

IBM Power System S922 server is enhanced to provide a superior on-premises infrastructure for hybrid multicloud platforms, delivering high security and reliability, industry-leading PCIe Gen4 IO, and a built-in cloud-optimized hypervisor

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At a glance

The refreshed IBM^(R) Power^(R) System S922 (9009-22G) server easily integrates into your organization's cloud and cognitive strategy and delivers industry-leading price and performance for your mission-critical workloads.

- Gain faster insights from your data with up to 4 TB of in-memory database capabilities for SAP HANA, IBM Db2^(R), Oracle, and a variety of open-source databases.
- Deliver superior price and performance for your mission-critical applications with room to scale in IBM AIX^(R), IBM i, and Linux^(R) environments.
- Prevent security threats with advanced security features combined with unmatched reliability and resiliency.
- Harness the integrated virtualization capabilities of the server to rapidly deploy, optimize, and recover workloads.
- Migrate from previous IBM Power Systems servers with Live Partition Mobility (LPM) capabilities. Every new Power S922 server comes with a temporary IBM PowerVM^(R) license for your old server to support a seamless move to IBM POWER9TM technology-based servers.
- Use this cloud-enabled server to build an agile, containerized cloud on a server platform that is optimized for data and cognitive services.
- Extend IBM i, the integrated operating system, and connect to the cognitive capabilities of the IBM Cloud^(R) using secure APIs.
- Twice more bandwidth for a seamless integration between on-premises and public clouds with a new back-end PCIe Gen4 switch.
- Introducing Shared Utility Capacity for pay-per-use computing and multisystem resource sharing through IBM Power Enterprise Pools 2.0.
- More NVMe adapters with ten PCIe Gen4 slots in the back plus four PCI Gen4-capable U.2 front-accessible drives.
- Up to 89.6 TB of NVMe Enterprise Class Storage capacity.
- New feature code enables a low-cost POWER9 server with one processor core activated for IBM i.
- New cost-effective 800 GB data center PCIe Gen3 NVMe device supported for AIX, IBM VIOS, or Linux environments.
- Boot from PCIe Gen4 NVMe devices supported for native IBM i deployments.

Overview

Power Systems has always been focused on reliability and performance. The Power System S922 server is primed with POWER9 processor, displaying a technology designed from the ground up for data-intensive workloads such as operational databases, advanced analytics, and business applications. The system is built with innovations that deliver the highest security and reliability standards for future-driven enterprises.

When it comes to virtualization technology, Power Systems are unmatched. With a built-in PowerVM hypervisor, clients have been relying on IBM for years to provide consumability and agility in IT data centers. Today, leveraging IBM's unique, comprehensive approach to the cloud, from on-premises IT to public cloud provider, we are taking one step forward.

The new Power System S922, powered by PCIe Gen4 switches, delivers a seamless and lightspeed throughput I/O between multiple on-premises and public clouds applications, as well as cloud-like agility and economics by supporting Enterprise Pools 2.0.

The Power S922 (9009-22G) server has been refreshed to provide:

A superior on-premises infrastructure for hybrid cloud

- Twice as fast back-end I/O enables seamless maximum speed and throughput between on-premises and multiple public cloud infrastructures with high availability.
- Largest memory bandwidth and memory storage in the market together with up to 14 (four U.2 NVMe plus up to ten PCIe add in cards) NVMe adapters allow a huge VM, container, and bare metal consolidation, saving data center space and networking costs.
- Supports multiple OS instances without processing overhead in the server.
- PowerVM hypervisor is built in at no extra charge, so every POWER9 workload is virtualized, mobile, and cloud ready.
- IBM VM Recovery Manager, built on PowerVM, provides easy, low-cost solutions for high availability (HA) and disaster recovery (DR) operations.
- IBM PowerHA[®] for AIX and IBM i are the low-cost, highly automated solutions to deliver high availability features to your mission critical applications.

Introducing Shared Utility Capacity for pay-per-use compute experience by the minute

- Flexible consumption with pay-per-use computing through Power Enterprise Pools 2.0. No fixed monthly fees: you pay for what you use.
- Enables multisystems resource sharing across a collection of IBM scale-out servers - pool processors, AIX, and IBM i license entitlements.
- Lower initial system price with a higher value-added proposition. Systems may be configured with only a single core active and 256 GB memory.
- Delivers an on-premises cloud-like agility and economics experience with leadership business continuity and security hardware.
- Industry-leading monitoring and metering through an IBM Cloud Management Console (CMC) with granular real-time and historical views of consumption by resource by LPAR and system.

Increased performance and flexibility for your key workloads

- Upgrade AIX and IBM i installations to speed up your journey to a hybrid multicloud
- Benefit from an increased I/O architecture on Db2 Mirror for i
- Optimize performance and license costs with Oracle applications through Shared Utility Capacity

- Red Hat^(R) Enterprise Linux and Red Hat OpenShift^(R) deployments
- Increased performance and reduced footprint to run IBM Cloud Paks
- Power S922 Epic Healthcare Solution Edition
- High performance for IBM Spectrum^(R) Scale offerings
- SAP HANA environments with external storage and multiple nodes

Tailored POWER9 server for IBM i clients

Introducing a cost-effective POWER9-based server with a new 1-core processor option for the Power S922 server. This new 1S/2U POWER9 offering, shipping with 1-socket only populated and one-core only activated, runs IBM i natively with no need for VIOS. It delivers twice more performance than its predecessor for clients running IBM i (up to 25 users) and uses a typical 2.8 to 3.8 GHz (max) POWER9 processor card (#EP5Y) with processor core activation feature (#EP6Y). The processor core must be activated.

Key features

The Power System S922 server is a robust 2-socket system that meets today's growth and tomorrow's processing needs. It ships with up to 22 powerful cores and I/O configuration flexibility in a 19-inch rackmount, 2U (EIA units) form factor. The server supports:

- One processor socket populated with the following POWER9 processor modules:
 - 1-core typical 2.8 to 3.8 GHz (max)
 - 4-core typical 2.8 to 3.8 GHz (max)
- One or two processor sockets populated with the following POWER9 processor modules:
 - 11-core typical 2.8 to 3.8 GHz (max)
 - 10-core typical 2.9 to 3.8 GHz (max)
 - 8-core typical 3.4 to 3.9 GHz (max)

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

- Up to 4.0 TB of system memory distributed across 32 DDR4 DIMM slots. Supports different memory DIMMs sizes, such as 16 GB, 32 GB, 64 GB, and 128 GB, running at different speeds of 2133, 2400, and 2666 Mbps.
- Multiple I/O options:
 - Three x16 Gen4 low-profile, half-length slots (CAPI)
 - Two x16 Gen4 low-profile, half-length slots
 - One x8 Gen4 low-profile, half-length slots (with x16 connectors) (CAPI)
 - One x8 Gen4 low-profile, half-length slots (with x16 connectors)
 - Four x8 Gen4 low-profile, half-length slots (One of these slots is used for the required base LAN adapter.)
- Storage features:
 - Storage backplane with two or four front PCIe Gen4 capable NVMe U.2 drive slots
 - Eight 2.5-inch SFF-3 (Gen3 carrier) disk bays
 - Base 8 SFF-3 bays
 - RAID 0, 5, 6, 10, 5T2, 6T2, and 10T2 support

- Split feature to 4+4 SFF bays: Add a second SAS controller
- Expanded function 8 SFF-3 bays/dual IOA with write cache and optional external SAS port
- Expansion capabilities for the EXP12SX/EXP24SX SFF Gen2-bay drawer
- Hot-plug PCIe Gen4 capable U.2 slots
- Integrated technologies and features:
 - Service processor
 - EnergyScale
 - Hot-plug and redundant cooling
 - Two front and two rear USB 3.0 ports
 - Two HMC ports
 - One system port with RJ45 connector
- 1+1 redundant hot-plug AC power supplies in each enclosure
- PowerVM integrated virtualization with minimum processing overhead

Feature exchange

Not applicable

Key requirements

An IBM i, or AIX, or Linux operating system. See the [Software requirements](#) section for details.

Planned availability date

- July 24, 2020, except for features EHM0 and EM67
- August 14, 2020, for features EHM0 and EM67

Description

The POWER9 scale-out family is the first set of servers that comes completely cloud enabled out of the box with integrated PowerVM Enterprise capabilities. These servers have a native hypervisor included at no additional license cost. Additionally, on-chip analytics and algorithms combined with a sophisticated PCIe Gen4 I/O architecture help clients run their workloads at an optimized processor frequency for performance and throughput. In combination with the DDR4 memory footprint of 4 TB, IBM provides a system that is unmatched by the competition in terms of memory scaling as well as the core-to-memory ratio needed for data-centric and in-memory workloads. LPM capabilities help you migrate from previous Power Systems. Every new Power S922 has the option of a temporary PowerVM license for your old server to support a seamless move of workloads to POWER9. The Power System S922 server has built-in security that can help you to be ready for current and future security threats.

Summary of standard features for the Power S922 server:

- POWER9 processor modules:
 - 1-core typical 2.8 to 3.8 GHz (max) POWER9 processor (#EP5Y)
 - 4-core typical 2.8 to 3.8 GHz (max) POWER9 processor (#EP56)
 - 8-core typical 3.4 to 3.9 GHz (max) POWER9 processor (#EP58)

- 10-core typical 2.9 to 3.8 GHz (max) POWER9 processor (#EP59)
- 11-core typical 2.8 to 3.8 GHz (max) POWER9 processor (#EP5B)
- High-performance Mbps DDR4 ECC memory
 - 16 GB (#EM62), 32 GB (#EM63), 64 GB (#EM64), or 128 GB (#EM65) memory features - different sizes and configurations run at different frequencies of 2133, 2400, and 2666 Mbps
 - Up to 4 TB of DDR4 memory with two Power Systems processors
 - Up to 2 TB of DDR4 memory with one Power Systems processor
- Storage features:
 - Storage backplane with two or four front PCIe Gen4 capable NVMe U.2 drive slots
 - Eight SFF bays, one integrated SAS controller without cache, and JBOD RAID 0, RAID 5, RAID 6, or RAID 10
 - Option to split the above SFF-3 bays and add a second integrated SAS controller without cache
 - Expanded function storage backplane 8 SFF-3 bays/single IOA with write cache
 - Option to attach an EXP12SX/EXP24SX SAS HDD/SSD expansion drawer to the single IOA
- PCIe slots with single processor:
 - One x16 Gen4 low-profile, half-length slot (CAPI)
 - One x8 Gen4 low-profile, half-length slot (with x16 connector) (CAPI)
 - Two x16 Gen4 low-profile, half-length slots
 - Four x8 Gen4 low-profile, half-length slots (One of these slots is used for the required base LAN adapter.)
- PCIe slots with two processors:
 - Three x16 Gen4 low-profile, half-length slots (CAPI)
 - One x8 Gen4 low-profile, half-length slots (with x16 connectors) (CAPI)
 - One x8 Gen4 low-profile, half-length slots (with x16 connectors)
 - Two x16 Gen4 low-profile, half-length slots
 - Four x8 Gen4 low-profile, half-length slots (One of these slots is used for the required base LAN adapter.)
- Integrated:
 - Service processor
 - EnergyScale technology
 - Hot-plug and redundant cooling
 - Two front USB 3.0 ports
 - Two rear USB 3.0 ports
 - Two HMC 1 GbE RJ45 ports
 - One system port with RJ45 connector
 - Two hot-plug, redundant power supplies
 - Nineteen-inch rack-mounting hardware (2U)

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.

Power S922 (9009-22G) Capacity Backup (CBU) for IBM i

The Power S922 (9009-22G) CBU designation enables you to temporarily transfer IBM i processor license entitlements and IBM i user license entitlements purchased

for a primary machine to a secondary CBU-designated system for HA and 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, disaster recovery, and high availability scenarios. Temporary entitlement transfer means that the entitlement is a property transferred from the primary system to the CBU system and may remain in use on the CBU system as long as the registered primary and CBU system are in deployment for the high availability or disaster recovery operation. The intent of the CBU offering is to enable regular role-swap operations.

The primary systems for a Power S922 (9009-22G) CBU server with its IBM i P10 software tier can be a POWER9 or POWER8[®] server with a P10 or P20 software tier listed below:

- Power S824 (8286-42A)
- Power S814 6-core or 8-core (8286-41A)
- Power S822 (8284-22A)
- Power S924 (9009-42A)
- Power S924 (9009-42G)
- Power S914 6-core or 8-core (9009-41A)
- Power S914 6-core or 8-core (9009-41G)
- Power S922 (9009-22A)
- Power S922 (9009-22G)

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

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

Before you can temporarily transfer IBM i user entitlements, you must have more than the minimum number of IBM i user entitlements on a primary server. You can then transfer any IBM i user entitlements above the minimum, assuming the total IBM i users on the primary system do not require the IBM i entitlement you want to transfer during the time of the transfer. The Power S824 and Power S924 servers do not have user entitlements that can be transferred, and only processor

license entitlements can be transferred. The minimum number of IBM i users on the POWER9 and POWER8 with IBM i user entitlements are:

- Power S814 6-core or 8-core (8286-41A): 10 users
- Power S822 (8284-22A): 10 users
- Power S914 6-core or 8-core (9009-41A): 10 users
- Power S914 6-core or 8-core (9009-41G): 10 users
- Power S922 (9009-22A): 10 users
- Power S922 (9009-22G): 10 users

For example, if you have a 2-core server as your primary system with two IBM i processor license entitlements (one above the minimum) and 50 IBM i user entitlements (20 above the minimum), you can temporarily transfer up to one IBM i entitlement and up to 20 user entitlements. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor and user license entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system.

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

Power S922 and IBM i

IBM i support is provided at a price-attractive P10 software tier even though the Power S922 has two sockets. For the 8-core, 10-core, and 11-core processors features #EP58, #EP59, and #EP5B there are limitations to the maximum size of the partition, and all I/O must be virtualized through VIOS. Up to four cores (real or virtual) per IBM i partition are supported. Multiple IBM i partitions can be created and run concurrently, and each individual partition can have up to four cores.

For the 1-core processor feature #EP5Y, IBM i runs natively and VIOS is not supported. IBM i SW tier for #EP5Y is P05.

IBM i QPRCFEAT values are the same numeric value as the processor feature code. IBM i does not support the 4-core processor feature EP56.

- The 1-core processor (#EP5Y, QPRCFEAT EP5Y) is IBM i SW tier P05.
- The 8-core processor (#EP58, QPRCFEAT EP58) is IBM i SW tier P10.
- The 10-core processor (#EP59, QPRCFEAT EP59) is IBM i SW tier P10.
- The 11-core processor (#EP5B, QPRCFEAT EP5B) is IBM i SW tier P10.

One-core Power S922 processor configuration

The 1-core Power S922 server offers clients running IBM i (up to 25 users) an entry server based on POWER9 technology. It uses a typical 2.8 to 3.8 GHz (max) POWER9 processor card (#EP5Y) with processor core activation feature (#EP6Y). The processor core must be activated.

There is no upgrade to increase the cores on this feature. This server supports IBM i clients with its P05 software tier, VIOS is not supported, IBM i Express^(R) Edition (EU2E) not allowed. The Capacity Backup option for IBM i (#0444) is supported. The 1-core Power S922 server configuration supports a maximum system memory of 64 GB and a minimum system memory is 32 GB. The 1-core Power S922 server supports a maximum of eight SAS drives or maximum of two NVMe PCIe adapters. The PCIe expansion drawer (#EMX0) and EXP24SX /EXP12SX SAS storage enclosures (#ESLS or #ESLL) do not apply to the 1-core configuration Power S922 server.

SAS drives located in feature code I/O drawers such as the EXP24SX (#ESLS) are not supported. Attachment to SANs is supported. The following I/O adapters,

storage backplane options, two NVMe PCIe adapters, and SFF-3 SAS drives are supported in the SAS/NVMe bays of the 1-core Power S922 system unit:

I/O adapters

- (#5260) - PCIe2 LP 4-port 1GbE adapter
- (#5273) - PCIe LP 8Gb 2-Port Fibre Channel adapter - supported only
- (#EC45) - PCIe2 LP 4-Port USB 3.0 adapter
- (#EJ11) - PCIe3 LP SAS Tape/DVD adapter Quad-port 6Gb x8
- (#EJ1N) - PCIe1 LP SAS Tape/DVD Dual-port 3Gb x8 adapter
- (#EN0B) - PCIe3 LP 16Gb 2-port Fibre Channel adapter

Storage backplane options

- (#EJ1F) - Base storage backplane 8 SFF-3 bays
- (#EJ1H) - Split #EJ1F to 4+4 SFF-3 bays: Add second SAS controller
- (#EJ1V) - Storage backplane with 2 PCIe Gen4 capable NVMe U.2 drive slots
- (#EJ1W) - Storage backplane with 4 PCIe Gen4 capable NVMe U.2 drive slots
- (#EJ1Q) - NVMe U.2 Pass-Thru adapter Gen4 capable

External docking station options

- (#EUA5) - Standalone USB DVD drive w/cable
- (#1107) - USB 500 GB Removable Disk Drive
- (#EU01) - 1TB Removable Disk Drive Cartridge
- (#EU04) - RDX USB External Docking Station for Removable Disk Cartridge
- (#EU08) - RDX 320 GB Removable Disk Drive
- (#EU15) - 1.5TB Removable Disk Drive Cartridge
- (#EU2T) - 2TB Removable Disk Drive Cartridge (RDX)
- (#EUA4) - RDX USB External Docking Station

15k rpm disk drives

- (#ESNJ) - 283GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (IBM i)

NVMe PCIe cards

- (#ES1F) - 1.6 TB Enterprise 4K NVMe SFF U.2 15mm SSD PCIe4 for IBM i

Other SFF-3 drives are not supported. The 1-core Power S922 server has eight PCIe Gen4 slots. One slot is used by one 4-port 1 Gb Ethernet adapter.

The CBU specify feature (#0444) is supported with the 1-core processor card (#EP5Y) in IBM i environments. With its P05 software, it can be paired with a POWER8 or POWER9 server with P05 or P10 software tier.

Processor modules

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

- One 1-core, typical 2.8 to 3.8 GHz (max) processor (#EP5Y) requires that one processor activation code be ordered. A maximum of one processor activation (#EP6Y) is allowed.
- One 4-core, typical 2.8 to 3.8 GHz (max) processor (#EP56) requires that four processor activation codes be ordered. A maximum of four processor activations (#EP66) is allowed.

A maximum of two processors of the same type is allowed. The following defines the allowed quantities of processor activation entitlements:

- One 8-core, typical 3.4 to 3.9 GHz (max) processor (#EP58) requires that eight processor activation codes be ordered. A maximum of eight processor activations (#EP68) is allowed.
- Two 8-core, typical 3.4 to 3.9 GHz (max) processors (#EP58) require that sixteen processor activation codes be ordered. A maximum of 16 processor activations (#EP68) is allowed.
- One 10-core, typical 2.9 to 3.8 GHz (max) processor (#EP59) requires that ten processor activation codes be ordered. A maximum of 10 processor activation features (#EP69) is allowed.
- Two 10-core, typical 2.9 to 3.8 GHz (max) processors (#EP59) require that twenty processor activation codes be ordered. A maximum of 20 processor activation features (#EP69) is allowed.
- One 11-core, typical 2.8 to 3.8 GHz (max) processor (#EP5B) requires that ten processor activation codes be ordered. A maximum of 11 processor activation features (#EP6B) is allowed.
- Two 11-core, typical 2.8 to 3.8 GHz (max) processors (#EP5B) require that twenty processor activation codes be ordered. A maximum of 22 processor activation features (#EP6B) is allowed.

System memory

- A minimum of 32 GB of memory is required on the Power S922 system.
- Memory upgrades require memory pairs. Base memory is 2x 16 GB DIMMs (#EM62) with one socket installed and 4x16 GB DIMMs (#EM62) with two sockets installed (2 per socket).

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.

Feature description	Feature number	Minimum DIMM quantity	Maximum DIMM quantity
16 GB DDR4 Memory	EM62	0	32
32 GB DDR4 Memory	EM63	0	32
64 GB DDR4 Memory	EM64	0	32
128 GB DDR4 Memory	EM65	0	32

Note: Different sizes and configurations run at different frequencies of 2133, 2400, and 2666 Mbps.

Power supply

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

Redundant fans

Redundant fans are standard.

Power cords

Two power cords are required. The Power S922 server supports power cord 4.3 m (14 ft), Drawer to Wall/IBM PDU (250V/10A) in the base shipment group. See the feature listing for other options.

PCIe slots

The Power S922 server has up to 14 (four U.2 NVMe plus up to ten PCIe add in cards) PCIe hot-plug slots, 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 two POWER9 processor single-chip modules (SCM), eleven PCIe slots are available, three are x16 Gen4 low-profile, half-length slots (CAPI), one is x8 Gen4 low-profile, half-length slots (with x16 connectors) (CAPI), one is x8 Gen4 low-profile, half-length slots (with x16 connectors), two are x16 Gen4 low-profile, half-length slots, and four are x8 Gen4 low-profile, half-length slots (one of these slots is used for the required base LAN adapter).

With one POWER9 processor SCM, eight PCIe slots are available. One is x16 Gen4 low-profile, half-length slot (CAPI), one is x8 Gen4 low-profile, half-length slot (with x16 connector) (CAPI), two are x16 Gen4 low-profile, half-length slots, and four are x8 Gen4 low-profile, half-length slots (one of these slots is used for the required base LAN adapter).

The x16 slots can provide up to twice the bandwidth of x8 slots because they offer twice as many PCIe lanes. PCIe Gen4 slots can support up to twice the bandwidth of a PCIe Gen3 slot, and PCIe Gen3 slots can support up to twice the bandwidth of a PCIe Gen2 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, SAS bays, and storage backplane options

- Storage backplane with two front PCIe Gen4 capable NVMe U.2 drive slots (#EJ1V)
- Storage backplane with four front PCIe Gen4 capable NVMe U.2 drive slots (#EJ1W)
- Base storage backplane 8 SFF-3 bays (#EJ1F)
- Split backplane 4 + 4 SFF-3 bays (#EJ1H)
- Expanded function storage backplane 8 SFF-3 bays/single IOA with write cache (#EJ1G)

The backplane option provides SFF-3 SAS bays in the system unit. These 2.5-inch or small form factor (SFF) SAS bays can contain SAS drives (HDD or SSD) mounted on a Gen3 tray or carrier. Thus the drives are designated SFF-3. SFF-1 or SFF-2 drives do not fit in an SFF-3 bay. All SFF-3 bays support concurrent maintenance or hot-plug capability.

This backplane option uses leading-edge, integrated SAS RAID controller technology designed and patented by IBM. A custom-designed PowerPC^(R) based ASIC chip is the basis of these SAS RAID controllers and provides RAID 0/RAID 5/RAID 6/RAID 10 functionality with HDDs and SSDs. Internally, SAS ports are implemented and provide plenty of bandwidth. The integrated SAS controllers are placed in dedicated slots and do not reduce the number of available PCIe slots.

The feature EJ1F storage backplane option provides eight SFF-3 bays and one SAS controller with zero write cache.

By optionally adding the feature EJ1H split backplane, a second integrated SAS controller with no write cache is provided, and the eight SFF-3 bays are logically divided into two sets of four bays. Each SAS controller independently runs one of the four-bay sets of drives.

This backplane option support HDDs or SSDs or a mixture of HDDs and SSDs in the SFF-3 bays. Mixing HDDs and SSDs applies even within a single set of four bays of the split backplane option. Note that if you are mixing HDDs and SSDs, they must be in separate arrays (unless using the Easy Tier[®] function).

This backplane option can offer different drive protection options: RAID 0, RAID 5, RAID 6, or RAID 10. RAID 5 requires a minimum of three drives of the same capacity. RAID 6 requires a minimum of four drives of the same capacity. RAID 10 requires a minimum of two drives. Hot spare capability is supported with RAID 5, or RAID 6, or RAID 10.

Note that RAID 5 and RAID 6 result in more drive write activity than mirroring or than unprotected drives.

This backplane option is supported by AIX, Linux, and VIOS. It is highly recommended but not required that the drives be protected.

If you need a change after the server is installed, the backplane option can be changed. For example, the feature EJ1H split backplane feature can be added to an existing feature EJ1F base storage backplane.

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

In addition to supporting HDDs and SSDs in the SFF-3 SAS bays, the expanded function storage backplane feature EJ1G supports the optional attachment of an EXP12SX/EXP24SX drawer. All bays are accessed by both of the integrated SAS controllers. The bays support concurrent hot-plug maintenance.

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

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

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

Four USB-3 ports are available for general client use; two are located in front and two in the rear. Additionally, there are two USB-2 ports in the service processor located in the rear of the system. These ports are for limited client use. A converter cable ECCF provides a USB-to-9-pin D-Shell connection for this function.

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 should provide the locations where the PCIe Gen3 I/O expansion drawers must be placed to avoid locating them adjacent to vertical PDU locations, EIA 6 through 16 and 21 through 31.

The I/O expansion drawer can be migrated from a POWER8 to a POWER9 processor-based system. Only I/O cards supported on POWER9 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 (#EMXF or #EMXG) installed in the rear of the I/O expansion drawer.

For a 2U server configuration with two processor modules, up to one I/O expansion drawer and two fanout modules (#EMXF or #EMXG) connected to two optical cable adapters (#EJ05) are supported. For a 2U server configuration with one processor module, up to one I/O expansion drawer and one fanout module (#EMXF or #EMXG) connected to one optical cable adapter (#EJ05) is supported (the right PCIe module bay must be populated by a filler module).

For a 2U server configuration with two processor modules, up to two I/O expansion drawers and three fanout modules (#EMXH) connected to three optical cable adapters (#EJ1R) are supported (the right PCIe module bay for the second I/O expansion drawer must be populated by a filler module). For a 2U server configuration with one processor module, up to one I/O expansion drawer and one fanout module (#EMXH) connected to one optical cable adapter (#EJ1R) is supported (the right PCIe module bay must be populated by a filler module).

Limitations:

- Mixing of prior PCIe3 fanout modules (#EMXF or #EMXG) with PCIe3 fanout module (feature #EMXH) in the same I/O expansion drawer is not allowed.
- Mixing of I/O expansion drawer with prior PCIe3 fanout modules (#EMXF or #EMXG) and I/O expansion drawer with PCIe3 fanout module (#EMXH) in same configuration is allowed.
- PCIe3 optical cable adapters (#EJ1R) require use of optical cables (#ECCX or #ECCY) or copper cable (#ECCS).

RDX docking station

The RDX docking station EUA4 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/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/performance option.

EXP24SX SAS storage enclosure (#ESLS)

The EXP24SX is a storage expansion enclosure with twenty-four 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 Power S914, Power S922, and Power S924 servers by AIX, IBM i, Linux, and VIOS.

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,

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. The predecessor EXP24S did not support this mode change in the field.

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 POWER9 scale-out server such as the Power H922 or Power H924 servers. 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)

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)
- YO12 cables: 1.5-meter copper (#ECDT), 3-meter copper (#ECDU)
- 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)
- 100M 100 GbE Optical Cable QSFP28 (AOC) (#EB5Y)

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, 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	Adapter/ Controller	Cable to drawer	Environment
#EJW0	Mode 1	CEC SAS Ports	2 YO12 cables	AIX/IBM i/ Linux/VIOS
#EJW1	Mode 1	One (unpaired) #EJ0J/#EJ0M	1 YO12 cable	AIX/IBM i/ Linux/VIOS

Specify code	Mode	Adapter/ Controller	Cable to drawer	Environment
#EJW2	Mode 1	Two (one pair) #EJ0J/ #EJ0M	2 YO12 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) #EJ0J/#EJ0M	2 X12 cables	AIX/Linux/ VIOS
#EJW6	Mode 2	One (unpaired) #EJ0J/#EJ0M	2 YO12 cables	AIX/Linux/ VIOS
#EJW7	Mode 2	Two (unpaired) #EJ0J/#EJ0M	2 YO12 cables	AIX/Linux/ VIOS
#EJWF	Mode 1	Two (one pair) #EJ14	2 YO12 cables	AIX/IBM i/ Linux/VIOS
#EJWG	Mode 2	Two (one pair) #EJ14	2 X12 cables	AIX/Linux/ VIOS
#EJWJ	Mode 2	Four (two pair) #EJ14	2 X12 cables	AIX/Linux/ VIOS
#EJWU	Mode 1	Controller #EJ1G	1 YO12 cables	Linux/AIX

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	Mode	Adapter/ Controller	Cable to drawer	Environment
#EJWA (1/2 of #EJW7)	Mode 2	One (unpaired) #EJ0J/#EJ0M	1 YO12 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 cables	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 cables	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 twenty-four 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 (#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/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 and controllers, drives 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 cm (23.4 - 29.5 in.). Slot filler panels are provided for empty bays when initially shipped from IBM.

EXP12SX SAS storage enclosure (#ESLL)

The EXP12SX is a storage expansion enclosure with twelve 3.5-inch LFF SAS bays. It supports up to 12 hot-plug HDDs in only 2 EIA of space in a 19-inch rack. The EXP12SX SFF bays use LFF Gen1 (LFF-1) carriers/trays. The 4k byte sector drives (#4096 or #4224) are supported. SSDs are not supported.

The EXP12SX drawer feature ESLL is supported on the Power S914, Power S922, and Power S924 servers by AIX, Linux, and VIOS.

With AIX/Linux/VIOS, the EXP12SX enclosure can be ordered with four sets of 3 bays (mode 4), two sets of 6 bays (mode 2), or one set of 12 bays (mode 1). The mode setting can be changed in the field using software commands along with a specifically documented procedure.

Important: When changing modes, it is very important that you follow the 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 EXP12SX are attached to PCIe Gen3 SAS adapters or attached to an integrated SAS controller in a POWER9 scale-out server such as the

Power S914, Power S922, or Power S924 servers. The following PCIe3 SAS adapters support the EXP12SX:

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

Earlier generation PCIe2 or PCIe1 SAS adapters are not supported with the EXP12SX drawer.

The EXP12SX drawer and the PCIe3 SAS adapters or integrated SAS controllers are attached through SAS YO12 or X12 cables. X12 and YO12 cables are designed to support up to 12 Gb. The PCIe Gen3 SAS adapters support up to 6 Gb throughput. The EXP12SX 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)
- YO12 cables: 1.5-meter copper (#ECDT), 3-meter copper (#ECDU)
- 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)
- 100M 100 GbE Optical Cable QSFP28 (AOC) (#EB5Y)

An AA12 cable interconnecting a pair of PCIe3 12 GB cache adapters (two #EJ14) is not attached to the EXP12SX drawer. 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 EXP12SX I/O drawer (#ESLL) 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 EXP12SX configurations represented by these specify codes.

Specify	Mode	Adapter/ Controller	Cable to drawer	Environment
#EJV0	Mode 1	CEC SAS Ports	2 YO12 cables	AIX/Linux/ VIOS
#EJV1	Mode 1	One (unpaired) #EJ0J/#EJ0M	1 YO12 cable	AIX/Linux/ VIOS
#EJV2	Mode 1	Two (unpaired) #EJ0J/#EJ0M	2 YO12 cables	AIX/Linux/ VIOS
#EJV3	Mode 2	Two (one pair) #EJ0J/ #EJ0M	2 X12 cables	AIX/Linux/ VIOS
#EJV4	Mode 2	Four (two pair) #EJ0J/ #EJ0M	2 X12 cables	AIX/Linux/ VIOS
#EJV5	Mode 4	Four (unpaired) #EJ0J/#EJ0M	2 X12 cables	AIX/Linux/ VIOS

Specify	Mode	Adapter/ Controller	Cable to drawer	Environment
#EJV6	Mode 2	One(unpaired) #EJ0J/#EJ0M	2 YO12 cables	AIX/Linux/ VIOS
#EJV7	Mode 2	Two (unpaired) #EJ0J/#EJ0M	2 YO12 cables	AIX/Linux/ VIOS
#EJVF	Mode 1	Two #EJ14 (one pair)	2 YO12 cables	AIX/Linux/ VIOS
#EJVG	Mode 2	Two #EJ14 (one pair)	2 X12 cables	AIX/Linux/ VIOS
#EJVJ	Mode 2	Four #EJ14 (two pair)	2 X12 cable	AIX/Linux/ VIOS
#EJVU	Mode 1	Controller #EJ1G/ #EL67	1 YO12 cables	Linux

All of the above EXP12SX 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	Mode	Adapter/ Controller	Cable to drawer	Environment
#EJVA (1/2 of #EJV7)	Mode 2	One (unpaired) #EJ0J/#EJ0M	1 YO12 cables	AIX/Linux/ VIOS
#EJVB (1/2 of #EJV4)	Mode 2	One pair #EJ0J/#EJ0M	1 X12 cable	AIX/Linux/ VIOS
#EJVC (1/4 of #EJV5)	Mode 4	One (unpaired) #EJ0J/#EJ0M	1 X12 cable	AIX/Linux/ VIOS
#EJVD (2/4 of #EJV5)	Mode 4	Two (unpaired) #EJ0J/#EJ0M	1 X12 cables	AIX/Linux/ VIOS
#EJVE (3/4 of #EJV5)	Mode 4	Three (unpaired) #EJ0J/#EJ0M	2 X12 cables	AIX/Linux/ VIOS

An EXP12SX 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 EXP12SX 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.

The 3.5-inch large form factor (LFF) SAS HDDs are supported in the EXP24SX. All drives are mounted on Gen1 carriers/trays and thus named LFF-1 drives. Only 4k byte sector drives are supported in the EXP24SX drawer. The 5xx byte sector drives are not announced or planned. Drives are 7200 rpm and sometimes referred to as *nearline*. These drives provide excellent cost per gigabyte. Note that formatting or rebuilding arrays on large disk drives can take hours. If higher performance is required, consider higher rpm disks or SSDs in the EXP24SX drawer.

The EXP12SX drawer has many high-reliability design points:

- SAS bays that support hot swap

- Redundant and hot-plug power and fan assemblies
- Dual line cords
- Redundant and hot-plug ESMs
- Redundant data paths to all drives
- LED indicators on drives, bays, ESMs, and power supplies that support problem identification
- Through the SAS adapters and controllers, drives 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 cm (23.4 - 29.5 in.). Slot filler panels are provided for empty bays when initially shipped from IBM.

EXP24SX and EXP12SX enclosures can be mixed on the same server. EXP24SX and EXP12SX enclosures can be mixed on the same PCIe3 adapter.

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. AOC cables are also 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 m is offered. Note that the cable management arm of the scale-out servers requires about 1 m 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.

High-function (switched and monitored) Power Distribution Units (PDUs)

The high-function PDUs provide switching, better monitoring, and 50% more C19 receptacles than previous Power Systems PDUs. Depending on country wiring standards, either two or four full-price features are orderable.

	208 V 3-phase delta	200 V - 240 V 1-phase or 3-phase wye
12xC13	#EPTQ	#EPTN
9xC19	#EPTL	#EPTJ

These PDUs can be mounted vertically in rack-side pockets or they can be mounted horizontally. If mounted horizontally, they each use 1 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. The PDU is shipped with a generic PDU password. IBM strongly urges you to change the password upon installation.

These PDUs do provide the same low price as the low-function 12xC13 PDU feature (#7188).

High-function (switched and monitored) PDUs plus

Hardware

- IEC 62368-1 and IEC 60950 safety standard
- A new product safety approval
- No China 5000 m 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 (ASR)
- Ethernet 10/100/1000 Mb/s

Software

- IPv4 and IPv6 support
- SSH 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
12xC13	#ECJQ/#ECJP	#ECJN/#ECJM
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 the client 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 m (14-Ft) PDU to Wall 3PH/24A 200-240V Delta-wired Power Cord
- #ECJ7 - 4.3 m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power Cord

No pigtail (like feature 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.

High-function 12xC13 PDU plus 3-phase delta (#ECJQ/#ECJP)

This is an intelligent, switched 200 - 240 volt 3-phase delta AC 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 one EIA (1U) of rack space. See feature EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One wall line cord is also ordered separately and attaches to the Amphenol inlet connector. Supported line cords include features ECJ5 and ECJ7.

Two RJ45 ports on the front of the PDU enable clients to monitor the electrical power usage of each receptacle 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.

Features ECJP and ECJQ are identical PDUs. Up to one lower-priced feature ECJP can be ordered with a new 7014-T42/T00 rack in place of a no-charge feature 9188 PDU.

For comparison, this is most like the earlier generation feature EPTP 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 customer's responsibility to configure this PDU. In any case, the Ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

High-function 9xC19 PDU plus 3-phase delta (#ECJL/#ECJK)

This is an intelligent, switched 200 - 240 volt 3-phase delta AC 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 one EIA (1U) of rack space. See feature EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One wall line cord is also ordered separately and attaches to the Amphenol inlet connector. Supported line cords include features ECJ5 and ECJ7.

Two RJ45 ports on the front of the PDU enable you to monitor the electrical power usage of each receptacle 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.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are not easily accessed, and therefore IBM does not generally recommend their use.

Features ECJK and ECJL are identical PDUs. Up to one lower-priced feature ECJK can be ordered with a new 7014-T42/T00 rack in place of a no-charge feature 9188 PDU.

For comparison, this is most like the earlier generation feature EPTL PDU.

Limitation: Some configurations of the 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 customer's responsibility to configure this PDU. In any case, the Ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

High-function 9xC19 1-phase or 3-phase wye PDU plus (#ECJJ/#ECJG)

This is an intelligent, switched 200 - 240 volt 1-phase or 380 - 415/220 - 240 volt 3-phase wye AC 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 1-phase or 3-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 3-phase wye PDUs.

The PDU can be mounted vertically in rack-side pockets, or it can be mounted horizontally. If mounted horizontally, it uses one EIA (1U) of rack space. See feature EPTH for horizontal mounting hardware.

Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features 6489, 6491, 6492, 6653, 6654, 6655, 6656, 6657, 6658, and 6667.

Two RJ45 ports on the front of the PDU enable clients to monitor the electrical power usage of each receptacle 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.

There are also three C13 receptacles on the rear of the PDU positioned toward the middle of the rack. These are not easily accessed, and therefore IBM does not generally recommend their use.

Features ECJG and ECJJ are identical PDUs. Up to one lower-priced feature ECJG can be ordered with a new 7014-T42/T00 rack in place of a no-charge feature 9188 PDU.

For comparison, this is most like the earlier generation feature EPTJ PDU.

Limitation: Some configurations of the 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 customer's responsibility to configure this PDU. In any case, the Ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

High-function 12xC13 1-phase or 3-phase wye PDU plus (#ECJN/#ECJM)

This is an intelligent, switched 200 - 240 volt 1-phase or 380 - 415/220 - 240 volt 3-phase wye AC 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 1-phase or 3-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 3-phase wye PDUs.

See 3-phase #ECJP/#ECJQ for countries that 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 one EIA (1U) of rack space. See feature EPTH for horizontal mounting hardware.

Device power cords with a C14 plug connect to C13 PDU receptacles and are ordered separately. One country-specific wall line cord is also ordered separately and attaches to a UTG524-7 connector on the front of the PDU. Supported line cords include features 6489, 6491, 6492, 6653, 6654, 6655, 6656, 6657, 6658, and 6667.

Two RJ45 ports on the front of the PDU enable you to monitor the electrical power usage of each receptacle 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.

Features ECJM and ECJN are identical PDUs. Up to one lower-priced feature ECJM can be ordered with a new 7014-T42/T00 rack in place of a no-charge feature 9188 PDU.

For comparison, this is most like the earlier generation feature EPTN PDU.

Limitation: Some configurations of the 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 customer's responsibility to configure this PDU. In any case, the Ethernet port on the Intelligent PDU must not be connected to the ESS Management switch.

Power S922 Epic Solution configurations

Power S922 Epic Solution Edition provides a more cost-effective solution for small-to-medium hospitals ordering a new Power S922 server. The two available configurations are:

- S922 Healthcare Solution Edition for Operational Databases (ODB): Configuration supports the operation core processing of the healthcare solution
- S922 Healthcare Solution Edition for Edge Computing Processing (ECP): Configuration supports edge computing and branch sites to enable local processing and availability, working as an extension of a central compute server.

The following features help eligible Epic clients to order and effectively price the configuration:

- Epic Solution Indicator for 22G (#EHM0)
- 512 GB (16 x 32 GB) Memory DIMMs bundle (#EM67)

The above features are available only with a new server order. MES orders can use the regular feature numbers with their regular pricing.

A Power S922 Epic Solution configuration is a 20-core, 2-socket server running AIX. An initial hardware order includes the following components:

Feature	Description	Default	Min	Max	Rules/Comments
EHM0	POWER9 Epic Solution Indicator for 22G		1	1	
EM67	512 GB (16 x 32 GB) Memory DIMMs bundle for EPIC Solution Edition		1	1	Reduce price bundled feature for memory is required. If additional memory is desired on an initial order, only allow quantity of sixteen of feature #EM63 (32Gb).
EP59	10-core Typical 2.9 to 3.8 Ghz (max)		2	2	

POWER9 Processor			
EP69	One Processor Core Activation for #EP59		20 20
ESDB	300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)	2	Defaulted but client allowed to replace with other NVMe Bolt features. If Boot from SAN (#0837) is on the order, then no drives required.
EN0B	PCIe3 LP 16Gb 2-port Fibre Channel Adapter	2	Default #EN0B Qty 2 for Operational Databases (ODB) configuration. Allowed to replace or add from available 16 GB or higher Fibre Channel cards. Not allowed for Edge Computing Processing (ECP) configuration.
EN0J	PCIe3 LP 4-port (10Gb FCoE & 1GbE) SR&RJ45	2	Default #EN0J Qty 2. Qty 2 of 10 GB or higher LAN cards are required. Allowed to replace or add from available 10 GB or higher LAN cards.
EJ1F	Base Storage Backplane 8 SFF-3 Bays		1 1
EJU6	Front IBM Bezel for 8-Bay BackPlane		1 1
2146	Primary OS -AIX		1
4650	Rack Indicator-		1

	Not Factory Integrated		
5000	Software Preload	1	Defaulted but can be deselected-- there is no minimum required.
5228	PowerVM Enterprise Edition	20	
9440	New AIX License Core Counter	20	

Notes:

- Additional hardware components can be added as desired following normal supported configuration rules. The above is the predefined configuration.
- Additional software and maintenance can be added as desired following normal supported configuration rules.

To see if you are eligible to order this solution edition, see the [IBM Power Solution Editions for healthcare](#) website. Also, the sales channel can register each server using this solution edition at this website.

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.

Memory subsystem RAS

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

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 Systems family does ambient and over temperature monitoring and reporting.

POWER9 processor functions

As in POWER8, the POWER9 processor has the ability to do processor instruction retry for some transient errors.

Cache availability

The L2 and L3 caches in the POWER9 processor in the memory buffer chip are protected with double-bit detect, single-bit correct error detection buffer 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. If the data is used, termination may be limited to the program/kernel or hypervisor owning the data; or the I/O adapters controlled by an I/O hub controller would freeze if data were transferred to an I/O device.

PCI extended error handling

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

Uncorrectable error recovery

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

Serviceability

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

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

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

Service environment

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

The POWER9 processor-based platforms support several service environments:

- Attachment to one or more HMCs or vHMCs is a supported option by the system with PowerVM. This is the default configuration for servers supporting logical partitions with dedicated or virtual I/O. In this case, all servers have at least one logical partition.
- For non-HMC systems.
 - Full-system partition with PowerVM: A single partition owns all the server resources, and only one operating system may be installed. The primary service interface is through the operating system and the service processor.

Service interface

Support personnel can use the service interface to communicate with the service support applications in a server using an operator console, a graphical user interface on the management console or service processor, or an operating system terminal. The service interface helps to deliver a clear, concise view of available service applications, helping the support team to manage system resources and service information in an efficient and effective way. Applications available through the service interface are carefully configured and placed to give service providers access to important service functions.

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

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

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

First Failure Data Capture and error data analysis

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

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

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

Diagnostics

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

- Provide a common error code format equivalent to a system reference code with PowerVM, system reference number, checkpoint, or firmware error code.

- Provide fault detection and problem isolation procedures. Support remote connection ability to be used by the IBM Remote Support Center or IBM Designated Service.
- Provide interactive intelligence within the diagnostics with detailed online failure information while connected to IBM's back-end system.

Automatic diagnostics

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

Stand-alone diagnostics with PowerVM

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

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

Concurrent maintenance

The determination of whether a firmware release can be updated concurrently is identified in the readme information file that is released with the firmware. An HMC is required for the concurrent firmware update with PowerVM. In addition, concurrent maintenance of PCIe adapters is supported with PowerVM. Concurrent maintenance of the Operator Panel is supported through ASMI. Additional concurrent maintenance includes power supplies, fans, and HDD/SSD drives.

Service labels

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

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

QR labels

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

Packaging for service

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

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

Error handling and reporting

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

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

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

Live Partition Mobility

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

Service processor

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

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

Call home

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

IBM Electronic Services

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

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

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

Benefits: increased uptime

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

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

For additional information, see the [IBM Electronic Service Agent](#) website.

More accurate reporting

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

Customized support

By using the IBMid entered during activation, clients can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Services website.

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

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

For more information on how to utilize the power of IBM Electronic Services, see the following website or contact an [IBM Systems Services Representative](#).

Section 508 of the US Rehabilitation Act

The Power S922 server (9009-22G) is capable as of July 24, 2020, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be found on the [Product accessibility information](#) website.

Statement of general direction

IBM Power Systems S922 server insights:

IBM plans to introduce a 110-volt power supply to the IBM Power Systems S922 server (9009-22G) when configured with the 1-core processor or the 4-core processor options.

IBM plans to introduce the IBM i Solution Edition on the IBM Power Systems S922 server (9009-22G) with a 1-core processor.

Statements by IBM regarding its plans, directions, and intent are subject to change or withdrawal without notice at the sole discretion of IBM. Information regarding potential future products is intended to outline general product direction and should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for IBM products remain at the sole discretion of IBM.

Product number

The following are newly announced features on the specific models of the IBM Power Systems 9009 machine type:

Description	Machine type	Model number	Feature number
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IBM Power System S922	9009	22G	
USB 3.0 Cable - Internal connector to rear port	9009	22G	EBK8
Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9009	22G	EC5V
Mainstream 800 GB SSD PCIe3 NVMe U.2 module for AIX/Linux	9009	22G	EC5X
IBM i Enablement for processor EP5Y	9009	22G	EEPY
POWER9 Epic Solution indicator for 22G	9009	22G	EHM0
NVMe U.2 Passthru adapter Gen4 capable	9009	22G	EJ1Q
Storage backplane with two front PCIe Gen4 capable NVMe U.2 drive slots	9009	22G	EJ1V
Storage backplane with four front PCIe Gen4 capable NVMe U.2 drive slots	9009	22G	EJ1W
Front IBM Bezel for 4 NVMe-Bay BackPlane	9009	22G	EJUN
Front OEM Bezel for 4 NVMe-Bays BackPlane	9009	22G	EJUP
ES1F Load Source Specify (1.6 TB 4K NVMe U.2 SSD PCIe4 for IBM i)	9009	22G	ELS3
PCIe3 2-Port 16Gb Fibre Channel Adapter	9009	22G	EN1G
PCIe3 LP 2-Port 16Gb Fibre Channel Adapter	9009	22G	EN1H
200 GB IBM i NVMe Load Source Namespace size	9009	22G	ENSA
400 GB IBM i NVMe Load Source Namespace size	9009	22G	ENSB
4-core Typical 2.8 to 3.8 Ghz (max) POWER9 Processor	9009	22G	EP56
8-core Typical 3.4 to 3.9 Ghz (max) POWER9 Processor	9009	22G	EP58
10-core Typical 2.9 to 3.8 Ghz (max) POWER9 Processor	9009	22G	EP59
11-core Typical 2.8 to 3.8 Ghz (max) POWER9 Processor	9009	22G	EP5B
1-core Typical 2.8 to 3.8 Ghz (max) POWER9 Processor	9009	22G	EP5Y
One Processor Core Activation for #EP56	9009	22G	EP66
One Processor Core Activation for #EP58	9009	22G	EP68
One Processor Core Activation for #EP59	9009	22G	EP69
One Processor Core Activation for #EP5B	9009	22G	EP6B
One Processor Core Activation for #EP5Y	9009	22G	EP6Y
Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9009	22G	ES1E
Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for IBM i	9009	22G	ES1F
Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9009	22G	ES1G

The following are features already announced for the IBM Power Systems 9009 machine type:

Description	Machine type	Model number	Feature number
One CSC Billing Unit	9009	22G	0010
Ten CSC Billing Units	9009	22G	0011
Mirrored System Disk Level, Specify Code	9009	22G	0040
Device Parity Protection-All, Specify Code	9009	22G	0041
Device Parity RAID-6 All, Specify Code	9009	22G	0047
RISC-to-RISC Data Migration	9009	22G	0205
AIX Partition Specify	9009	22G	0265
Linux Partition Specify	9009	22G	0266
IBM i Operating System Partition Specify	9009	22G	0267
Mirrored Level System Specify Code	9009	22G	0308
V.24/EIA232 6.1m (20-Ft) PCI Cable	9009	22G	0348
V.35 6.1m (20-Ft) PCI Cable	9009	22G	0353
X.21 6.1m (20-Ft) PCI Cable	9009	22G	0359
CBU Specify	9009	22G	0444
Customer Specified Placement	9009	22G	0456
19 inch, 1.8 meter high rack	9009	22G	0551
19 inch, 2.0 meter high rack	9009	22G	0553
Rack Filler Panel Kit	9009	22G	0599
Load Source Not in CEC	9009	22G	0719
EXP24S SFF Gen2 Load Source Specify (#5887 or #EL1S)	9009	22G	0728

SAN Load Source Specify	9009	22G	0837
US TAA Compliance Indicator	9009	22G	0983
Product assembled in USA manufacturing plant	9009	22G	0984
Modem Cable - US/Canada and General Use	9009	22G	1025
USB 500 GB Removable Disk Drive	9009	22G	1107
Custom Service Specify, Rochester Minn, USA	9009	22G	1140
Quantity 150 of #1964	9009	22G	1818
Quantity 150 of #1953	9009	22G	1929
300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9009	22G	1953
600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9009	22G	1964
Primary OS - IBM i	9009	22G	2145
Primary OS - AIX	9009	22G	2146
Primary OS - Linux	9009	22G	2147
IBM i with VIOS Only System Indicator	9009	22G	2148
Factory Deconfiguration of 1-core	9009	22G	2319
2M LC-SC 50 Micron Fiber Converter Cable	9009	22G	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	9009	22G	2459
3M Asynchronous Terminal/Printer Cable EIA-232	9009	22G	2934
Asynchronous Cable EIA-232/V.24 3M	9009	22G	2936
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M	9009	22G	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	9009	22G	3125
Widescreen LCD Monitor	9009	22G	3632
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	9009	22G	3925
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	9009	22G	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	9009	22G	3928
System Serial Port Converter Cable	9009	22G	3930
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	9009	22G	4242
Extender Cable - USB Keyboards, 1.8M	9009	22G	4256
VGA to DVI Connection Converter	9009	22G	4276
Rack Integration Services	9009	22G	4649
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
Rack Indicator- Not Factory Integrated	9009	22G	4650
Rack Indicator, Rack #1	9009	22G	4651
Rack Indicator, Rack #2	9009	22G	4652
Rack Indicator, Rack #3	9009	22G	4653
Rack Indicator, Rack #4	9009	22G	4654
Rack Indicator, Rack #5	9009	22G	4655
Rack Indicator, Rack #6	9009	22G	4656
Rack Indicator, Rack #7	9009	22G	4657
Rack Indicator, Rack #8	9009	22G	4658
Rack Indicator, Rack #9	9009	22G	4659
Rack Indicator, Rack #10	9009	22G	4660
Rack Indicator, Rack #11	9009	22G	4661
Rack Indicator, Rack #12	9009	22G	4662
Rack Indicator, Rack #13	9009	22G	4663
Rack Indicator, Rack #14	9009	22G	4664
Rack Indicator, Rack #15	9009	22G	4665
Rack Indicator, Rack #16	9009	22G	4666
Power Active Memory Expansion Enablement	9009	22G	4793
Software Preload Required	9009	22G	5000
PowerVM Enterprise Edition	9009	22G	5228
PCIe2 LP 4-port 1GbE Adapter	9009	22G	5260
PCIe LP POWER ^(R) GXT145 Graphics Accelerator	9009	22G	5269
PCIe LP 8Gb 2-Port Fibre Channel Adapter	9009	22G	5273
Sys Console On HMC	9009	22G	5550
System Console-Ethernet LAN adapter	9009	22G	5557
PCIe2 8Gb 4-port Fibre Channel Adapter	9009	22G	5729
8 Gigabit PCI Express ^(R) Dual Port Fibre Channel Adapter	9009	22G	5735
4 Port Async EIA-232 PCIe Adapter	9009	22G	5785
EXP24S SFF Gen2-bay Drawer	9009	22G	5887
PCIe2 4-port 1GbE Adapter	9009	22G	5899
Opt Front Door for 1.8m Rack	9009	22G	6068

Opt Front Door for 2.0m Rack	9009	22G	6069
1.8m Rack Acoustic Doors	9009	22G	6248
2.0m Rack Acoustic Doors	9009	22G	6249
1.8m Rack Trim Kit	9009	22G	6263
2.0m Rack Trim Kit	9009	22G	6272
Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)	9009	22G	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9009	22G	6460
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU (250V/15A) U. S.	9009	22G	6469
Power Cord 1.8m (6-ft), Drawer to wall (125V/15A)	9009	22G	6470
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (250V/10A)	9009	22G	6471
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (250V/16A)	9009	22G	6472
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (250V/10A)	9009	22G	6473
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/13A)	9009	22G	6474
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	9009	22G	6475
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9009	22G	6476
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	9009	22G	6477
Power Cord 2.7 M(9-foot), To wall/OEM PDU, (250V, 16A)	9009	22G	6478
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (125V/15A or 250V/10A)	9009	22G	6488
4.3m (14-Ft) 3PH/32A 380-415V Power Cord	9009	22G	6489
4.3m (14-Ft) 1PH/63A 200-240V Power Cord	9009	22G	6491
4.3m (14-Ft) 1PH/48A 200-240V Power Cord	9009	22G	6492
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9009	22G	6493
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9009	22G	6494
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	9009	22G	6496
Power Cable - Drawer to IBM PDU, 200-240V/10A	9009	22G	6577
Optional Rack Security Kit	9009	22G	6580
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A)	9009	22G	6651
4.3m (14-Ft) 3PH/16A 380-415V Power Cord	9009	22G	6653
4.3m (14-Ft) 1PH/24A Power Cord	9009	22G	6654
4.3m (14-Ft) 1PH/24A WR Power Cord	9009	22G	6655
4.3m (14-Ft) 1PH/32A Power Cord	9009	22G	6656
4.3m (14-Ft) 1PH/32A Power Cord	9009	22G	6657
4.3m (14-Ft) 1PH/24A Power Cord-Korea	9009	22G	6658
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 15A)	9009	22G	6659
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU (125V/15A)	9009	22G	6660
Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)	9009	22G	6665
4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia	9009	22G	6667
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9009	22G	6669
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9009	22G	6671
Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A	9009	22G	6672
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9009	22G	6680
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	9009	22G	7109
Environmental Monitoring Probe	9009	22G	7118
Power Distribution Unit	9009	22G	7188
Power Distribution Unit (US) - 1 EIA Unit, Universal, Fixed Power Cord	9009	22G	7196
Ethernet Cable, 15m, Hardware Management Console to System Unit	9009	22G	7802
Linux Software Preinstall	9009	22G	8143

Linux Software Preinstall (Business Partners)	9009	22G	8144
USB Mouse	9009	22G	8845
Order Routing Indicator- System Plant	9009	22G	9169
Language Group Specify - US English	9009	22G	9300
Specify mode-1 & CEC SAS port for EXP24 #5887/ ELIS	9009	22G	9387
New AIX License Core Counter	9009	22G	9440
New IBM i License Core Counter	9009	22G	9441
New Red Hat License Core Counter	9009	22G	9442
New SUSE License Core Counter	9009	22G	9443
Other AIX License Core Counter	9009	22G	9444
Other Linux License Core Counter	9009	22G	9445
3rd Party Linux License Core Counter	9009	22G	9446
VIOS Core Counter	9009	22G	9447
Other License Core Counter	9009	22G	9449
Ubuntu Linux License Core Counter	9009	22G	9450
Month Indicator	9009	22G	9461
Day Indicator	9009	22G	9462
Hour Indicator	9009	22G	9463
Minute Indicator	9009	22G	9464
Qty Indicator	9009	22G	9465
Countable Member Indicator	9009	22G	9466
Language Group Specify - Dutch	9009	22G	9700
Language Group Specify - French	9009	22G	9703
Language Group Specify - German	9009	22G	9704
Language Group Specify - Polish	9009	22G	9705
Language Group Specify - Norwegian	9009	22G	9706
Language Group Specify - Portuguese	9009	22G	9707
Language Group Specify - Spanish	9009	22G	9708
Language Group Specify - Italian	9009	22G	9711
Language Group Specify - Canadian French	9009	22G	9712
Language Group Specify - Japanese	9009	22G	9714
Language Group Specify - Traditional Chinese (Taiwan)	9009	22G	9715
Language Group Specify - Korean	9009	22G	9716
Language Group Specify - Turkish	9009	22G	9718
Language Group Specify - Hungarian	9009	22G	9719
Language Group Specify - Slovakian	9009	22G	9720
Language Group Specify - Russian	9009	22G	9721
Language Group Specify - Simplified Chinese (PRC)	9009	22G	9722
Language Group Specify - Czech	9009	22G	9724
Language Group Specify - Romanian	9009	22G	9725
Language Group Specify - Croatian	9009	22G	9726
Language Group Specify - Slovenian	9009	22G	9727
Language Group Specify - Brazilian Portuguese	9009	22G	9728
Language Group Specify - Thai	9009	22G	9729
QSFP+ 40GbE Base-SR Transceiver	9009	22G	EB27
1m (3.3-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	9009	22G	EB2B
3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	9009	22G	EB2H
10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable	9009	22G	EB2J
30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable	9009	22G	EB2K
AC Power Supply - 1400W for Server (200-240 VAC)	9009	22G	EB2M
Lift tool based on GenieLift GL-8 (standard)	9009	22G	EB3Z
10GbE Optical Transceiver SFP+ SR	9009	22G	EB46
25GbE Optical Transceiver SFP28	9009	22G	EB47
0.5m SFP28/25GbE copper Cable	9009	22G	EB4J
1.0m SFP28/25GbE copper Cable	9009	22G	EB4K
1.5m SFP28/25GbE copper Cable	9009	22G	EB4L
2.0m SFP28/25GbE copper Cable	9009	22G	EB4M
2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE	9009	22G	EB4P
Service wedge shelf tool kit for EB3Z	9009	22G	EB4Z
0.5m EDR IB Copper Cable QSFP28	9009	22G	EB50
1.0m EDR IB Copper Cable QSFP28	9009	22G	EB51
2.0M EDR IB Copper Cable QSFP28	9009	22G	EB52
1.5M EDR IB Copper Cable QSFP28	9009	22G	EB54
100GbE Optical Transceiver QSFP28	9009	22G	EB59
3M EDR IB Optical Cable QSFP28	9009	22G	EB5A
5M EDR IB Optical Cable QSFP28	9009	22G	EB5B
10M EDR IB Optical Cable QSFP28	9009	22G	EB5C

15M EDR IB Optical Cable QSFP28	9009	22G	EB5D
20M EDR IB Optical Cable QSFP28	9009	22G	EB5E
30M EDR IB Optical Cable QSFP28	9009	22G	EB5F
50M EDR IB Optical Cable QSFP28	9009	22G	EB5G
100M EDR IB Optical Cable QSFP28	9009	22G	EB5H
0.5M 100GbE copper Cable QSFP28	9009	22G	EB5J
1.0M 100GbE Copper Cable QSFP28	9009	22G	EB5K
1.5M 100GbE Copper Cable QSFP28	9009	22G	EB5L
2.0M 100GbE Copper Cable QSFP28	9009	22G	EB5M
25M EDR IB optical Cable QSFP28	9009	22G	EB5N
3M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5R
5M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5S
10M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5T
15M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5U
20M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5V
30M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5W
50M 100GbE Optical Cable QSFP28 (AOC)	9009	22G	EB5X
100M 100GbE optical Cable QSFP28 (AOC)	9009	22G	EB5Y
IBM i 7.2 Indicator	9009	22G	EB72
IBM i 7.3 Indicator	9009	22G	EB73
IBM i 7.4 Indicator	9009	22G	EB74
Slim Rear Acoustic Door	9009	22G	EC07
Slim Front Acoustic Door	9009	22G	EC08
PCIe3 LP 2-Port 10Gb NIC&ROCE SR/Cu Adapter	9009	22G	EC2R
PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter	9009	22G	EC2S
PCIe3 LP 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter	9009	22G	EC2T
PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter	9009	22G	EC2U
PCIe3 LP 2-port 10GbE NIC&ROCE SFP+ Copper Adapter	9009	22G	EC37
PCIe3 2-port 10GbE NIC&ROCE SFP+ Copper Adapter	9009	22G	EC38
PCIe3 LP 2-Port 40GbE NIC RoCE QSFP+ Adapter	9009	22G	EC3A
PCIe3 2-Port 40GbE NIC RoCE QSFP+ Adapter	9009	22G	EC3B
PCIe3 LP 2-port 100Gb EDR IB Adapter x16	9009	22G	EC3E
PCIe3 LP 2-port 100GbE (NIC& RoCE) QSFP28 Adapter x16	9009	22G	EC3L
PCIe3 LP 1-port 100Gb EDR IB Adapter x16	9009	22G	EC3T
PCIe2 LP 4-Port USB 3.0 Adapter	9009	22G	EC45
PCIe2 4-Port USB 3.0 Adapter	9009	22G	EC46
PCIe3 LP 3D Graphics Adapter x16	9009	22G	EC51
PCIe3 x8 LP 3.2 TB NVMe Flash adapter for AIX/Linux	9009	22G	EC5C
PCIe3 x8 LP 6.4 TB NVMe Flash adapter for AIX/Linux	9009	22G	EC5E
PCIe3 x8 LP 1.6 TB NVMe Flash Adapter for AIX/Linux	9009	22G	EC5G
PCIe4 LP 1-port 100Gb EDR IB CAPI adapter	9009	22G	EC62
PCIe4 LP 2-port 100Gb EDR IB CAPI adapter	9009	22G	EC64
PCIe4 LP 2-port 100Gb ROCE EN LP adapter	9009	22G	EC67
SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure	9009	22G	ECBJ
SAS X Cable 6m - HD Narrow 6Gb 2-Adapters to Enclosure	9009	22G	ECBK
SAS X Cable 10m - HD Narrow 6Gb 2-Adapters to Enclosure	9009	22G	ECBL
SAS X Cable 15m - HD Narrow 3Gb 2-Adapters to Enclosure	9009	22G	ECBM
5m (16.4-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	9009	22G	ECBN
SAS YO Cable 1.5m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBT
SAS YO Cable 3m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBU
SAS YO Cable 6m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBV
SAS YO Cable 10m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBW
SAS YO Cable 15m - HD Narrow 3Gb Adapter to Enclosure	9009	22G	ECBX
SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBY
SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure	9009	22G	ECBZ
3M Optical Cable Pair for PCIe3 Expansion Drawer	9009	22G	ECC7
10M Optical Cable Pair for PCIe3 Expansion Drawer	9009	22G	ECC8

System Port Converter Cable for UPS	9009	22G	ECCF
Variable Length, Blue Cat5e Cable	9009	22G	ECCG
Variable Length, Green Cat5e Cable	9009	22G	ECCH
3M Copper CXP Cable Pair for PCIe3 Expansion Drawer	9009	22G	ECCS
3M Active Optical Cable Pair for PCIe3 Expansion Drawer	9009	22G	ECCX
10M Active Optical Cable Pair for PCIe3 Expansion Drawer	9009	22G	ECCY
3.0M SAS X12 Cable (Two Adapter to Enclosure)	9009	22G	ECDJ
4.5M SAS X12 Active Optical Cable (Two Adapter to Enclosure)	9009	22G	ECDK
10M SAS X12 Active Optical Cable (Two Adapter to Enclosure)	9009	22G	ECDL
1.5M SAS Y012 Cable (Adapter to Enclosure)	9009	22G	ECDT
3.0M SAS Y012 Cable (Adapter to Enclosure)	9009	22G	ECDU
4.5M SAS Y012 Active Optical Cable (Adapter to Enclosure)	9009	22G	ECDV
10M SAS Y012 Active Optical Cable (Adapter to Enclosure)	9009	22G	ECDW
0.6M SAS AA12 Cable (Adapter to Adapter)	9009	22G	ECE0
3.0M SAS AA12 Cable	9009	22G	ECE3
4.5M SAS AA12 Active Optical Cable (Adapter to Adapter)	9009	22G	ECE4
4.3m (14-Ft) PDU to wall 3PH/24A 200-240V Delta-wired Power Cord	9009	22G	ECJ5
4.3m (14-Ft) PDU to wall 3PH/48A 200-240V Delta-wired Power Cord	9009	22G	ECJ7
High Function 9xC19 Single-Phase or Three-Phase Wye PDU plus	9009	22G	ECJJ
High Function 9xC19 PDU plus 3-Phase Delta	9009	22G	ECJL
High Function 12xC13 Single-Phase or Three-Phase Wye PDU plus	9009	22G	ECJN
High Function 12xC13 PDU plus 3-Phase Delta	9009	22G	ECJQ
Cloud Private Solution	9009	22G	ECP0
2.0 Meter Slim Rack	9009	22G	ECR0
Rack Front Door High-End appearance	9009	22G	ECRF
Rack Rear Door Black	9009	22G	ECRG
Rack Side Cover	9009	22G	ECRJ
Rack Rear Extension 5-In	9009	22G	ECRK
Rack Front Door for Rack (Black/Flat)	9009	22G	ECRM
Custom Service Specify, Montpellier, France	9009	22G	ECSF
Custom Service Specify, Mexico	9009	22G	ECSM
Custom Service Specify, Poughkeepsie, USA	9009	22G	ECSP
Integrated Solution Packing	9009	22G	ECSS
Optical wrap Plug	9009	22G	ECW0
1x HW Subscription Increment	9009	22G	EHB1
10x HW Subscription Increment	9009	22G	EHB2
100x HW Subscription Increment	9009	22G	EHB3
SAP HANA TRACKING FEATURE	9009	22G	EHKV
IBM Power Systems for SAS Viya (Linux)	9009	22G	EHLU
IBM Power Systems for SAS 9.4 Grid (AIX)	9009	22G	EHLV
Boot Drive / Load Source in EXP12SX Specify (in #ESLL or #ELLL)	9009	22G	EHR1
Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)	9009	22G	EHR2
SSD Placement Indicator - #ESLS/#ELLS	9009	22G	EHS2
SAS Port/Cabling for single IOA Backplane	9009	22G	EJ00
PCIe3 Optical Cable Adapter for PCIe3 Expansion Drawer	9009	22G	EJ05
PCIe3 RAID SAS Adapter Quad-port 6Gb x8	9009	22G	EJ0J
PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8	9009	22G	EJ0L
PCIe3 LP RAID SAS Adapter Quad-Port 6Gb x8	9009	22G	EJ0M
PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8	9009	22G	EJ10
PCIe3 LP SAS Tape/DVD Adapter Quad-port 6Gb x8	9009	22G	EJ11
PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8	9009	22G	EJ14
Base Storage Backplane 8 SFF-3 Bays	9009	22G	EJ1F
Expanded function Storage Backplane 8 SFF-3 Bays/ Single IOA with write cache	9009	22G	EJ1G
Split #EJ1F to 4+4 SFF-3 Bays: Add 2nd SAS Controller	9009	22G	EJ1H
PCIe1 LP SAS Tape/DVD Dual-port 3Gb x8 Adapter	9009	22G	EJ1N

PCIe1 SAS Tape/DVD Dual-port 3Gb x8 Adapter	9009	22G	EJ1P
PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	9009	22G	EJ1R
PCIe3 Crypto Coprocessor BSC-Gen3 4767	9009	22G	EJ33
Specify Mode-1 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJR1
Specify Mode-1 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJR2
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) X for EXP24S (#5887/EL1S)	9009	22G	EJR3
Specify Mode-2 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJR4
Specify Mode-4 & (4)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJR5
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)	9009	22G	EJR6
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (2) YO for EXP24S (#5887/EL1S)	9009	22G	EJR7
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B & (1) YO for EXP24S (#5887/EL1S)	9009	22G	EJRA
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B & (1) X for EXP24S (#5887/EL1S)	9009	22G	EJRB
Specify Mode-4 & (1)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJRC
Specify Mode-4 & (2)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJRD
Specify Mode-4 & (3)EJ0J/EJ0M/EL3B for EXP24S (#5887/EL1S)	9009	22G	EJRE
Specify Mode-1 & (2)EJ14 for EXP24S (#5887/EL1S)	9009	22G	EJRF
Specify Mode-2 & (2)EJ14 & (2) X for EXP24S (#5887/EL1S)	9009	22G	EJRG
Specify Mode-2 & (2)EJ14 & (1) X for EXP24S (#5887/EL1S)	9009	22G	EJRH
Specify Mode-2 & (4)EJ14 for EXP24S (#5887/EL1S)	9009	22G	EJRJ
Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter	9009	22G	EJRL
Specify Mode-1 & (2)EJ0L for EXP24S (#5887/EL1S)	9009	22G	EJRP
Specify mode-2 & (4) EJ0L for EXP24S #5887/EL1S	9009	22G	EJRR
Specify Mode-2 & (2)EJ0L & (2) X for EXP24S (#5887/EL1S)	9009	22G	EJRS
Specify Mode-2 & (2)EJ0L & (1) X for EXP24S (#5887/EL1S)	9009	22G	EJRT
Non-paired Indicator EJ0L PCIe SAS RAID Adapter	9009	22G	EJRU
Specify Mode-1 & CEC SAS port Controller EJ1G/EL67& (1) 6G YO for EXP24S (#5887/EL1S)	9009	22G	EJSU
Front IBM Bezel for 8-Bay BackPlane	9009	22G	EJU6
Front OEM Bezel for 8-Bay BackPlane	9009	22G	EJU7
Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJV1
Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJV2
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJV3
Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJV4
Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJV5
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJV6
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJV7
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJVA
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJVB
Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJVC
Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJVD
Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP12SX #ESLL/ELLL	9009	22G	EJVE
Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJVF
Specify Mode-1 & (2)EJ0L & (2)YO12 for EXP12SX #ESLL/ELLL	9009	22G	EJVP

Specify Mode-1 & CEC SAS port Controller EJ1G/ EL67 & (1)Y012 for EXP12SX #ESLL/ELLL	9009	22G	EJVU
Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJW1
Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJW2
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJW3
Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJW4
Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJW5
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJW6
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJW7
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJWA
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWB
Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWC
Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWD
Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWE
Specify Mode-1 & (2)EJ14 & (2)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJWF
Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWG
Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWH
Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWJ
Specify Mode-1 & (2)EJ0L & (2)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJWP
Specify Mode-2 & (4)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWR
Specify Mode-2 & (2)EJ0L & (2)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWS
Specify Mode-2 & (2)EJ0L & (1)X12 for EXP24SX #ESLS/ELLS	9009	22G	EJWT
Specify Mode-1 & CEC SAS port Controller EJ1G/ EL67 & (1)Y012 for EXP24SX #ESLS/ELLS	9009	22G	EJWU
PDU Access Cord 0.38m	9009	22G	ELC0
Power Cable - Drawer to IBM PDU (250V/10A)	9009	22G	ELC5
#ESNJ Load Source Specify (283GB HDD SFF-3)	9009	22G	ELUJ
8 GB DDR4 Memory	9009	22G	EM60
16 GB DDR4 Memory	9009	22G	EM62
32 GB DDR4 Memory	9009	22G	EM63
64 GB DDR4 Memory	9009	22G	EM64
128 GB DDR4 Memory	9009	22G	EM65
512GB (16x32GB) Memory DIMMs bundle for EPIC Solution Edition	9009	22G	EM67
PCIe Gen3 I/O Expansion Drawer	9009	22G	EMX0
AC Power Supply Conduit for PCIe3 Expansion Drawer	9009	22G	EMXA
PCIe3 6-slot Fanout Module for PCIe3 Expansion Drawer	9009	22G	EMXF
PCIe3 6-slot Fanout Module for PCIe3 Expansion Drawer	9009	22G	EMXG
PCIe3 6-slot Fanout Module for PCIe3 Expansion Drawer	9009	22G	EMXH
1m (3.3-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9009	22G	EN01
3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9009	22G	EN02
5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9009	22G	EN03
PCIe3 16Gb 2-port Fibre Channel Adapter	9009	22G	EN0A
PCIe3 LP 16Gb 2-port Fibre Channel Adapter	9009	22G	EN0B
PCIe2 LP 8Gb 2-Port Fibre Channel Adapter	9009	22G	EN0F
PCIe2 8Gb 2-Port Fibre Channel Adapter	9009	22G	EN0G
PCIe3 4-port (10Gb FCoE & 1GbE) SR&RJ45	9009	22G	EN0H

PCIe3 LP 4-port (10Gb FCoE & 1GbE) SR&RJ45	9009	22G	EN0J
PCIe3 4-port (10Gb FCoE & 1GbE) SFP+Copper&RJ45	9009	22G	EN0K
PCIe3 LP 4-port(10Gb FCoE & 1GbE) SFP+Copper&RJ45	9009	22G	EN0L
PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter	9009	22G	EN0S
PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter	9009	22G	EN0T
PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter	9009	22G	EN0U
PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter	9009	22G	EN0V
PCIe2 2-port 10/1GbE BaseT RJ45 Adapter	9009	22G	EN0W
PCIe2 LP 2-port 10/1GbE BaseT RJ45 Adapter	9009	22G	EN0X
PCIe2 LP 8Gb 4-port Fibre Channel Adapter	9009	22G	EN0Y
PCIe2 8Gb 4-port Fibre Channel Adapter	9009	22G	EN12
PCIe3 4-port 10GbE SR Adapter	9009	22G	EN15
PCIe3 32Gb 2-port Fibre Channel Adapter	9009	22G	EN1A
PCIe3 LP 32Gb 2-port Fibre Channel Adapter	9009	22G	EN1B
PCIe3 16Gb 4-port Fibre Channel Adapter	9009	22G	EN1C
PCIe3 LP 16Gb 4-port Fibre Channel Adapter	9009	22G	EN1D
Deactivation of LPM (Live Partition Mobility)	9009	22G	EPA0
Horizontal PDU Mounting Hardware	9009	22G	EPTH
High Function 9xC19 PDU: Switched, Monitoring	9009	22G	EPTJ
High Function 9xC19 PDU 3-Phase: Switched, Monitoring	9009	22G	EPTL
High Function 12xC13 PDU: Switched, Monitoring	9009	22G	EPTN
High Function 12xC13 PDU 3-Phase: Switched, Monitoring	9009	22G	EPTQ
Quantity 150 of #ES62 3.86-4.0 TB 7200 rpm 4k LFF-1 Disk	9009	22G	EQ62
Quantity 150 of #ES64 7.72-8.0 TB 7200 rpm 4k LFF-1 Disk	9009	22G	EQ64
Quantity 150 of #ES78 387GB SFF-2 SSD 5xx	9009	22G	EQ78
Quantity 150 of #ES7E 775GB SFF-2 SSD 5xx	9009	22G	EQ7E
Quantity 150 of #ES80 1.9TB SFF-2 SSD 4k	9009	22G	EQ80
Quantity 150 of #ES85 387GB SFF-2 SSD 4k	9009	22G	EQ85
Quantity 150 of #ES8C 775GB SFF-2 SSD 4k	9009	22G	EQ8C
Quantity 150 of #ES8F 1.55TB SFF-2 SSD 4k	9009	22G	EQ8F
Quantity 150 of #ES8Y 931GB SFF-2 SSD 4k	9009	22G	EQ8Y
Quantity 150 of ES96 1.86TB SFF-2 SSD 4k	9009	22G	EQ96
Quantity 150 of #ESE7 3.72TB SFF-2 SSD 4k	9009	22G	EQE7
Quantity 150 of #ESEV (600GB 10k SFF-2)	9009	22G	EQEV
Quantity 150 of #ESEZ (300GB SFF-2)	9009	22G	EQEZ
Quantity 150 of #ESF3 (1.2TB 10k SFF-2)	9009	22G	EQF3
Quantity 150 of #ESFP (600GB SFF-2)	9009	22G	EQFP
Quantity 150 of #ESFT (1.8TB 10k SFF-2)	9009	22G	EQFT
Quantity 150 of #ESG5 (387GB SAS 5xx)	9009	22G	EQG5
Quantity 150 of #ESGB (387GB SAS 4k)	9009	22G	EQGB
Quantity 150 of #ESGF (775GB SAS 5xx)	9009	22G	EQGF
Quantity 150 of #ESGK (775GB SAS 4k)	9009	22G	EQGK
Quantity 150 of #ESGP (1.55TB SAS 4k)	9009	22G	EQGP
Quantity 150 of ES94 387GB SAS 4k	9009	22G	ER94
Bulk Packaging Request ID	9009	22G	ERB0
Bulk Packaging ID #1	9009	22G	ERB1
Bulk Packaging ID #2	9009	22G	ERB2
Bulk Packaging ID #3	9009	22G	ERB3
Bulk Packaging ID #4	9009	22G	ERB4
Bulk Packaging ID #5	9009	22G	ERB5
Bulk Packaging ID #6	9009	22G	ERB6
Bulk Packaging ID #7	9009	22G	ERB7
Bulk Packaging ID #8	9009	22G	ERB8
Bulk Packaging ID #9	9009	22G	ERB9
Bulk Packaging ID #10	9009	22G	ERBA
Bulk Packaging ID #11	9009	22G	ERBB
Bulk Packaging ID #12	9009	22G	ERBC
Bulk Packaging ID #13	9009	22G	ERBD
Bulk Packaging ID #14	9009	22G	ERBE
Bulk Packaging ID #15	9009	22G	ERBF
Bulk Packaging ID #16	9009	22G	ERBG
Bulk Packaging ID #17	9009	22G	ERBH
Bulk Packaging ID #18	9009	22G	ERBJ
Bulk Packaging ID #19	9009	22G	ERBK
Bulk Packaging ID #20	9009	22G	ERBL
No Bulk Packaging Specify	9009	22G	ERBZ
RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs	9009	22G	ERF1

Rear rack extension	9009	22G	ERG0
Quantity 150 of ESGV 387GB SSD 4k	9009	22G	ERGV
Quantity 150 of ESGZ 775GB SSD 4k	9009	22G	ERGZ
Quantity 150 of #ESHJ 931 GB SSD 4k SFF-2	9009	22G	ERHJ
Quantity 150 of #ESHL 1.86 TB SSD 4k SFF-2	9009	22G	ERHL
Quantity 150 of #ESHN 7.45 TB SSD 4k SFF-2	9009	22G	ERHN
Quantity 150 of ESJ0 931GB SAS 4k	9009	22G	ERJ0
Quantity 150 of ESJ2 1.86TB SAS 4k	9009	22G	ERJ2
Quantity 150 of ESJ4 3.72TB SAS 4k	9009	22G	ERJ4
Quantity 150 of ESJ6 7.45TB SAS 4k	9009	22G	ERJ6
Quantity 150 of #ESM8 3.72 TB SSD 4k SFF-2	9009	22G	ERM8
Quantity 150 of ESNA 775GB SSD 4k	9009	22G	ERNA
Quantity 150 of ESNE 1.55TB SSD 4k	9009	22G	ERNE
3.86-4.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)	9009	22G	ES62
7.72-8.0 TB 7200 RPM 4K SAS LFF-1 Nearline Disk Drive (AIX/Linux)	9009	22G	ES64
387GB SFF-2 SSD 5xx eMLC4 for AIX/Linux	9009	22G	ES78
775GB SFF-2 SSD 5xx eMLC4 for AIX/Linux	9009	22G	ES7E
387GB SFF-3 SSD 5xx eMLC4 for AIX/Linux	9009	22G	ES7K
775GB SFF-3 SSD 5xx eMLC4 for AIX/Linux	9009	22G	ES7P
1.9TB Read Intensive SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ES80
931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ES83
387GB SFF-2 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES85
775GB SFF-2 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES8C
1.55TB SFF-2 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES8F
1.9TB Read Intensive SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ES8J
387GB SFF-3 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES8N
775GB SFF-3 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES8Q
1.55TB SFF-3 SSD 4k eMLC4 for AIX/Linux	9009	22G	ES8V
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ES8Y
387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ES90
1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ES92
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ES94
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ES96
387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESB0
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESB2
775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESB4
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESB6
387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESB8
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESBA
775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESBE
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESBG
1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESBJ
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESBL
S&H - No Charge	9009	22G	ESC0
S&H-a	9009	22G	ESC5
600GB 10K RPM SAS SFF-3 Disk Drive (AIX/Linux)	9009	22G	ESD5
300GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)	9009	22G	ESDB
3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESE1
3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESE7
600GB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096	9009	22G	ESEV
300GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive	9009	22G	ESEZ
1.2TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096	9009	22G	ESF3
600GB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096	9009	22G	ESF5
1.2TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096	9009	22G	ESF9
300GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive	9009	22G	ESFB
600GB 15K RPM SAS SFF-3 4K Block - 4096 Disk Drive	9009	22G	ESFF
600GB 15K RPM SAS SFF-2 4K Block - 4096 Disk Drive	9009	22G	ESFP
1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096	9009	22G	ESFT
1.8TB 10K RPM SAS SFF-3 Disk Drive 4K Block - 4096	9009	22G	ESFV
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESG5

387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESG9
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESGB
387GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESGD
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESGF
775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESGH
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESGK
775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESGM
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESGP
1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESGR
387GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESGT
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESGV
775GB Enterprise SAS 5xx SFF-3 SSD for AIX/Linux	9009	22G	ESGX
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9009	22G	ESGZ
931 GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESHJ
1.86 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESHL
7.45 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESHN
931 GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESHS
1.86 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESHU
7.45 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESHW
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESJ0
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESJ2
3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESJ4
7.45TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESJ6
931GB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESJ8
1.86TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESJA
3.72TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESJC
7.45TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESJE
Specify AC Power Supply for EXP12SX/EXP24SX			
Storage Enclosure	9009	22G	ESLA
EXP12SX SAS Storage Enclosure	9009	22G	ESLL
EXP24SX SAS Storage Enclosure	9009	22G	ESLS
3.72 TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESM8
3.72 TB Mainstream SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESMQ
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESNA
775GB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESNC
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9009	22G	ESNE
1.55TB Enterprise SAS 4k SFF-3 SSD for AIX/Linux	9009	22G	ESNG
283GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (IBM i)	9009	22G	ESNJ
300GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/Linux)	9009	22G	ESNK
300GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)	9009	22G	ESNM
600GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (AIX/Linux)	9009	22G	ESNP
600GB 15K RPM SAS SFF-2 4k Block Cached Disk Drive (AIX/Linux)	9009	22G	ESNR
Quantity 150 of #ESNM (300GB 15k SFF-2)	9009	22G	ESPM
Quantity 150 of #ESNR (600GB 15k SFF-2)	9009	22G	ESPR
Quantity 150 of ESB2 387GB SAS 4k	9009	22G	ESQ2
Quantity 150 of ESB6 775GB SAS 4k	9009	22G	ESQ6
Quantity 150 of ESBA 387GB SAS 4k	9009	22G	ESQA
Quantity 150 of ESBG 775GB SAS 4k	9009	22G	ESQG
Quantity 150 of ESBL 1.55TB SAS 4k	9009	22G	ESQL
1TB Removable Disk Drive Cartridge	9009	22G	EU01
Not available in US, EMEA, and Japan			
RDX USB External Docking Station for Removable Disk Cartridge	9009	22G	EU04
RDX 320 GB Removable Disk Drive	9009	22G	EU08
Operator Panel LCD Display	9009	22G	EU0B
1.5TB Removable Disk Drive Cartridge	9009	22G	EU15
Cable Ties & Labels	9009	22G	EU19
Order Placed Indicator	9009	22G	EU29
2TB Removable Disk Drive Cartridge (RDX)	9009	22G	EU2T
RDX USB External Docking Station	9009	22G	EUA4
Standalone USB DVD drive w/cable	9009	22G	EUA5
Core Use HW Feature	9009	22G	EUC6
Core Use HW Feature 10X	9009	22G	EUC7
BP Post-Sale Services: 1 Day	9009	22G	SVBP
IBM Systems Lab Services Post-Sale Services: 1 Day	9009	22G	SVCS

other IBM Post-Sale Services: 1 Day 9009 22G SVNN

The following are newly announced features on the specific models of the IBM Power Systems 7014 and 7965 machine type:

Planned Availability Date July 24, 2020

New Feature

Description	Machine type	Model number	Feature number
Rack Content Specify: 9009-22G - 2EIA	7014	T00	ER33
	7014	T42	
	7965	S42	

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBMid).

[BP Attachment for Announcement Letter 120-025](#)

Publications

Publications:

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

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

You can access the product documentation at [IBM Knowledge Center](#).

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

The following information is shipped with the 9009-22G:

- Power Hardware Information DVD SK5T-7087
- Installing the 9009-22G
- Important Notices
- Warranty Information
- License Agreement for Machine Code

Hardware documentation such as installation instructions, user's information, and service information is available to download or view at the [IBM Support](#) website.

You can access IBM i documentation at the [IBM](#) website.

You can access AIX documentation at the [AIX](#) website.

You can access documentation about Linux on IBM systems at the [Linux information for IBM systems](#) website.

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IBM Knowledge Center provides you with a single point of reference 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 by going to [IBM Knowledge Center](#) for all your product information needs.

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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.

Services

IBM Systems Lab Services

IBM Systems Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Systems Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Systems Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the [IBM Systems Lab Services](#) website.

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or go to the [IBM Global Technology Services](#) website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the [Resiliency Services](#) website.

Details on education offerings related to specific products can be found on the [IBM Skills Gateway](#) website.

Technical information

Specified operating environment

Physical specifications

- Width: 482 mm (18.97 in.)
- Depth: 766.5 mm (30.2 in.)
- Height: 86.7 mm (3.4 in.)
- Weight: 30.4 kg (67 lb)

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

Operating environment

- Temperature: (nonoperating) 5 to 45 degrees Celsius (41 to 113 Fahrenheit); recommended temperature (operating) 18 to 27 degrees Celsius (64 to 80 Fahrenheit); allowable operating temperature 5 to 40 degrees Celsius (41 to 104 Fahrenheit)
- Relative humidity: 8% - 85% (allowable operating humidity range); recommended 5.5 degrees Celsius (42 Fahrenheit) dew point to 60% RH and 15 degrees Celsius (59 Fahrenheit) dew point
- Maximum dew point: 24 degrees C (75 Fahrenheit) (allowable operating)
- Operating voltage: 1400 W PSU: 200 - 240 V AC
- Operating frequency: 47/63 Hz
- Maximum power consumption: 1880 watts (maximum)
- Power factor: 0.98
- Thermal output: 6,416 Btu/hour (maximum)
- Power-source loading
 - 1.94 kVa (maximum configuration)
 - Maximum altitude: 3,050 m (10,000 ft)

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

Noise levels and declared A-weighted sound power level

- Rack-mount system: 6.5 bels operating; 5.3 bels idling

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

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

- Enablement of the Turbo mode increases fan speed, which increases power noise levels.
- Usage of the Turbo mode further increases fan speed, which further increases power noise levels.
- Using higher wattage PCIe adapters increases fan speed, which increases power noise levels.
- Placing multiple servers in a rack increases the total power noise level.
- Placing servers in racks with acoustic doors reduces the power noise levels.

EMC conformance classification

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

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

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

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

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

Product safety/Country testing/Certification

- UL 60950-1:2007 Underwriters Laboratory, Safety Information
- CSA C22.2 No. 60950-1-07, Canadian Standards Association
- EN60950 European Norm
- IEC 60950, Edition 1, International Electrotechnical Commission, Safety Information
- Nordic deviations to IEC 60950-1 1st Edition

General requirements:

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

Homologation

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

Hardware requirements

Power S922 system configuration

The minimum Power S922 initial order must include a processor module, two 16 GB DIMMs, 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 the storage options and the network options below:

Storage options:

- For boot from NVMe: One NVMe drive slot and one NVMe drive or one PCIe NVMe add in adapter .
- For boot from direct attach storage SFF-3 / SFF-2 HDD/SSD: One storage backplane and one SFF-3 / SFF-2 HDD or SSD.
- For boot from SAN: Internal HDD or SSD and RAID card are not required if feature 0837 (Boot from SAN) is selected. A Fibre Channel 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

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

Feature number	Description	Quantity	Notes
EU0B	Operator Panel LCD Display	1	Optional
Processors			
EP56	4-core typical 2.8 to 3.8 GHz (max) POWER9 Processor	1	
or			
EP58	8-core typical 3.4 to 3.9 GHz (max) POWER9 Processor	1	
or			
EP59	10-core typical 2.9 to 3.8 GHz (max) POWER9 Processor	1	
or			
EP5B	11-core Typical 2.8 to 3.8 Ghz (max) POWER9 Processor	1	
Processor activations			
EP66	One Processor Core Activation for #EP56	4	
or			
EP68	One Processor Core Activation for #EP58	8	
or			
EP69	One Processor Core Activation for #EP59	10	
or			
EP6B	One Processor Core Activation for #EP5B	11	
Memory DIMMs			
EM62	16 GB DDR4 Memory	2	
or			
EM63	32 GB DDR4 Memory	2	
or			
EM64	64 GB DDR4 Memory	2	
or			
EM65	128 GB DDR4 Memory	2	
Storage Backplane			
EJ1V	Storage Backplane with 2 PCIe Gen4 capable NVMe U.2 drive slots	1	See Note 2 and Note 4

Feature number	Description	Quantity	Notes
or			
EJ1W	Storage Backplane with 4 PCIe Gen4 capable NVMe U.2 drive slots	1	See Note 2 and Note 4
Disk Drive			
ESDB	300 GB 15K RPM SAS SFF-3 Disk Drive (AIX/Linux)	1	
LAN Adapter			
5260	PCIe2 LP 4-port 1 GbE Adapter	1	See Note 3
Power supplies/ Power cord			
EB2M	AC Power Supply - 1400 W for Server (200 - 240 V AC)	2	EB2M -(default)
6458	Power Cord 4.3 m (14 ft), Drawer to IBM PDU (250V/10A)	2	6458 - (default)
9300/97xx	Language Group Specify		9300 - (default)
Front Bezel			
EJUN	Front IBM Bezel for 4 NVMe-Bay BackPlane	1	
or			
EJUP	Front OEM Bezel for 4 NVMe-Bays BackPlane	1	
Primary Operating System			
2146	Primary Operating System Indicator - AIX	1	
or			
2147	Primary Operating System Indicator - Linux	1	
or			
2148	IBM i with VIOS Only System Indicator	1	

1. The racking approach for the initial order must be either a 7014-T00, 7014-T42, 7965-S42, or 7953-94Y. If an additional rack is required for I/O expansion drawers as an MES to an existing system, either a feature 0551, 0553, or ER05 rack must be ordered.
2. Must order, at a minimum, one #ES1E/#ES1G/#EC5V/#EC5X (NVMe U.2 drive) with backplane #EJ1V, or #EJ1W. Maximum of two #ES1E/#ES1G/#EC5V/#EC5X per one #EJ1V. Maximum of four #ES1E/#ES1G/#EC5V/#EC5X per one #EJ1W. Mixing of #ES1E, #ES1G, #EC5V, or #EC5X is allowed on a backplane.
3. Adapter feature 5260 is the default 1 Gb Ethernet adapter. Options of a 10 Gb Ethernet adapter include one of either #EC2R, #EC2T, #EN0J, #EN0L, #EN0T, #EN0X, or EN0V.
4. Storage backplane features EJ1F, EJ1G, and EJ1H are also available (selected Front Bezel are required).

IBM i is the primary operating system. The minimum defined initial order configuration is as follows:

Feature number	Description	Quantity	Notes
EU0B	Operator Panel LCD Display	1	
Processors			
EP5Y	1-core Typical 2.8 to 3.8 Ghz (max) POWER9 Processor	1	
Processor activations			
EP6Y	One Processor Core Activation for #EP5Y	1	
Power Virtualization			
EEPY	IBM i Enablement for processor EP5Y	1	
Memory DIMMs			
EM62	16 GB DDR4 Memory	2	
Storage Backplane			
EJ1F	Base Storage Backplane 8 SFF-3 Bays	1	Optional #EJ1H - Split #EJ1F to 4+4 SFF-3 bays: Add 2nd SAS controller. See Note 4 and Note 5.
Disk Drive			
ESNJ	283GB 15K RPM SAS SFF-3 4k Block Cached Disk Drive (IBM i)	2	See Note 1 and Note 4
LAN Adapter			
5260	PCIe2 LP 4-port 1 GbE Adapter	1	See Note 3
Power supplies/ Power cord			
EB2M	AC Power Supply - 1400 W for Server (200 - 240 V AC)	2	EB2M -(default)
6458	Power Cord 4.3 m (14 ft), Drawer to IBM PDU (250V/10A)	2	6458 - (default)
9300/97xx	Language Group Specify		9300 - (default)
Front Bezel			
EJU6	Front IBM Bezel for 8-Bay BackPlane	1	
Primary Operating System Indicator			
2145	Primary Operating System Indicator - IBM i	1	IBM i OS Indicator #EB72 or #EB73 or #EB74 is required.

1. Other SFF-3 drives are not supported. The 1-core Power S922 server has eight PCIe Gen4 slots. One slot is used by one 4-port 1 Gb Ethernet adapter.
2. The CBU specify feature (#0444) is supported with the 1-core processor card (#EP5Y) in IBM i environments. With its P05 software, it can be paired with a POWER8^(R) or POWER9 server with P05 or P10 software tier.

3. The PCIe expansion drawer (#EMX0) and EXP24SX /EXP12SX SAS storage enclosures (#ESLS or #ESLL) do not apply to the 1-core configuration Power S922 server.
4. IBM i operating system performance: Clients with write-sensitive disk/HDD workloads should upgrade from the feature EJ1F/EJ1H base storage backplane to use NVMe devices with the features EJ1V/EJ1W Storage Backplane with PCIe Gen4 capable NVMe to gain the performance advantage of NVMe.
5. Storage backplane features EJ1G, EJ1V, and EJ1W are also available (selected Front Bezel are required).

Hardware Management Console (HMC) machine code

An HMC is required to manage the Power S922 server implementing partitioning. Multiple POWER7^(R), POWER8, and POWER9 processor-based servers can be supported by a single HMC.

Planned HMC hardware and software support:

- X86 based - 7042-CR7, 7042-CR8, 7042-CR9
 - vHMC x86
- POWER8 based Open Power: 7063-CR1
 - vHMC 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 [Fix Level Recommendation Tool](#) website.

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

The HMC code latest level contains the following:

- Support for managing Power S922, Power S924, and Power S914 systems.
- Support for the new HMC model 7063-CR1.
- Support for PowerVM functions such as the new HMC GUI interface for VIOS management.
- GUI for HMC's Performance and Capacity Monitoring function.
- An HMC command to initiate a remote restart operation. This removes the requirement of VMControl for the PowerVM Remote Restart function.
- For PowerVM GUI functions, VIOS is recommended.

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 Knowledge Center](#). In situations where IBM service is required and the recommended tools are not available, there could be delays in repair actions.

Software requirements

If installing the Linux operating system LPAR:

- Red Hat Enterprise Linux 8 for Power LE, version 8.1, or later
- SUSE Linux Enterprise Server 15 Service Pack 1, or later

If installing the Linux operating systems LPAR in nonproduction SAP implementations:

- SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 1, or later
- Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8 for Power LE version 8.1, or later

If installing IBM i:

- On the 8-, 10-, or 11-core processors (#EP58, #EP59, #EP5B) VIOS is required and the IBM i operating system levels supported are:
 - IBM i 7.4 TR2, or later
 - IBM i 7.3 TR8, or later
 - IBM i 7.2 with 7.2 Licensed Machine Code - RS 720-Q, or later
- On the 1-core processor (#EP5Y), VIOS is not supported and the IBM i operating system levels supported are:
 - IBM i 7.4 TR2, or later
 - IBM i 7.3 TR8, or later
 - IBM i 7.2 with 7.2 Licensed Machine Code - RS 720-Q, or later

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

- AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-02-2028, or later
- AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-06-2028, or later
- AIX Version 7.2 with the 7200-03 Technology Level and Service Pack 7 (planned availability February 19, 2021)

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

- AIX Version 7.2 with the 7200-04 Technology Level, or later
- AIX Version 7.2 with the 7200-03 Technology Level, or later
- AIX Version 7.2 with the 7200-02 Technology Level and Service Pack 7200-02-02-1832, or later
- AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-02-1832, or later

If installing VIOS:

- VIOS 3.1.1.25, or later
- VIOS 2.2.6.65, or later

Limitations

- Integrated system port is not supported under AIX or Linux when the HMC ports are connected to an HMC. Either the HMC ports or the integrated system ports can be used, but not both. The FSP2 USB 2.0 port is used for communication to a UPS.
- The integrated system port is supported for modem and TTY terminal connections by AIX or Linux. Any other application using serial ports requires a serial port adapter to be installed in a PCI slot. The integrated system port does not support HACMP configurations.
- PowerVM virtualization and VM Recovery Manager are not included in 1-core processor (#EP5Y) configurations. HMC or vHMC is not required with the Power S922 1-core processor configuration (#EP5Y). Given the S922 1-core processor

has only one partition and no virtualization, its value would be limited. An HMC or vHMC could be used for things like remote console support, additional diagnostic tooling, remote set and management, update access key for firmware and more.

Boot requirements for 8-core, 10-core, and 11-core configurations

- IBM i Operating System indicator (#2145) not allowed.

Boot requirements for 1-core processor configuration

- 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 specify codes must also be selected:
 - #0837 SAN Operating System Load Source Specify
- If IBM i (#2145) is selected, one of the following system console specify codes must be selected:
 - #5550 -- System Console on HMC
 - #5557 -- System Console - Internal LAN

Planning information

Cable orders

No additional cables are required.

Security, auditability, and control

This product uses the security and auditability features of host hardware and application software.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

IBM Systems Lab Services

For details on available services, contact your IBM representative or go to the [IBM Systems Lab Services](#) website.

Terms and conditions

Volume orders

Contact your IBM representative.

IBM Global Financing

Yes

Products - terms and conditions

Warranty period

Warranty and additional coverage options:	Coverage summary⁽¹⁾:
Warranty Period:	3 years

Warranty and additional coverage options:	Coverage summary⁽¹⁾:
Service Level:	IBM CRU & On-Site, 9x5 Next Business Day
Service Upgrade Options :	
Warranty Service Upgrade	IBM On-Site Repair, 9x5 Same Day ⁽²⁾ and 24x7 Same Day options
Maintenance Services (Post-Warranty):	IBM On-Site Repair, Next Business Day and Same Day options
IBM Hardware Maintenance Services - committed maintenance ⁽³⁾ :	Y

⁽¹⁾ See complete coverage details below.

⁽²⁾ Offered in US and EMEA only.

⁽³⁾ Not offered in the US.

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

IBM Solid State Drive (SSD) and Non-Volatile Memory Express (NVMe) devices identified in this document may have a maximum number of write cycles. IBM SDD and NMVe 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.

The IBM warranty covers feature number EB4Z. For warranty terms associated with feature number EB3Z and the Lift tool based on GenieLift GL-8, see the separate warranty terms provided by Genie found in the Genie Operator's Manual at the [Genie](#) website.

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 Knowledge Center](#). In situations where IBM service is required and the recommended tools are not available, there could be delays in repair actions.

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically through an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional

charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information.

CRU Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

Tier 1 (mandatory) CRU

Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

The following parts have been designated as Tier 1 CRUs:

- DASD SFF Drive
- DASD SSD Drive
- RDX Drive
- Enclosure
- Power Cable
- NVMe U.2
- SAS Card
- Op Panel -- Base
- Op Panel -- LCD
- Memory DIMM
- All PCI Adapters
- FAN
- Upper Fan cable
- TPM Card
- Power Supplies
- Service Processor Card/FSP
- TOD Battery
- Air Baffle
- Bezel
- SAS Cable
- Front Heatsink
- Service Cover
- DASD Backplane Power Cable
- DASD Backplane Signal Cable

Tier 2 (optional) CRU

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next-business-day (NBD) delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU. You may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

CRU and On-site Service

At IBM's discretion, you will receive specified CRU service, or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Service level is:

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response. Calls must be received by 3:00 PM local time in order to qualify for next-business-day response.

Warranty service

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

International Warranty Service

International Warranty Service allows you to relocate any machine that is eligible for International Warranty Service and receive continued warranty service in any country where the IBM machine is serviced. If you move your machine to a different country, you are required to report the machine information to your Business Partner or IBM representative.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased. Warranty service will be provided with the prevailing warranty service type and service level available for the eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

The following types of information can be found on the [International Warranty Service](#) website

- Machine warranty entitlement and eligibility
- Directory of contacts by country with technical support contact information
- Announcement Letters

Warranty service upgrades

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

Maintenance service options

CRU and On-site Service

At IBM's discretion, you will receive CRU service or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. The following on-site response-time objectives are available as warranty service upgrades for your machine. Available offerings are:

- On-Site Repair, Monday through Friday (excluding holidays), 8 AM to 5 PM, 4-hour on-site response objective. Response times are objectives and are not guaranteed
- On-Site Repair, 7 days a week, 24hrs/day.
- On-Site Repair, 7 days a week, 24hrs/day, 2-hour response objective. Response times are objectives and are not guaranteed.

Customer Replaceable Units (CRUs) may be provided as part of the machine's standard warranty CRU Service except that you may install a CRU yourself or request IBM installation, at no additional charge, under the CRU and On-site Service level specified above. For additional information on the CRU Service, see the warranty information.

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, through an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information.

The following service selections are available as maintenance options, at additional cost, for your machine type.

- On-Site Repair, Monday through Friday (excluding holidays), 8 AM to 5 PM, next business day.
- On-Site Repair, Monday through Friday (excluding holidays), 8 AM to 5 PM, 4-hour response objective. Response times are objectives and are not guaranteed.
- On-Site Repair, 7 days a week, 24hrs/day.
- On-Site Repair, 7 days a week, 24hrs/day, 2-hour response objective. Response times are objectives and are not guaranteed.

On-site Service

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Customer Replaceable Unit (CRU) Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

CRUs will be shipped based upon availability. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

Tier 1 (mandatory) CRUs: Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

For machines with On-site Same-day Response Service, IBM will replace a Tier 1 CRU part at your request, at no additional charge.

The following parts have been designated as Tier 1 CRUs:

- DASD SFF Drive
- DASD SSD Drive
- NVMe U.2
- SAS Card
- Op Panel -- Base
- Op Panel -- LCD
- Memory DIMM
- All PCI Adapters
- FAN
- TPM Card
- Power Supplies
- Service Processor Card/FSP
- TOD Battery
- Air Baffles
- Bezel
- SAS Cable Front
- Heatsink
- Service Cover
- DASD Backplane Power Cable
- DASD Backplane Signal Cable

Tier 2 (optional) CRUs: You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Additional reference for Europe

The following European documents can be found on the [IBM Maintenance and Technical Support Services](#) website.

- European Announcement Letter ZS03-0150 for IBM Customer Agreement (ICA)
- European Announcement Letter ZS04-0135 for Enterprise Agreement Contract
- European Announcement Letter ZS98-0118 for ServiceSuite Contract

Non-IBM parts service

Under certain conditions, IBM provides services for selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

This service includes hardware problem determination (PD) on the non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM machines and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

Usage plan machine

No

IBM hourly service rate classification

Two

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

General terms and conditions

Field-installable features

Yes

Model conversions

No

Machine installation

Client setup. Clients are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply

Yes

The applicable processor group is: Small

Licensed Machine Code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative. It can also be found on the [License Agreement for Machine Code and Licensed Internal Code](#) website.

Machine using LMC Type Model 9009-22G

Access to 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 in its discretion.

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

Educational allowance

A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

The educational allowance is 8% for the products in this announcement.

Prices

For additional information and current prices, contact your local IBM representative or IBM Business Partner.

Product charges

The following are newly announced features on the specific models of the IBM Power Systems 9009 machine type:

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. charge	Initial/MES/Both/support	RP CSU	MES
IBM Power System S922	22G						Yes
One CSC Billing Unit	22G	0010			Both	Yes	No
Ten CSC Billing Units	22G	0011			Both	Yes	No
Mirrored System Disk Level, Sp	22G	0040			Initial	Yes	No
Device Parity Protection All	22G	0041			Initial	Yes	No
Device Parity RAID 6 All	22G	0047			Initial	Yes	No
RISC to RISC Data Migration	22G	0205			Initial	N/A	No
AIX Partition Specify	22G	0265			Both	Yes	No
Linux Partition Specify	22G	0266			Both	Yes	No
IBM i Partition Specify	22G	0267			Both	Yes	No
Mirrored Level System Specify	22G	0308			Initial	Yes	No
V.24/EIA232 6.1m (20 Ft) PCI C	22G	0348			Both	Yes	No
V.35 6.1m (20 Ft) PCI Cable	22G	0353			Both	Yes	No
X.21 6.1m (20 Ft) PCI Cable	22G	0359			Both	Yes	No
CBU Specify	22G	0444			Initial	N/A	No
Customer Specified Placement	22G	0456			Initial	N/A	No
19 inch, 1.8 meter high rack	22G	0551			MES	Yes	No
19 inch, 2.0 meter high rack	22G	0553			MES	Yes	No
Rack Filler Panel Kit	22G	0599			Both	Yes	No
Load Source Not in CEC	22G	0719			Both	Yes	No
5887/EL1S Load Source Specify	22G	0728			MES	Yes	No
SAN Load Source Specify	22G	0837			Both	Yes	No
US TAA Compliance Indicator	22G	0983			Both	Yes	No
Asm in USA manufacturing plant	22G	0984			Both	Yes	No

Modem Cable US/Canada and GU	22G	1025	Both	Yes	No
USB 500 GB Removable Disk Dr	22G	1107	Both	Yes	No
Custom Serv. Specify, Roch	22G	1140	Both	Yes	No
Quantity 150 of #1964	22G	1818	Both	Yes	No
Quantity 150 of #1953	22G	1929	Both	Yes	No
300GB 15k RPM SAS SFF-2 Disk	22G	1953	Both	Yes	No
600GB 10k RPM SAS SFF-2 Disk	22G	1964	Both	Yes	No
Primary OS - IBM i	22G	2145	Initial	N/A	No
Primary OS AIX	22G	2146	Both	Yes	No
Primary OS Linux	22G	2147	Both	Yes	No
IBM i with VIOS Only Ind.	22G	2148	Both	Yes	No
Factory Deconfiguration of 1 c	22G	2319	Initial	N/A	No
LC-SC 50 Micron Fiber Conv Cab	22G	2456	Both	Yes	No
LC-SC 62.5 Mic.Fib.Conv.Cable	22G	2459	Both	Yes	No
Asynch.Termin/Print.Cbl EIA232	22G	2934	Both	Yes	No
Asynchronous Cable EIA 232/V	22G	2936	Both	Yes	No
Ser to Ser Port Cab Draw/Draw	22G	3124	Both	Yes	No
Serial to Se.Port Cbl Rack 8M	22G	3125	Both	Yes	No
Widescreen LCD Monitor	22G	3632	Support	Yes	No
0.3M Serial Prt Converter Cbl	22G	3925	Both	Yes	No
Serial Port Null Mod Cab 3.7M	22G	3927	Both	Yes	No
Ser.Port Null Modem Cable,10M	22G	3928	Both	Yes	No
System Serial Port Converter C	22G	3930	Both	Yes	No
6Foot Extend.Cbl for Displays	22G	4242	Support	Yes	No
Extender Cable USB Keybo 1.8M	22G	4256	Both	Yes	No
VGA to DVI Connection Converter	22G	4276	Both	Yes	No
Rack Integration Services	22G	4649	Initial	N/A	No
One and only one rack indicator feature is required on all orders (#4650 to #4666).					
No Factory Integration Ind.	22G	4650	Initial	N/A	No
Rack Indicator, Rack 1	22G	4651	Initial	N/A	No
Rack Indicator, Rack 2	22G	4652	Initial	N/A	No
Rack Indicator, Rack 3	22G	4653	Initial	N/A	No
Rack Indicator, Rack 4	22G	4654	Initial	N/A	No
Rack Indicator, Rack 5	22G	4655	Initial	N/A	No
Rack Indicator, Rack 6	22G	4656	Initial	N/A	No
Rack Indicator, Rack 7	22G	4657	Initial	N/A	No
Rack Indicator, Rack 8	22G	4658	Initial	N/A	No

Rack Indicator, Rack 9	22G	4659	Initial	N/A	No
Rack Indicator, Rack 10	22G	4660	Initial	N/A	No
Rack Indicator, Rack 11	22G	4661	Initial	N/A	No
Rack Indicator, Rack 12	22G	4662	Initial	N/A	No
Rack Indicator, Rack 13	22G	4663	Initial	N/A	No
Rack Indicator, Rack 14	22G	4664	Initial	N/A	No
Rack Indicator, Rack 15	22G	4665	Initial	N/A	No
Rack Indicator, Rack 16	22G	4666	Initial	N/A	No
Power Active Memory Expansion	22G	4793	Both	Yes	No
Software Preload Required	22G	5000	Initial	N/A	No
PowerVM Enterprise Edition	22G	5228	Both	Yes	No
PCIe2 LP 4-port 1GbE Adapter	22G	5260	Both	Yes	No
PCIe LP POWER GXT145 Graphics	22G	5269	Both	Yes	No
PCIe LP 8Gb 2 Port Fibre Chann	22G	5273	Support	Yes	No
Sys Console On HMC	22G	5550	Initial	N/A	No
Sys Console-Ethernet LAN	22G	5557	Initial	N/A	No
PCIe2 8Gb 4-port Fibre Channel	22G	5729	Support	Yes	No
8 Gigabit PCI Express Dual Por	22G	5735	Support	Yes	No
4 Port Async EIA 232 PCIe Adap	22G	5785	Support	Yes	No
EXP24S SFF Gen2-bay Drawer	22G	5887	Support	Yes	No
PCIe2 4-port 1GbE Adapter	22G	5899	Both	Yes	No
Opt Front Door for 1.8m Rack	22G	6068	MES	Yes	No
Opt Front Door for 2.0m Rack	22G	6069	MES	Yes	No
1.8m Rack Acoustic Doors	22G	6248	MES	Yes	No
2.0m Rack Acoustic Doors	22G	6249	MES	Yes	No
1.8m Rack Trim Kit	22G	6263	MES	Yes	No
2.0m Rack Trim Kit	22G	6272	MES	Yes	No
Pwr Crd 4.3m 14ft to IBM PDU	22G	6458	Both	Yes	No
Pwr Crd (14FT), Drwr - OEM PDU	22G	6460	Both	Yes	No
Pwr Crd 4.3m 14ft wall OEM PDU	22G	6469	Both	Yes	No
Pwr Crd 1.8m 6ft wall 125V/15A	22G	6470	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6471	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6472	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6473	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6474	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6475	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	22G	6476	Both	Yes	No

Pwr Crd 2.7m 9ft wall OEM PDU 22G	6477	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU 22G	6478	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU 22G	6488	Both	Yes	No
4.3m 14 Ft 3PH/32A Pwr Cord 22G	6489	Both	Yes	No
4.3m (14 Ft) 1PH/63A Pwr Cord 22G	6491	Both	Yes	No
4.3m (14 Ft) 1PH/48A PwrCord 22G	6492	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU 22G	6493	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU 22G	6494	Both	Yes	No
Pwr Crd 2.7m 9ft wall 250V,10A 22G	6496	Both	Yes	No
Power Cable Drawer to IBM PD 22G	6577	Both	Yes	No
Optional Rack Security Kit 22G	6580	MES	Yes	No
Pwr Crd 2.7m 9ft wall 125V,15A 22G	6651	Both	Yes	No
4.3m 3PH/16A Power Cord 22G	6653	Both	Yes	No
4.3m 1PH/24A Pwr Cord 22G	6654	Both	Yes	No
4.3m 14Ft 1PH/24A WR Pwr 22G	6655	Both	Yes	No
4.3m 14Ft 1PH/32A Power Cord 22G	6656	Both	Yes	No
4.3m 14Ft 1PH/32A Power Cord 22G	6657	Both	Yes	No
4.3m 14Ft 1PH/24A Pwr Cd Kor 22G	6658	Both	Yes	No
Pwr.Cord(9ft),To wall/OEM PDU 22G	6659	Both	Yes	No
Pwr Crd 14ft 4.3m wallOEM PDU 22G	6660	Both	Yes	No
Pwr Crd 2.8m 9.2ft PDU 22G	6665	Both	Yes	No
4.3m 14Ft 3PH/32A Pwr Cd Aus 22G	6667	Both	Yes	No
Pwr Crd 4.3M, Drwr - OEM PDU 22G	6669	Both	Yes	No
Pwr Crd 2.7m, Drwr - IBM PDU 22G	6671	Both	Yes	No
Pwr Crd 2M, Drwr - IBM PDU 22G	6672	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU 22G	6680	Both	Yes	No
Intelligent PDU+ 1 EIA Unit 22G	7109	Support	Yes	No
Environmental Monitoring Probe 22G	7118	Both	Yes	No
Power Distribution Unit 22G	7188	Both	Yes	No
PowDistribUnit(US)Fixed PowCrd 22G	7196	Support	Yes	No
Eth Cbl 15M HW Management 22G	7802	Both	Yes	No
Linux Software Preinstall 22G	8143	Initial	N/A	No
Linux Software Preinstall BP 22G	8144	Initial	N/A	No
USB Mouse 22G	8845	Support	Yes	No
Order Routing Indicator Syste 22G	9169	Initial	N/A	No
Language Group Spcf-US Eng 22G	9300	Initial	N/A	No
Specify mode-1 & CEC SAS port 22G	9387	MES	Yes	No

New AIX License Core Counter	22G	9440	Initial	N/A	No
New IBM i Lic Core Counter	22G	9441	Initial	N/A	No
New Red Hat Lic Core Counter	22G	9442	Initial	N/A	No
New SUSE Lic Core Counter	22G	9443	Initial	N/A	No
Other AIX Lic Core Counter	22G	9444	Initial	N/A	No
Other Linux Lic Core Counter	22G	9445	Initial	N/A	No
3rd Party Linux Lic Core Cnt	22G	9446	Initial	N/A	No
VIOS Core Counter	22G	9447	Initial	N/A	No
Other License Core Counter	22G	9449	Initial	N/A	No
Ubuntu Linux License Core Cntr	22G	9450	Initial	N/A	No
Month Indicator	22G	9461	Initial	N/A	No
Day Indicator	22G	9462	Initial	N/A	No
Hour Indicator	22G	9463	Initial	N/A	No
Minute Indicator	22G	9464	Initial	N/A	No
Qty Indicator	22G	9465	Initial	N/A	No
Countable Member Indicator	22G	9466	Initial	N/A	No
Language Group Spcf-Dutch	22G	9700	Initial	N/A	No
Language Group Spcf-French	22G	9703	Initial	N/A	No
Language Group Spcf-German	22G	9704	Initial	N/A	No
Language Group Spcf-Polish	22G	9705	Initial	N/A	No
Lang Group Specify - Norwegian	22G	9706	Initial	N/A	No
Lang.Group Spcf-Portuguese	22G	9707	Initial	N/A	No
Language Group Spcf-Spanish	22G	9708	Initial	N/A	No
Language Group Spcf-Italian	22G	9711	Initial	N/A	No
Langua Gr Speci Canadian Frenc	22G	9712	Initial	N/A	No
Language Group Spcf-Japanese	22G	9714	Initial	N/A	No
Language Group Specify Tr Chin	22G	9715	Initial	N/A	No
Language Group Spcf-Korean	22G	9716	Initial	N/A	No
Language Group Spcf-Turkish	22G	9718	Initial	N/A	No
Language Group Spcf-Hungarian	22G	9719	Initial	N/A	No
Language Group Spcf-Slovakian	22G	9720	Initial	N/A	No
Language Group Spcf-Russian	22G	9721	Initial	N/A	No
Lang Group Spcf Simpl Chinese	22G	9722	Initial	N/A	No
Language Group Spcf-Czech	22G	9724	Initial	N/A	No
Language Group Spcf-Romanian	22G	9725	Initial	N/A	No
Lang Group Specify - Croatian	22G	9726	Initial	N/A	No
Language Group Spcf-Slovenian	22G	9727	Initial	N/A	No

Lang Group Specify - Braz Port	22G	9728	Initial	N/A	No
Lang Group Specify - Thai	22G	9729	Initial	N/A	No
QSFP+ 40GbE Transceiver	22G	EB27	Both	Yes	No
1m Passive QSFP+ to QSFP+ Cbl	22G	EB2B	Both	Yes	No
3m Passive QSFP+ to QSFP+ Cbl	22G	EB2H	Both	Yes	No
10m QSFP+ MTP Optical Cable	22G	EB2J	Both	Yes	No
30m QSFP+ MTP Optical Cable	22G	EB2K	Both	Yes	No
Power Supply 1400W 200-240 VAC	22G	EB2M	Both	Yes	No
Lift tool GenieLift GL-8	22G	EB3Z	Both	Yes	No
10GbE Optical Transc SFP+ SR	22G	EB46	Both	Yes	No
25GbE Opt Transceiver SFP28	22G	EB47	Both	Yes	No
0.5 SFP/25GbE CU Cable	22G	EB4J	Both	Yes	No
1.0 SFP/25GbE CU Cable	22G	EB4K	Both	Yes	No
1.5 SFP/25GbE CU Cable	22G	EB4L	Both	Yes	No
2.0 SFP/25GbE CU Cable	22G	EB4M	Both	Yes	No
2.5 QSFP28/100GbE CU Cable	22G	EB4P	Both	Yes	No
Service wedge shelf for	EB3Z				
0.5m EDR IB Copper Cable	22G	EB4Z	Both	No	No
1.0m EDR IB Copper Cable	22G	EB50	Support	Yes	No
2.0M EDR IB Copper Cable	22G	EB51	Both	Yes	No
1.5M EDR IB Copper Cable	22G	EB52	Both	Yes	No
100GbE Optic Transc QSFP28	22G	EB54	Both	Yes	No
3M EDR IB Optical Cable	22G	EB59	Both	Yes	No
5M EDR IB Optical Cable	22G	EB5A	Both	Yes	No
10M EDR IB Optical Cable	22G	EB5B	Both	Yes	No
15M EDR IB Optical Cable	22G	EB5C	Both	Yes	No
20M EDR IB Optical Cable	22G	EB5D	Both	Yes	No
30M EDR IB Optical Cable	22G	EB5E	Both	Yes	No
50M EDR IB Optical Cable	22G	EB5F	Both	Yes	No
100M EDR IB Optical Cable	22G	EB5G	Both	Yes	No
0.5M 100GbE Cu Cable QSFP28	22G	EB5H	Both	Yes	No
1.0M 100GbE Cu Cable QSFP28	22G	EB5J	Both	Yes	No
1.5M 100GbE Cu Cable QSFP28	22G	EB5K	Both	Yes	No
2.0M 100GbE Cu Cable QSFP28	22G	EB5L	Both	Yes	No
25M EDR IB Optical Cable	22G	EB5M	Both	Yes	No
3M 100GbE Optic Cable QSFP28	22G	EB5N	Both	Yes	No
5M 100GbE Optic Cable QSFP28	22G	EB5R	Both	Yes	No
	22G	EB5S	Both	Yes	No

10M 100GbE optic Cable	QSFP28 22G	EB5T	Both	Yes	No
15M 100GbE optic Cable	QSFP28 22G	EB5U	Both	Yes	No
20M 100GbE optic Cable	QSFP28 22G	EB5V	Both	Yes	No
30M 100GbE optic Cable	QSFP28 22G	EB5W	Both	Yes	No
50M 100GbE optic Cable	QSFP28 22G	EB5X	Both	Yes	No
100M 100GbE optic Cable	QSFP28 22G	EB5Y	Both	Yes	No
IBM i 7.2 Indicator	22G	EB72	Support	Yes	No
IBM i 7.3 Indicator	22G	EB73	Both	Yes	No
IBM i 7.4 Indicator	22G	EB74	Both	Yes	No
USB 3.0 Cable	22G	EBK8	Both	Yes	No
Slim Rear Acoustic Door	22G	EC07	MES	Yes	No
Slim Front Acoustic Door	22G	EC08	MES	Yes	No
PCIe3 LP 2-port 10GbE NIC Ro	22G	EC2R	Both	Yes	No
PCIe3 2-Port 10Gb NIC&ROCE	22G	EC2S	Both	Yes	No
PCIe3 LP 2-port 25/10GbE NIC	22G	EC2T	Both	Yes	No
PCIe3 2-Port 25/10Gb NIC&Ro	22G	EC2U	Both	Yes	No
PCIe3 LP 2-port 10GbE NIC&R Cu	22G	EC37	Support	Yes	No
PCIe3 2-port 10GbE NIC&RoCE Cu	22G	EC38	Support	Yes	No
PCIe3 LP 2-Port 40GbE NIC RoCE	22G	EC3A	Support	Yes	No
PCIe3 2-Port 40GbE NIC RoCE	22G	EC3B	Support	Yes	No
PCIe3 LP 2port 100Gb EDR IB Ad	22G	EC3E	Support	Yes	No
PCIe3 LP 2-port 100GbE Adptx16	22G	EC3L	Support	Yes	No
PCIe3 LP 1port 100Gb EDR IB Ad	22G	EC3T	Support	Yes	No
PCIe2 LP 4-Pt USB 3.0 Adapter	22G	EC45	Both	Yes	No
PCIe2 4-Port USB 3.0 Adapter	22G	EC46	Both	Yes	No
PCIe LP 3D Graphics adpt x16	22G	EC51	Support	Yes	No
PCIe3 x8 LP 3.2TB NVMe AIX/L	22G	EC5C	Both	Yes	No
PCIe3 x8 LP 6.4TB NVMe AIX/L	22G	EC5E	Both	Yes	No
PCIe3 x8 LP 1.6TB NVMe AIX/L	22G	EC5G	Both	Yes	No
Enterprise 6.4TB NVMe U.2	22G	EC5V	Both	Yes	No
Mainstream 800GB SSD NVMe	22G	EC5X	Both	Yes	No
PCIe4 LP 1-port 100Gb EDR	22G	EC62	Both	Yes	No
PCIe4 LP 2-port 100Gb EDR	22G	EC64	Both	Yes	No
PCIe4 LP 2-port 100Gb ROCE	22G	EC67	Both	Yes	No
SAS X Cable 3m - HD Narrow	22G	ECBJ	Both	Yes	No
SAS X Cable 6m - HD Narrow	22G	ECBK	Both	Yes	No
SAS X Cable 10m - HD Narrow	22G	ECBL	Both	Yes	No

SAS X Cable 15m -HD Narrow 3Gb	22G	ECBM	Both	Yes	No
5m Passive QSFP+ to QSFP+ Cbl	22G	ECBN	Support	Yes	No
SAS YO Cable 1.5m - HD Narrow	22G	ECBT	Both	Yes	No
SAS YO Cable 3m - HD Narrow	22G	ECBU	Both	Yes	No
SAS YO Cable 6m - HD Narrow	22G	ECBV	Both	Yes	No
SAS YO Cable 10m - HD Narrow	22G	ECBW	Both	Yes	No
SAS YO Cable 15m-HD Narrow 3Gb	22G	ECBX	Both	Yes	No
SAS AE1 Cable 4m - HD Narrow	22G	ECBY	Both	Yes	No
SAS YE1 Cable 3m - HD Narrow	22G	ECBZ	Both	Yes	No
3M Optical Cable Pair	22G	ECC7	Support	Yes	No
10M Optical Cable Pair	22G	ECC8	Support	Yes	No
Port Converter Cable for UPS	22G	ECCF	Both	N/A	No
Var 1th Blue Cat5e Cable	22G	ECCG	Initial	N/A	No
Var 1th Green Cat5e Cable	22G	ECCH	Initial	N/A	No
3M Copper CXP Cable Pair	22G	ECCS	Both	Yes	No
3M Active Optical Cable Pair	22G	ECCX	Both	Yes	No
10M Active Optical Cbl Pair	22G	ECCY	Both	Yes	No
3.0M SAS X12 Cable	22G	ECDJ	Both	Yes	No
4.5M SAS X12 Cable	22G	ECDK	Both	Yes	No
10M SAS X12 Cable	22G	ECDL	Both	Yes	No
1.5M SAS Y012 Cable	22G	ECDT	Both	Yes	No
3.0M SAS Y012 Cable	22G	ECDU	Both	Yes	No
4.5M SAS Y012 Cable	22G	ECDV	Both	Yes	No
10M SAS Y012 Cable	22G	ECDW	Both	Yes	No
0.6M SAS AA12 Cable	22G	ECE0	Both	Yes	No
3.0M SAS AA12 Cable	22G	ECE3	Both	Yes	No
4.5M SAS AA12 Cable	22G	ECE4	Both	Yes	No
4.3m (14-Ft) PDU to wall Pwr	22G	ECJ5	Both	Yes	No
4.3m (14-Ft) PDU to wall Pwr	22G	ECJ7	Both	Yes	No
High Function 9xC19 PDU plus	22G	ECJJ	Both	Yes	No
High Function9xC19 PDU plus	22G	ECJL	Both	Yes	No
High Function12xC13 PDU plus	22G	ECJN	Both	Yes	No
High Function12xC13 PDU plus	22G	ECJQ	Both	Yes	No
Cloud Private Solution	22G	ECP0	Initial	N/A	No
2.0 M Slim Rack	22G	ECR0	MES	Yes	No
Rack Front Door	22G	ECRF	MES	Yes	No
Rack Rear Door Black	22G	ECRG	MES	Yes	No

Rack Side Cover	22G	ECRJ	MES	Yes	No
Rack Rear Extension 5-In	22G	ECRK	MES	Yes	No
Rack Front Door (Black/Flat)	22G	ECRM	MES	Yes	No
Custom Serv. Specify, France	22G	ECSF	Both	Yes	No
Custom Serv. Specify, Mexico	22G	ECSM	Both	Yes	No
Custom Serv. Spec Poughkeepsie	22G	ECSP	Both	Yes	No
Integrated Solution Packing	22G	ECSS	Initial	N/A	No
Optical Wrap Plug	22G	ECW0	Both	Yes	No
IBM i Enablement EP5Y	22G	EEPY	Initial	N/A	No
1x HW Subscription Increment	22G	EHB1	MES	Yes	No
10x HW Subscription Increment	22G	EHB2	MES	Yes	No
100x HW Subscription Increment	22G	EHB3	MES	Yes	No
SAP HANA TRACKING FEAT	22G	EHKV	Both	Yes	No
Power for SAS Viya (Linux)	22G	EHLU	Both	Yes	No
Power for SAS 9.4 Grid (AIX)	22G	EHLV	Both	Yes	No
Epic Solution indicator	22G	EHM0	Initial	N/A	No
Boot Drive in EXP12SX Specify	22G	EHR1	Both	Yes	No
Boot / Load in EXP24SX Specify	22G	EHR2	Both	Yes	No
SSD Placement Ind- #ESLS/#ELLS	22G	EHS2	Both	Yes	No
SAS Port/single Backplane	22G	EJ00	Both	Yes	No
PCIe3 Optical Cable Adapter	22G	EJ05	Support	Yes	No
PCIe3 RAID SAS Adapter 4-port	22G	EJ0J	Both	Yes	No
PCIe3 12GB Cache RAID SAS Adap	22G	EJ0L	Support	Yes	No
PCIe3 LP RAID SAS ADAPTER	22G	EJ0M	Both	Yes	No
PCIe3 SAS Tape/DVD Adapter	22G	EJ10	Both	Yes	No
PCIe3 LP SAS Tape/DVD Adapter	22G	EJ11	Both	Yes	No
PCIe3 12GB Cache RAID+ SAS Ada	22G	EJ14	Both	Yes	No
Storage Backplane 8 SFF-3	22G	EJ1F	Both	No	No
Backplane 8 SFF & Single IOA	22G	EJ1G	Both	No	No
Split#EJ1F Add 2nd Control	22G	EJ1H	Both	No	No
PCIe1 LP SAS Tape/DVD 2P 3Gb	22G	EJ1N	Both	Yes	No
PCIe1 SAS Tape/DVD 2P 3Gb x8	22G	EJ1P	Both	Yes	No
NVMe U.2 Passthru adapter	22G	EJ1Q	MES	Yes	No
PCIe X16 to CXP Adapter	22G	EJ1R	Both	Yes	No
Backplane w/2 Gen4 NVMe U.2	22G	EJ1V	Both	No	No
Backplane w/4 Gen4 NVMe U.2	22G	EJ1W	Both	No	No
PCIe3 Crypto Coproc BSC-3 4767	22G	EJ33	Both	Yes	No

Specify Mode1 & (1)EJ0J-EXP24S 22G	EJR1	MES	Yes	No
Specify Mode1 & (2)EJ0J-EXP24S 22G	EJR2	MES	Yes	No
Specify Mode2 & (2)EJ0J-EXP24S 22G	EJR3	MES	Yes	No
Specify Mode2 & (4)EJ0J-EXP24S 22G	EJR4	MES	Yes	No
Specify Mode4 & (4)EJ0J-EXP24S 22G	EJR5	MES	Yes	No
Specify Mode2 & (1)EJ0J-EXP24S 22G	EJR6	MES	Yes	No
Specify Mode2 & (2)EJ0J-EXP24S 22G	EJR7	MES	Yes	No
Specify Mode2 & (1)EJ0J-EXP24S 22G	EJRA	MES	Yes	No
Specify Mode2 & (2)EJ0J-EXP24S 22G	EJRB	MES	Yes	No
Specify-Mode4 & (1)EJ0J-EXP24S 22G	EJRC	MES	Yes	No
Specify-Mode4 & (2)EJ0J-EXP24S 22G	EJRD	MES	Yes	No
Specify-Mode4 & (3)EJ0J-EXP24S 22G	EJRE	MES	Yes	No
Specify Mode1 & (2)EJ14-EXP24S 22G	EJRF	MES	Yes	No
Specify Mode2 & (2)EJ14-EXP24S 22G	EJRG	MES	Yes	No
Specify Mode2 & (2)EJ14-EXP24S 22G	EJRH	MES	Yes	No
Specify Mode2 & (4)EJ14+EXP24S 22G	EJRJ	MES	Yes	No
Non-paired Indicator EJ0L PCIe 22G	EJRL	Both	Yes	No
Specify Mode1 & (2)EJ0L-EXP24S 22G	EJRP	MES	Yes	No
Specify Mode2 & (4)EJ0L EXP24S 22G	EJRR	MES	Yes	No
Specify Mode2 & (2)EJ0L-EXP24S 22G	EJRS	MES	Yes	No
Specify Mode2 & (2)EJ0L-EXP24S 22G	EJRT	MES	Yes	No
Non-paired Indicator EJ0L PCIe 22G	EJRU	MES	Yes	No
Specify Mode1 (1)6G YO EXP24S 22G	EJSU	MES	N/A	No
Front IBM Bezel 8-Bay BackPl 22G	EJU6	Both	Yes	No
Front OEM Bezel 8-Bay BackP 22G	EJU7	Both	Yes	No
Front IBM Bezel for 4 NVMe 22G	EJUN	Both	Yes	No
Front OEM Bezel 4 NVMe Bays 22G	EJUP	Both	Yes	No
Specify Mode-1 for EXP12SX 1&1 22G	EJV1	Both	Yes	No
Specify Mode-1 for EXP12SX 2&2 22G	EJV2	Both	Yes	No
Specify Mode-2 for EXP12SX 2&2 22G	EJV3	Both	Yes	No
Specify Mode-2 for EXP12SX 4&2 22G	EJV4	Both	Yes	No
Specify Mode-4 for EXP12SX 4&2 22G	EJV5	Both	Yes	No
Specify Mode-2 for EXP12SX 1&2 22G	EJV6	Both	Yes	No
Specify Mode-2 for EXP12SX 2&2 22G	EJV7	Both	Yes	No
Specify Mode-2 for EXP12SX 1&1 22G	EJVA	Both	Yes	No
Specify Mode-2 for EXP12SX 2&1 22G	EJVB	Both	Yes	No
Specify Mode-4 for EXP12SX 1&1 22G	EJVC	Both	Yes	No

Specify Mode-4 for EXP12SX 2&1	22G	EJVD	Both	Yes	No
Specify Mode-4 for EXP12SX 3&2	22G	EJVE	Both	Yes	No
Specify Mode-1 for EXP12SX 2&2	22G	EJVF	Both	Yes	No
Specify Mode-1 for EXP12SX 2&2	22G	EJVP	MES	Yes	No
Specify Mode-1 for EXP12SX	22G	EJVV	Both	Yes	No
Specify Mode-1 for EXP24SX 1&1	22G	EJW1	Both	Yes	No
Specify Mode-1 for EXP24SX 2&2	22G	EJW2	Both	Yes	No
Specify Mode-2 for EXP24SX 2&2	22G	EJW3	Both	Yes	No
Specify Mode-2 for EXP24SX 4&2	22G	EJW4	Both	Yes	No
Specify Mode-4 for EXP24SX 4&2	22G	EJW5	Both	Yes	No
Specify Mode-2 for EXP24SX 1&2	22G	EJW6	Both	Yes	No
Specify Mode-2 for EXP24SX 2&2	22G	EJW7	Both	Yes	No
Specify Mode-2 for EXP24SX 1&1	22G	EJWA	Both	Yes	No
Specify Mode-2 for EXP24SX 2&1	22G	EJWB	Both	Yes	No
Specify Mode-4 for EXP24SX 1&1	22G	EJWC	Both	Yes	No
Specify Mode-4 for EXP24SX 2&1	22G	EJWD	Both	Yes	No
Specify Mode-4 for EXP24SX 3&2	22G	EJWE	Both	Yes	No
Specify Mode-1 for EXP24SX 2&2	22G	EJWF	Both	Yes	No
Specify Mode-2 for EXP24SX 2&2	22G	EJWG	Both	Yes	No
Specify Mode-2 for EXP24SX 2&1	22G	EJWH	Both	Yes	No
Specify Mode-2 for EXP24SX 4&2	22G	EJWJ	Both	Yes	No
Specify Mode-1 for EXP24SX 2&2	22G	EJWP	MES	Yes	No
Specify Mode-2 for EXP24SX 4&2	22G	EJWR	MES	Yes	No
Specify Mode-2 for EXP24SX 2&2	22G	EJWS	MES	Yes	No
Specify Mode-2 for EXP24SX 2&1	22G	EJWT	MES	Yes	No
Specify Mode-1 for EXP24SX	22G	EJWU	Both	Yes	No
PDU Access Cord 0.38m	22G	ELC0	MES	Yes	No
Power Cord - Drawer to PDU	22G	ELC5	Both	Yes	No
ES1F Load Source Specify	22G	ELS3	Both	Yes	No
#ESNJ Load Source Specify	22G	ELUJ	Both	Yes	No
8 GB DDR4 2666 RDIMM	22G	EM60	Support	Yes	No
16 GB DDR4 Memory	22G	EM62	Both	Yes	No
32 GB DDR4 Memory	22G	EM63	Both	Yes	No
64 GB DDR4 Memory	22G	EM64	Both	Yes	No
128 GB DDR4 Memory	22G	EM65	Both	Yes	No
512GB (16x32GB) Memory DIMMs	22G	EM67	Initial	N/A	No
PCIe Gen3 I/O Expansion Drawer	22G	EMX0	Both	Yes	No

AC Power Supply Conduit	22G	EMXA	Both	Yes	No
PCIe3 6-slot Fanout Module	22G	EMXF	Support	Yes	No
PCIe3 6-slot Fanout Module	22G	EMXG	Support	Yes	No
PCIe3 6-slot Fanout Mod	22G	EMXH	Both	Yes	No
1m 10GbE Cable SFP+ Act Twinax	22G	EN01	Both	Yes	No
3m 10GbE Cable SFP+ Act Twinax	22G	EN02	Both	Yes	No
5m 10GbE Cable SFP+ Act Twinax	22G	EN03	Both	Yes	No
PCIe3 16Gb 2-port Fibre Channe	22G	EN0A	Both	Yes	No
PCIe3 LP 16Gb 2-port Fibre Cha	22G	EN0B	Both	Yes	No
PCIe2 LP 8Gb 2-Port Fibre Chan	22G	EN0F	Support	Yes	No
PCIe2 8Gb 2-Port Fibre Channel	22G	EN0G	Support	Yes	No
PCIe3 4-port 10Gb FCoE & 1GbE	22G	EN0H	Both	Yes	No
PCIe3 LP 4-port 10Gb FCoE & 1G	22G	EN0J	Both	Yes	No
PCIe3 4-port 10Gb FCoE & 1GbE	22G	EN0K	Both	Yes	No
PCIe3 LP 4-port 10Gb FCoE & 1GE	22G	EN0L	Both	Yes	No
PCIe2 4-pt(10+1 GbE)SR+RJ45	22G	EN0S	Both	Yes	No
PCIe2 LP4-pt(10+1 GbE)SR+RJ45	22G	EN0T	Both	Yes	No
PCIe2 4-pt(10+1GbE)CRSR+RJ45	22G	EN0U	Both	Yes	No
PCIe2 LP4-pt(10+1GbE)CRSR+RJ45	22G	EN0V	Both	Yes	No
PCIe2 2-pt 10/1GbE BaseT RJ45	22G	EN0W	Both	Yes	No
PCIe2 LP2-pt10/1GbE BaseT RJ45	22G	EN0X	Both	Yes	No
PCIe2 LP 8Gb 4-port Fibre Chan	22G	EN0Y	Support	Yes	No
PCIe2 8Gb 4-port Fibre Channel	22G	EN12	Support	Yes	No
PCIe3 4-port 10GbE SR Adapter	22G	EN15	Both	Yes	No
PCIe3 32Gb 2-port FC Adapter	22G	EN1A	Both	Yes	No
PCIe3 LP 32Gb 2-port FC Adap	22G	EN1B	Both	Yes	No
PCIe3 16Gb 4-port FC Adapter	22G	EN1C	Both	Yes	No
PCIe3 LP 16Gb 4-port FC Adap	22G	EN1D	Both	Yes	No
PCIe3 2-Port 16Gb FC Adapter	22G	EN1G	Both	Yes	No
PCIe3 LP 2-Port 16Gb FC Adap	22G	EN1H	Both	Yes	No
200GB IBM i NVMe Load Source	22G	ENSA	Both	Yes	No
400GB IBM i NVMe Load Source	22G	ENSB	Both	Yes	No
4-core 2.8/3.8 GHZ POWER9	22G	EP56	Both	No	No
8-core 3.4/3.9 GHZ POWER9	22G	EP58	Both	No	No
10-core 2.9/3.8 GHZ POWER9	22G	EP59	Both	No	No
11-core 2.8/3.8 GHZ POWER9	22G	EP5B	Both	No	No

1-core 2.8/3.8 GHZ POWER9	22G	EP5Y	Initial	N/A	No
One Proc Activation for EP56	22G	EP66	Both	Yes	No
One Proc Activation for EP58	22G	EP68	Both	Yes	No
One Proc Activation for EP59	22G	EP69	Both	Yes	No
One Proc Activation for EP5B	22G	EP6B	Both	Yes	No
One Proc Activation for EP5Y	22G	EP6Y	Initial	N/A	No
Deactivation of LPM	22G	EPA0	Both	Yes	No
Horizontal PDU Mounting Hardwr	22G	EPTH	Both	Yes	No
High Function 9xC19 PDU	22G	EPTJ	Support	Yes	No
High Function 9xC19 PDU 3Phase	22G	EPTL	Support	Yes	No
High Function 12xC13 PDU	22G	EPTN	Support	Yes	No
High Function 12xC13 PDU 3-Phs	22G	EPTQ	Support	Yes	No
Qty 150 #ES62 3.86TB LFF Dsk	22G	EQ62	Both	Yes	No
Qty 150 #ES64 7.72TB LFF Dsk	22G	EQ64	Both	Yes	No
Qty 150 #ES78 SSD 387GB 5xx	22G	EQ78	Support	Yes	No
Qty 150 #ES7E SSD 775GB 5xx	22G	EQ7E	Support	Yes	No
Quantity 150 of ES80 1.9TB SSD	22G	EQ80	Support	Yes	No
Qty 150 #ES85 SSD 387GB 4k	22G	EQ85	Support	Yes	No
Qty 150 #ES8C SSD 775GB 4k	22G	EQ8C	Support	Yes	No
Qty 150 #ES8F SSD 1.55TB 4k	22G	EQ8F	Support	Yes	No
Quantity 150 of ES8Y 931GB	22G	EQ8Y	Support	Yes	No
Quantity 150 of ES96 1.86TB	22G	EQ96	Support	Yes	No
Quantity 150 of #ESE7 3.72TB	22G	EQE7	Support	Yes	No
Quantity 150 of #ESEV 600GB	22G	EQEV	Both	Yes	No
Quantity 150 of #ESEZ 300GB	22G	EQEZ	Support	Yes	No
Quantity 150 of #ESF3 1.2TB	22G	EQF3	Both	Yes	No
Quantity 150 of #ESFP 600GB	22G	EQFP	Support	Yes	No
Quantity 150 of #ESFT 1.8TB	22G	EQFT	Both	Yes	No
Quantity 150 of #ESG5	22G	EQG5	Support	Yes	No
Quantity 150 of #ESGB	22G	EQGB	Support	Yes	No
Quantity 150 of #ESGF	22G	EQGF	Support	Yes	No
Quantity 150 of #ESGK	22G	EQGK	Support	Yes	No
Quantity 150 of #ESGP	22G	EQGP	Support	Yes	No
Quantity 150 of ES94 387GB	22G	ER94	Both	Yes	No
Bulk Pack Request Indicator	22G	ERB0	Initial	N/A	No
Bulk Packaging Identifier #1	22G	ERB1	Initial	N/A	No
Bulk Packaging Identifier #2	22G	ERB2	Initial	N/A	No

Bulk Packaging Identifier #3	22G	ERB3	Initial	N/A	No
Bulk Packaging Identifier #4	22G	ERB4	Initial	N/A	No
Bulk Packaging Identifier #5	22G	ERB5	Initial	N/A	No
Bulk Packaging Identifier #6	22G	ERB6	Initial	N/A	No
Bulk Packaging Identifier #7	22G	ERB7	Initial	N/A	No
Bulk Packaging Identifier #8	22G	ERB8	Initial	N/A	No
Bulk Packaging Identifier #9	22G	ERB9	Initial	N/A	No
Bulk Packaging Identifier #10	22G	ERBA	Initial	N/A	No
Bulk Packaging Identifier #11	22G	ERBB	Initial	N/A	No
Bulk Packaging Identifier #12	22G	ERBC	Initial	N/A	No
Bulk Packaging Identifier #13	22G	ERBD	Initial	N/A	No
Bulk Packaging Identifier #14	22G	ERBE	Initial	N/A	No
Bulk Packaging Identifier #15	22G	ERBF	Initial	N/A	No
Bulk Packaging Identifier #16	22G	ERBG	Initial	N/A	No
Bulk Packaging Identifier #17	22G	ERBH	Initial	N/A	No
Bulk Packaging Identifier #18	22G	ERBJ	Initial	N/A	No
Bulk Packaging Identifier #19	22G	ERBK	Initial	N/A	No
Bulk Packaging Identifier #20	22G	ERBL	Initial	N/A	No
Single Pack Request Indicator	22G	ERBZ	Initial	N/A	No
RFID Tags for Compute Nodes	22G	ERF1	Initial	N/A	No
Rear rack extension	22G	ERG0	MES	Yes	No
Quantity 150 of ESGV 387GB	22G	ERGV	Both	Yes	No
Quantity 150 of ESGZ 775GB	22G	ERGZ	Both	Yes	No
Quantity 150 of ESHJ	22G	ERHJ	Support	Yes	No
Quantity 150 of ESHL	22G	ERHL	Support	Yes	No
Quantity 150 of ESHN	22G	ERHN	Support	Yes	No
Quantity 150 of ESJ0 931GB	22G	ERJ0	Both	Yes	No
Quantity 150 of ESJ2 1.86TB	22G	ERJ2	Both	Yes	No
Quantity 150 of ESJ4 3.72TB	22G	ERJ4	Both	Yes	No
Quantity 150 of ESJ6 7.45TB	22G	ERJ6	Both	Yes	No
Quantity 150 of ESM8	22G	ERM8	Support	Yes	No
Quantity 150 of ESNA 775GB	22G	ERNA	Both	Yes	No
Quantity 150 of ESNE 1.55TB	22G	ERNE	Both	Yes	No
Enterprise 1.6TB NVMe U.2	22G	ES1E	Both	Yes	No
Enterprise 1.6TB NVMe U.2	22G	ES1F	Both	Yes	No
Enterprise 3.2TB NVMe U.2	22G	ES1G	Both	Yes	No
3.86TB 7200 RPM SAS LFF Disk	22G	ES62	Both	Yes	No

7.72TB 7200 RPM SAS LFF Disk	22G	ES64	Both	Yes	No
387GB SFF-2 SSD 5xx for AIX/L	22G	ES78	Support	Yes	No
775GB SFF-2 SSD 5xx for AIX/L	22G	ES7E	Support	Yes	No
387GB SFF-3 SSD 5xx for AIX/L	22G	ES7K	Support	Yes	No
775GB SFF-3 SSD 5xx for AIX/L	22G	ES7P	Support	Yes	No
1.9TB RI SAS 4k SFF-2 SSD AIX	22G	ES80	Support	Yes	No
931GB Mainstream SAS 4k SSD	22G	ES83	Support	Yes	No
387GB SFF-2 SSD 4k for AIX/Li	22G	ES85	Support	Yes	No
775GB SFF-2 SSD 4k for AIX/Li	22G	ES8C	Support	Yes	No
1.55TB SFF-2 SSD 4k for AIX/L	22G	ES8F	Support	Yes	No
1.9TB RI SAS 4k SFF-3 SSD AIX	22G	ES8J	Support	Yes	No
387GB SFF-3 SSD 4k for AIX/Li	22G	ES8N	Support	Yes	No
775GB SFF-3 SSD 4k for AIX/Li	22G	ES8Q	Support	Yes	No
1.55TB SFF-3 SSD 4k for AIX/L	22G	ES8V	Support	Yes	No
931GB Mainstream SAS 4k SSD	22G	ES8Y	Support	Yes	No
387GB Enterprise SAS 4k SFF3	22G	ES90	Both	Yes	No
1.86TB Mainstream SAS 4k SSD	22G	ES92	Support	Yes	No
387GB Enterprise SAS 4k SFF2	22G	ES94	Both	Yes	No
1.86TB Mainstream SAS 4k SSD	22G	ES96	Support	Yes	No
387GB Enterprise SAS 5xxSFF3	22G	ESB0	Both	Yes	No
387GB Enterprise SAS 5xxSFF2	22G	ESB2	Both	Yes	No
775GB Enterprise SAS 5xxSFF3	22G	ESB4	Both	Yes	No
775GB Enterprise SAS 5xxSFF2	22G	ESB6	Both	Yes	No
387GB Enterprise SAS 4k SFF3	22G	ESB8	Both	Yes	No
387GB Enterprise SAS 4k SFF2	22G	ESBA	Both	Yes	No
775GB Enterprise SAS 4k SFF3	22G	ESBE	Both	Yes	No
775GB Enterprise SAS 4k SFF2	22G	ESBG	Both	Yes	No
1.55TB Enterprise SAS 4ksFF3	22G	ESBJ	Both	Yes	No
1.55TB Enterprise SAS 4ksFF2	22G	ESBL	Both	Yes	No
S&H - No Charge	22G	ESC0	Both	Yes	No
S&H-a	22G	ESC5	Initial	N/A	No
600GB 10K RPM SAS SFF3 Disk	22G	ESD5	Both	Yes	No
300GB 15K RPM SAS SFF-3 Disk	22G	ESDB	Both	Yes	No
3.72TB Mainstream SAS 4k SSD	22G	ESE1	Support	Yes	No
3.72TB Mainstream SAS 4k SSD	22G	ESE7	Support	Yes	No
600GB 10K RPM SFF-2 Disk 4K	22G	ESEV	Both	Yes	No
300GB 15K SAS SFF-2 4K BLK HDD	22G	ESEZ	Support	Yes	No

1.2TB 10K RPM SFF-2 Disk 4K	22G	ESF3	Both	Yes	No
600GB 10K RPM SFF-3 Disk 4K	22G	ESF5	Both	Yes	No
1.2TB 10K RPM SFF-3 Disk 4K	22G	ESF9	Both	Yes	No
300GB 15K SAS SFF-3 4K BLK HDD	22G	ESFB	Support	Yes	No
600GB 15K SAS SFF-3 4K BLK HDD	22G	ESFF	Support	Yes	No
600GB 15K SAS SFF-2 4K BLK HDD	22G	ESFP	Support	Yes	No
1.8TB 10K RPM SFF-2 Disk 4K	22G	ESFT	Both	Yes	No
1.8TB 10K RPM SFF-3 Disk 4K	22G	ESFV	Both	Yes	No
387GB Enterprise SAS 5xx SSD	22G	ESG5	Support	Yes	No
387GB Enterprise SAS 5xx SSD	22G	ESG9	Support	Yes	No
387GB Enterprise SAS 4k SSD	22G	ESGB	Support	Yes	No
387GB Enterprise SAS 4k SSD	22G	ESGD	Support	Yes	No
775GB Enterprise SAS 5xx SSD	22G	ESGF	Support	Yes	No
775GB Enterprise SAS 5xx SSD	22G	ESGH	Support	Yes	No
775GB Enterprise SAS 4k SSD	22G	ESGK	Support	Yes	No
775GB Enterprise SAS 4k SSD	22G	ESGM	Support	Yes	No
1.55TB Enterprise SAS 4k SSD	22G	ESGP	Support	Yes	No
1.55TB Enterprise SAS 4k SSD	22G	ESGR	Support	Yes	No
387GB Enterprise SAS 5xxSFF3	22G	ESGT	Both	Yes	No
387GB Enterprise SAS 5xxSFF2	22G	ESGV	Both	Yes	No
775GB Enterprise SAS 5xxSFF3	22G	ESGX	Both	Yes	No
775GB Enterprise SAS 5xxSFF2	22G	ESGZ	Both	Yes	No
931GB Mainstream SAS 4k SSD	22G	ESHJ	Support	Yes	No
1.86TB Mainstream SAS 4k SSD	22G	ESHL	Support	Yes	No
7.45TB Mainstream SAS 4k SSD	22G	ESHN	Support	Yes	No
931GB Mainstream SAS 4k SSD	22G	ESHS	Support	Yes	No
1.86TB Mainstream SAS 4k SSD	22G	ESHU	Support	Yes	No
7.45TB Mainstream SAS 4k SSD	22G	ESHW	Support	Yes	No
931GB Mainstream SAS 4k SFF2	22G	ESJ0	Both	Yes	No
1.86TB Mainstream SAS 4kSFF2	22G	ESJ2	Both	Yes	No
3.72TB Mainstream SAS 4kSFF2	22G	ESJ4	Both	Yes	No
7.45TB Mainstream SAS 4kSFF2	22G	ESJ6	Both	Yes	No
931GB Mainstream SAS 4k SFF3	22G	ESJ8	Both	Yes	No
1.86TB Mainstream SAS 4kSFF3	22G	ESJA	Both	Yes	No
3.72TB Mainstream SAS 4kSFF3	22G	ESJC	Both	Yes	No
7.45TB Mainstream SAS 4kSFF3	22G	ESJE	Both	Yes	No
Specify AC Power Supply	22G	ESLA	Both	Yes	No

EXP12SX SAS Storage Enclosure	22G	ESLL	Both	Yes	No
EXP24SX SAS Storage Enclosure	22G	ESLS	Both	Yes	No
3.72TB Mainstream SAS 4k SSD	22G	ESM8	Support	Yes	No
3.72TB Mainstream SAS 4k SSD	22G	ESMQ	Support	Yes	No
775GB Enterprise SAS 4k SFF2	22G	ESNA	Both	Yes	No
775GB Enterprise SAS 4k SFF3	22G	ESNC	Both	Yes	No
1.55TB Enterprise SAS 4kSFF2	22G	ESNE	Both	Yes	No
1.55TB Enterprise SAS 4kSFF3	22G	ESNG	Both	Yes	No
283GB 15K SAS SFF-3 4k HDD	22G	ESNJ	Both	Yes	No
300GB 15K SAS SFF-3 4k HDD	22G	ESNK	Both	Yes	No
300GB 15K SAS SFF-2 4k HDD	22G	ESNM	Both	Yes	No
600GB 15K SAS SFF-3 4k HDD	22G	ESNP	Both	Yes	No
600GB 15K SAS SFF-2 4k HDD	22G	ESNR	Both	Yes	No
Quantity 150 of #ESNM 300GB	22G	ESPM	Both	Yes	No
Quantity 150 of #ESNR 600GB	22G	ESPR	Both	Yes	No
Quantity 150 of ESB2 387GB	22G	ESQ2	Both	Yes	No
Quantity 150 of ESB6 775GB	22G	ESQ6	Both	Yes	No
Quantity 150 of ESBA 387GB	22G	ESQA	Both	Yes	No
Quantity 150 of ESBG 775GB	22G	ESQG	Both	Yes	No
Quantity 150 of ESBL 1.55TB	22G	ESQL	Both	Yes	No
1TB Removable Disk Cartridge	22G	EU01	Both	Yes	No
Not available in US, EMEA, and Japan					
RDX USB External Docking	22G	EU04	Both	Yes	No
RDX 320 GB Removable Disk Driv	22G	EU08	Support	Yes	No
Operator Panel LCD Display	22G	EU0B	Both	Yes	No
1.5TB Removable Disk Cartridge	22G	EU15	Support	Yes	No
Cable Ties & Labels	22G	EU19	Both	Yes	No
Order Placed Indicator	22G	EU29	Both	Yes	No
2TB Removable Disk Cartrdg-RDX	22G	EU2T	Both	Yes	No
RDX USB External Docking Sta	22G	EUA4	Both	Yes	No
Standalone USB DVD drive w/c	22G	EUA5	Both	Yes	No
Core Use HW Feature	22G	EUC6	MES	Yes	No
Core Use HW Feature 10	22G	EUC7	MES	Yes	No
BP Post-Sales Service 1 Day	22G	SVBP	Both	Yes	No
Post-Sales Service 1 Day	22G	SVCS	Both	Yes	No

Other Post-Sale Svcs: 1 Day
 22G SVNN Both Yes No

The following are newly announced features on the specific models of the IBM Power Systems 7014 and 7965 machine type:

Description	Model	Feature	Purchase	Minimum	Initial/	RP
Machine type	number	number	price	Maint.	Monthly MES/	CSU MES
				charge	Both/	
					support	

Rack Specify 22G - 2EIA	T00	ER33			Initial	N/A No
	T42				Initial	N/A No

Description	Model	Feature	Purchase	Minimum	Initial/	RP
Machine type	number	number	price	Maint.	Monthly MES/	CSU MES
				charge	Both/	
					support	

Rack Specify 22G - 2EIA	S42	ER33			Initial	N/A No
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RP MES = Return parts, miscellaneous equipment specifications

CSU = Customer setup

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