linux or VIOS. #ESEU indicates usage by IBM i.

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

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.

- Attributes provided: 571GB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESF2) - 1.1TB 10K RPM SAS SFF-2 HDD 4K for IBM i

(No Longer Available as of May 12, 2023)

1.14 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. Disk is formatted for 4224 byte sectors. If reformatted to 4096 byte sectors, its capacity would be 1.2 TB and it would not have the 4224 byte additional data integrity protection. Reformatting large drives takes significant time.

Features #ESF2 and #ESF3 are physically identical drives with the same 59DA CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESF3 indicates usage by AIX, Linux or VIOS. #ESF2 indicates usage by IBM i.

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
- Attributes provided: 1.1TB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - IBM i supported

- Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESF3) - 1.2TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux

(No Longer Available as of May 12, 2023)

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.

Features #ESF2 and #ESF3 are physically identical drives with the same 59DA CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESF3 indicates usage by AIX, Linux or VIOS. #ESF2 indicates usage by IBM i.

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

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.

- Attributes provided: 1.2TB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESFS) - 1.7TB 10K RPM SAS SFF-2 HDD 4K for IBM i

(No Longer Available as of May 12, 2023)

1.71 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. Disk is formatted for 4224 byte sectors. If reformatted to 4096 byte sectors, its capacity would be 1.8 TB and it would not have the 4224 byte additional data integrity protection. Reformatting large drives takes significant time.

Features #ESFS and #ESFT are physically identical drives with the same 59DD CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESFT indicates usage by AIX, Linux or VIOS. #ESFS indicates usage by IBM i.

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
- Attributes provided: 1.7TB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESFT) - 1.8TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux

(No Longer Available as of May 12, 2023)

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.

Features #ESFS and #ESFT are physically identical drives with the same 59DD CCIN. Different feature codes help the IBM configuration tools understand how the HDD is used. #ESFT indicates usage by AIX, Linux or VIOS. #ESFS indicates usage by IBM i.

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

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.

- Attributes provided: 1.8TB 10K RPM SFF-2 Disk 4K
- Attributes required: one SFF-2 SAS bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESGV) - 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 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.

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 #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 Power9/Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESGZ) - 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 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.

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 Power9/Power10 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: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

 **Note:** Assignment to the VIOS supported

(#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 Power10 servers, see the Terms and Conditions section 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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESJ1) - 931GB Mainstream SAS 4k SFF-2 SSD for IBM i

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 cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

- 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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESJ3) - 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i

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 cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

- 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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESJ5) - 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i

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)
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931 GB	1700
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1.86 TB	3399
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3.72 TB	6799
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7.45 TB	13601
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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.

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: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

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 Power9/Power10 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: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESJ7) - 7.45TB Mainstream SAS 4k SFF-2 SSD for IBM i

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.

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: 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: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and

Conditions section 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.

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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESJK) - 931GB Mainstream SAS 4k SFF-2 SSD for IBM i

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.

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: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESJM) - 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i

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 cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

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 Power9/Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESJP) - 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i

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.

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: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- 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 Power10 servers, see the Terms and Conditions section 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.

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 Power9/Power10 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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESJR) - 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i

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.

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: 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: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes

- Return parts MES: No

(#ESK1) - 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESK1 CCIN is 5B16. Different feature codes to help the IBM configuration tools understand how the SSD is used. ESK1 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 Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

- i Note:** Assignment to the VIOS supported

(#ESK3) - 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESK3 CCIN is 5B17. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ESK3 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 Power10 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).

- 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.

- Attributes provided: one 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

#ESK8) - 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESK8 and #ESK9 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 ESK8 indicates usage by AIX, Linux or VIOS. Feature ESK9 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 Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

- i Note:** Assignment to the VIOS supported

#ESK9) - 387GB Enterprise SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESK8 and #ESK9 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 ESK8 indicates usage by AIX, Linux or VIOS. Feature ESK9 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 POWER9 system units (SFF-3) or in older SFF-1 SAS bays. The 4k drives cannot be reformatted to 5xx drives (or vice versa).

- 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. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

#ESKC) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESKC and #ESKD 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 ESKC indicates usage by AIX, Linux or VIOS. Feature ESKD 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 Power10 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKD) - 775GB Enterprise SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESKC and #ESKD 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 ESKC indicates usage by AIX, Linux or VIOS. Feature ESKD 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 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESKG) - 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESKG and #ESKH 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 ESKG indicates usage by AIX, Linux or VIOS. Feature ESKH 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 Power10 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).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKH) - 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ESKG and #ESKH 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 ESKG indicates usage by AIX, Linux or VIOS. Feature ESKH 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 POWER9 system units (SFF-3) or in older SFF-1 SAS bays. The 4k drives cannot be reformatted to 5xx drives (or vice versa).

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. If there are 4k usage concerns, check with the application provider to ensure compatibility with 4K byte sector drives.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESKK) - 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKK and #ESKM are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKK indicates usage by AIX, Linux or VIOS. #ESKM indicates usage by IBM i.

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 Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 931 GB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKM) - 931GB Mainstream SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKK and #ESKM are physically identical drives with the same 5B29 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKK indicates usage by AIX, Linux or VIOS. #ESKM indicates usage by IBM i.

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 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: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESKP) - 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKP and #ESKR are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKP indicates usage by AIX, Linux or VIOS. #ESKR indicates usage by IBM i.

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 Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 1.86 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKR) - 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKP and #ESKR are physically identical drives with the same 5B21 CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKP indicates usage by AIX, Linux or VIOS. #ESKR indicates usage by IBM i.

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 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: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESKT) - 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKT and #ESKV are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKT indicates usage by AIX, Linux or VIOS. #ESKV indicates usage by IBM i.

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 Power10 system unit's SFF-3 bays. JBOD formatting of 4096 byte sectors is not tested or supported. Drive can not be reformatted to 5xx byte sectors. 5xx and 4k drives cannot be mixed in the same array. Older SAS adapters such as PCIe2 or earlier do not support 4k drives.
- Attributes provided: 3.72 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKV) - 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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

7.44 TB 13601

Features #ESKT and #ESKV are physically identical drives with the same 5B2D CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKT indicates usage by AIX, Linux or VIOS. #ESKV indicates usage by IBM i.

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 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: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESKX) - 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No Longer Available as of May 12, 2023)

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

Features #ESKX and #ESKZ are physically identical drives with the same 5B2F CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKX indicates usage by AIX, Linux or VIOS. #ESKZ indicates usage by IBM i.

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 Power10 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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESKZ) - 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No Longer Available as of May 12, 2023)

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

Features #ESKX and #ESKZ are physically identical drives with the same 5B2F CCIN. Different feature codes help the IBM configuration tools understand how the SSD is used. #ESKX indicates usage by AIX, Linux or VIOS. #ESKZ indicates usage by IBM i.

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 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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESLA) - Specify AC Power Supply for EXP24SX Storage Enclosure

(No longer available as of August 12, 2024)

No-charge specify for AC power supply for an 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: EXP24SX Storage Enclosure and AC power cord
- Minimum required: 0
- Maximum allowed: 28 (Initial order maximum: 28)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESLB) - ESBB Load Source Specify (387GB SSD SFF-2)

This specify code indicates that a #ESBB Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESBB
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ESBB
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESLH) - ESBH Load Source Specify (775GB SSD SFF-2)

This specify code indicates that a #ESBH Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESBH
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ESBH
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESLM) - ESBM Load Source Specify (1.55TB SSD SFF-2)

This specify code indicates that a #ESBM Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESBM
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature ESBM
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes

- Return parts MES: No

(#ESLS) - EXP24SX SAS Storage Enclosure

(No Longer Available as of October 20, 2023)

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 specifically documented procedure. **IMPORTANT NOTE:** when changing mode, it is very important that you follow the documented procedures and that there is no data on the drives before the change. Improperly changing modes can potentially destroy existing RAID sets, prevent access to existing data, or allow other partitions to access another partition's existing data. Hire an expert to assist if you are not familiar with this type of re-configuration work.

The 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 Y012 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: 28 (Initial order maximum: 28)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

 **Note:** Assignment to the VIOS supported

(#ESLV) - Load Source Specify for EC6V (NVMe 1.6 TB SSD for IBM i)

(No Longer Available as of August 11, 2023)

This specify code indicates that a #EC6V is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENS1 and #ENS2 are used with this specify code.

- Attributes provided: None
- Attributes required: Feature EC6V
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature EC6V
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESLX) - Load Source Specify for EC6X (NVMe 3.2 TB SSD for IBM i)

(No Longer Available as of August 11, 2023)

This specify code indicates that a #EC6X is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENS1 and #ENS2 are used with this specify code.

- Attributes provided: None
- Attributes required: Feature EC6X
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature EC6X
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESLZ) - Load Source Specify for EC6Z (NVMe 6.4 TB SSD for IBM i)

(No Longer Available as of August 11, 2023)

This specify code indicates that a #EC6Z is being used as the Load Source. The IBM i NVMe Load Source Name Space specify codes #ENS1 and #ENS2 are used with this specify code.

- Attributes provided: None
- Attributes required: Feature EC6Z
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: see feature EC6Z
- Initial Order/MES/Both/Supported: Supported

- CSU: Yes
- Return parts MES: No

(#ESMB) - 931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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
7.44 TB	13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a Power9 or Power10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESMD) - 931GB Mainstream SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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

7.44 TB 13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER9 or POWER10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter or later.
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESMF) - 1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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

7.44 TB 13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a Power9 or Power10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESMH) - 1.86TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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
7.44 TB	13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER9 or POWER10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESMK) - 3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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

7.44 TB 13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a Power9 or Power10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESMS) - 3.72TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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
7.44 TB 13601

Limitation:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER9 or POWER10 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-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESMV) - 7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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

Limitations:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a Power9 or Power10 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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0

- Maximum allowed: 336 (Initial order maximum: 250)
- 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

(#ESMX) - 7.44TB Mainstream SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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

Limitations:

- The drive is mounted on a SFF-2 carrier/tray and does not physically fit into a POWER9 or POWER10 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: 7.44 TB Mainstream SSD
- Attributes required: Open SFF-2 SAS bay controlled by PCIe Gen3 PCIe SAS adapter, or later
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i 7.5, or later
 - IBM i 7.4 TR6, or later
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNA) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

This SFF (2.5") Enterprise SAS Solid State Drive (SSD) is shipped from IBM with 775 GB capacity formatted with 4k (4224) byte sectors. The drive is supported in SFF-2 SAS bays in the EXP24S (#5887) or EXP24SX (#ESLS) I/O drawer. This drive is rated at 10 DWPD (Drive Writes Per Day) calculated over a 5-year period.

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 #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 Power9/Power10 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESNB) - 775GB Enterprise SAS 4k SFF-2 SSD for IBM i

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.

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 #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 cannot be reformatted to 5xx drives (or vice versa).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESNE) - 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 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.

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 #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 Power9/Power10 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).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - AIX supported
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESNF) - 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i

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.

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 #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 cannot be reformatted to 5xx drives (or vice versa).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 0)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#ESNL) - 283GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)

(No longer available as of January 12, 2024)

283 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 4224 byte sectors. If reformatted to 4096 byte sectors, capacity would be 300 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: 283 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNM) - 300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)

(No longer available as of January 12, 2024)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B43.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 300 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESNQ) - 571GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (IBM i)

(No longer available as of January 12, 2024)

571 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 4224 byte sectors. If reformatted to 4096 byte sectors,

capacity would be 600 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: 571 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ESNR) - 600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)

(No longer available as of January 12, 2024)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B47.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 600 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESRM) - 300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)

300 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 283 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B43.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 300 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 0)
- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ESRR) - 600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (Linux)

600 GB 2.5-inch (Small Form Factor (SFF)) 15k rpm SAS disk drive on Gen-2 carrier/tray. Supported in SFF-2 SAS bays. Disk is formatted for 4096 byte sectors. If reformatted to 4224 byte sectors, capacity would be 571 GB. Drive includes enhanced caching capability with 256MB DRAM which may improve performance somewhat compared to previous disk drives without the cache.

CCIN is 5B47.

Limitations:

- Cannot be combined in the same array as a drive of the same capacity, but using different sector size. However, can be combined with non-cached drives of same capacity in the same array.
- This HDD feature is not supported in the EXP24S drawer (#5887 or #EL1S).
- Attributes provided: 600 GB Disk Drive - SFF-2
- Attributes required: one SFF-2 drive bay
- Minimum required: 0
- Maximum allowed: 672 (Initial order maximum: 0)

- OS level required:
 - Linux supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#ESWK) - AIX Update Access Key (UAK)

With the introduction of the Power10 server, IBM expands upon the use of the update access key (UAK) with the addition of an AIX Software Maintenance (SWMA) UAK. This functionality provides proactive notification of AIX SWMA expirations to ensure continued and uninterrupted software support. AIX SWMA UAKs do not limit the operability of or capability to update AIX. For additional information see announcement letters:

- For Japan: JP21-0387
- For Asia Pacific: AP21-0322
- For United States: 221-331
- For Latin America: LP21-0395
- For Canada: A21-050
- For Europe Middle East and Africa: ZP21-0403
- Attributes provided: AIX software maintenance agreements (SWMA) validation
- Attributes required: AIX OS on server
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - AIX supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: No

(#ETK1) - 387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETK1 CCIN is 5B16. Different feature codes to help the IBM configuration tools understand how the SSD is used. ETK1 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 Power9 or Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 5xx SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

#ETK3) - 775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETK3 CCIN is 5B17. Different feature codes to help the IBM configuration tools understand how the SSD is used. Feature ETK3 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 Power9 or Power10 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).

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.

- Attributes provided: one 775 GB SFF-2 5xx SSD
- Attributes required: SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ETK8) - 387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETK8 and #ETK9 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 ETK8 indicates usage by AIX, Linux or VIOS. Feature ETK9 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 Power9 or Power10 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).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ETK9) - 387GB Enterprise SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETK8 and #ETK9 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 ETK8 indicates usage by AIX, Linux or VIOS. Feature ETK9 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 POWER9 or POWER10 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).

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.

- Attributes provided: one 387 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ETKC) - 775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETKC and #ETKD 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 ETKC

indicates usage by AIX, Linux or VIOS. Feature ETKD 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 Power9 or Power10 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ETKD) - 775GB Enterprise SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETKC and #ETKD 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 ETKC indicates usage by AIX, Linux or VIOS. Feature ETKD 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 POWER9 or POWER10 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).

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.

- Attributes provided: one 775 GB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#ETKG) - 1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETKG and #ETKH 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 ETKG

indicates usage by AIX, Linux or VIOS. Feature ETKH 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 Power9 or Power10 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).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#ETKH) - 1.55TB Enterprise SAS 4k SFF-2 SSD for IBM i

(No longer available as of January 12, 2024)

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 SSD device failures will be replaced during 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. Individual service life may vary and can be monitored using an operating system command.

Features #ETKG and #ETKH 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 ETKG indicates usage by AIX, Linux or VIOS. Feature ETKH 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 POWER9 or POWER10 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).

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.

- Attributes provided: one 1.55 TB SFF-2 4k SSD
- Attributes required: one SFF-2 SAS bay, PCIe3 SAS controller
- Minimum required: 0
- Maximum allowed: 336 (Initial order maximum: 250)
- OS level required:
 - IBM i supported
 - Linux not supported
- 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:
 - Linux supported
 - AIX supported
 - IBM i supported

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

i 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: 0)
- OS level required:
 - Linux supported
 - IBM i supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

i Note: Assignment to the VIOS supported

(#EU0K) - Operator Panel LCD Display

This feature provides a cable that connects the system's Operator Panel to the Storage backplane. Used on a Rack-mount drawer.

- Attributes provided: LCD display
- 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

(#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: 0)
- OS level required:
 - Linux supported
 - IBM i supported
 - AIX supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EU19) - Cable Ties & Labels

Set of 10 hook and loop fabric, often called VELCRO(R) ties 35.5 cm (14-inch) in length to conveniently attach cables or cords to rack or other cables. Set of 16 labels 2x4 inches (5x10 cm) in size to identify cables when installing or moving or servicing equipment.

- 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

(#EU29) - Order Placed Indicator

This feature is used to identify ORDER PLACED for administrative purposes within manufacturing to facilitate processing.

- Attributes provided: ORDER PLACED INDICATOR FOR ADMINISTRATIVE TRACKING
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 1)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EU2C) - Express Edition 4 core (IBM i)

Specify Express Edition 4-core (IBM i) to invoke configuration feature defaults.

- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Initial
- CSU: N/A
- Return parts MES: Does not apply

(#EU2T) - 2TB Removable Disk Drive Cartridge (RDX)

The 2.0TB Removable Disk Drive Cartridge provides a RDX disk drive in a rugged cartridge to be used in an RDX Internal and External Docking Station such as (#1103, #1104 or #1123, #EU03, #EU04, #EU23, or #EU07. 2.0TB is uncompressed. Compression/ decompression is provided by the operating system, not the drive itself. Feature EU2T is not entitled under the IBM Maintenance Agreement, if one is purchased.

- Attributes provided: 2.0TB RDX rugged disk cartridge
- Attributes required: None.
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EU41) - ESJ1 Load Source Specify (931GB SSD SFF-2)

This specify code indicates that a #ESJ1 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJ1
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJ1
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes

- Return parts MES: No

(#EU43) - ESJ3 Load Source Specify (1.86TB SSD SFF-2)

This specify code indicates that a #ESJ3 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJ3
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJ3
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EU45) - ESJ5 Load Source Specify (3.72TB SSD SFF-2)

This specify code indicates that a #ESJ5 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJ5
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJ5
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EU47) - ESJ7 Load Source Specify (7.45TB SSD SFF-2)

This specify code indicates that a #ESJ7 Solid State Drive is being used as the Load Source.

- Attributes provided: Communicate location of load source to IBM Manufacturing
- Attributes required: Feature ESJ7
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 0)
- OS level required: See feature ESJ7
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No

(#EUA0) - RDX USB Internal Docking Station

USB Internal Docking Station which accommodates RDX removable disk cartridge of any capacity. The disk is 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 can be used similar to a tape drive. This can be an excellent entry

system save/ restore option and a good alternative to DAT72, DAT160, 8mm, and VXA-2 and VXA-320 tapes.

#EUA0 can be installed into a Power server via a USB cable which carries data and control information. It is not powered by the USB port on the Power System or Power System USB adapter, but has a separate electrical line cord.

- Attributes provided: USB RDX Internal Docking Station with Power cord
- Attributes required: One USB port on server
- Minimum required: 0
- Maximum allowed: 1 (Initial order maximum: 1)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#EUA4) - RDX USB External Docking Station

USB External Docking Station which accommodates RDX removable disk cartridge of any capacity. The disk is 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 can be used similar to a tape drive. This can be an excellent entry system save/ restore option and a good alternative to DAT72, DAT160, 8mm, and VXA-2 and VXA-320 tapes. CCIN: 63B8-005.

#EUA4 attaches to a Power server via a USB cable which carries data and control information. It is not powered by the USB port on the Power System or Power System USB adapter, but has a separate electrical line cord. Physically the #EUA4 docking station is a standalone enclosure about 2.0 x 7.0 x 4.25 inches in size which can sit on a shelf or on top of equipment in a rack.

#EUA4 is a follow on product to the #EU04 RDX docking station. #EUA4 has identical performance and identical application function to:

- Previously announced #EU04 and #1104 USB external docking stations
- Top mount #EUA3 USB docking station used in the Power S814 tower configuration
- #EU03 USB internal docking stations used in Power 720 system units
- #EU03 USB docking station available in the rack mounted IBM 7226-1U3 Multimedia Drawer



Note: Feature EUA4 is not orderable in the following countries: China, Taiwan, Australia, India, New Zealand, Japan, Armenia, Tajikistan, Turkmenistan, Uzbekistan, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Russia, South Africa, and Mexico.

- Attributes provided:
 - USB 3.0 RDX External Docking Station
 - USB 3.0 Cable (2.7 meter or 8.8 foot)
 - Four line cords (1.85 meter or 6 foot) with type A, G, F or I plug (see <http://www.iec.ch/worldplugs> for type definition and country- specific usage)
 - One power jumper cord as an alternative to using one of the four power line cords above. This would draw power from a PDU in a rack.
 - Power Adapter using single phase 110-250V 50-60Hz power source
- Attributes required: One USB port on server or server's USB adapter
- Minimum required: 0
- Maximum allowed: 5 (Initial order maximum: 0)
- OS level required:
 - Linux supported
 - AIX supported
 - IBM i supported
- Initial Order/MES/Both/Supported: Supported
- CSU: Yes
- Return parts MES: No



Note: Assignment to the VIOS supported

(#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, 9223-42H, and 9043-MRX 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:
 - Linux supported
 - AIX supported

- IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No
 - If using #EUA5 on this system's integrated USB 3.0 ports, it must be connected to the front USB 3.0 port. #EUA5 is not supported on the rear USB 3.0 ports.
 - Assignment to the VIOS supported

(#EVSN) - Enable Virtual Serial Number

This feature provides the ability to order a set of Virtual Serial Numbers.

The order is placed and fulfilled on the Entitled System Support (ESS) web site. A customer can go to ESS and request their set of Virtual Serial Numbers on the machine. At the end of the ordering and ESS retrieval steps, the customer will have an array of Virtual Serial Numbers available to start using, example: assigning to partitions, on their machine.

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 999 (Initial order maximum: 999)
- OS level required:
 - IBM i supported
- Initial Order/MES/Both/Supported: Both
- CSU: Yes
- Return parts MES: No

(#EX23) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 48 hr committed fix

- 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

(#EX24) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 48 hr committed fix

- 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

(#EX25) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 48HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 48 hr committed fix

- 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

(#EX33) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 72 hr committed fix

- 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

(#EX34) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 72 hr committed fix

- 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

(#EX35) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 72HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 72 hr committed fix

- 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

(#EX43) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 48 hr committed fix

- 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

(#EX44) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 48 hr committed fix

- 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

(#EX45) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 48HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 48 hr committed fix

- 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

(#EX53) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 72 hr committed fix

- 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

(#EX54) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 72 hr committed fix

- 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

(#EX55) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 72HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 72 hr committed fix

- 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

(#EX63) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 6 hr committed fix

- 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

(#EX64) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 6 hr committed fix

- 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

(#EX65) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 6HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 6 hr committed fix

- 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

(#EX73) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 6 hr committed fix

- 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

(#EX74) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 6 hr committed fix

- 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

(#EX75) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 6HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 6 hr committed fix

- 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

(#EX83) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 8 hr committed fix

- 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

(#EX84) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 8 hr committed fix

- 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

(#EX85) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 8HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 8 hr committed fix

- 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

(#EX93) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 8 hr committed fix

- 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

(#EX94) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 8 hr committed fix

- 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

(#EX95) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 8HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 8 hr committed fix

- 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

(#EXA3) - 3 YEAR, ADVANCED EXPERT CARE

This feature indicates IBM Power Expert Care Advanced 3 years

- 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

(#EXA4) - 4 YEAR, ADVANCED EXPERT CARE

This feature indicates the IBM Power Expert Care Advanced 4 year

- 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

(#EXA5) - 5 YEAR, ADVANCED EXPERT CARE

This feature indicates IBM Power Expert Care Advanced 5 years

- 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

(#EXB3) - IBM Power Expert Care Basic 3 Year

- 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

(#EXB4) - IBM Power Expert Care Basic 4 Year

- 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

(#EXB5) - IBM Power Expert Care Basic 5 Year

- 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

(#EXF3) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 24 hr committed fix

- 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

(#EXF4) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 24 hr committed fix

- 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

(#EXF5) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 24HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 24 hr committed fix

- 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

(#EXG3) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 24 hr committed fix

- 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

(#EXG4) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 24 hr committed fix

- 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

(#EXG5) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 24HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 24 hr committed fix

- 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

(#EXH3) - 3 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 3 years 12 hr committed fix

- 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

(#EXH4) - 4 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Advanced 4 year, 12 hr committed fix

- 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

(#EXH5) - 5 YEAR, IBM POWER EXPERT CARE ADVANCED, 12HR COMMITTED FIX

This feature indicates IBM Power Expert Care Advanced 5 years 12 hr committed fix

- 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

(#EXJ3) - 3 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 3 years 12 hr committed fix

- 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

(#EXJ4) - 4 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR COMMITTED FIX

This feature indicates the IBM Power Expert Care Premium 4 year, 12 hr committed fix

- 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

(#EXJ5) - 5 YEAR, IBM POWER EXPERT CARE PREMIUM, 12HR COMMITTED FIX

This feature indicates IBM Power Expert Care Premium 5 years 12 hr committed fix

- 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

(#EXP3) - 3 YEAR, PREMIUM EXPERT CARE

This feature indicates IBM Power Expert Care Premium 3 years

- 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

(#EXP4) - 4 YEAR, PREMIUM EXPERT CARE

This feature indicates the IBM Power Expert Care Premium 4 year

- 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

(#EXP5) - 5 YEAR, PREMIUM EXPERT CARE

This feature indicates IBM Power Expert Care Premium 5 years

- 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

(#SVBP) - BP Post-Sale Services

1 Day

BP Post-Sale Services: 1 Day

- Attributes provided: None
- Attributes required: None
- Minimum required: 0
- Maximum allowed: 9999 (Initial order maximum: 250)
- OS level required: None
- Initial Order/MES/Both/Supported: Both
- CSU: Yes

- Return parts MES: No

(#SVCS) - IBM Systems Lab Services Post-Sale Services

1 Day

IBM Systems Lab Services Post-Sale Services: 1 Day

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

(#SVNN) - Other IBM Post-Sale Services

1 Day

Other IBM Post-Sale Services: 1 Day

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

Feature exchanges

Not applicable.

Accessories

None.

Customer replacement parts

None.

Supplies

None.

Supplemental media

None.

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