IBM Power E1050 enterprise midrange technology-based se delivers optimized, cost-effective performance and scale to today's business needs

(Corrections) ⊘

(Corrected on January 12, 2023) ⊘

Modification made to the Overview section.

(Corrected on November 1, 2022) ⊘

Modifications made to the Description, Technical information, Extended warranty service, and General terms and conditions sections.

At a glance ⊘

The IBM Power E1050 server (9043-MRX) is an enhanced enterprise class four-socket, 4U server that provides massive scalability and flexibility. This syste extreme density in an energy-efficient design with superior reliability and resiliency. It will provide enterprise clients with a secure and flexible environment critical and modernization applications to deliver a frictionless hybrid cloud experience.

Power E1050 features include:

– IBM Power10 processor modules with 12, 18, or 24 cores options.
  ▪ Twelve-core processor modules provide up to 48 cores per system typical 3.35--4.0 GHz (max).
  ▪ Eighteen-core processor modules provide up to 72 cores per system typical 3.20--4.0 GHz (max).
  ▪ Twenty-four-core processor modules provide up to 96 cores per system typical 2.95--3.90 GHz (max).
– Enterprise class 4U differential dual in-line memory module (DDIMM) memory technology with enhanced reliability, availability, and serviceability with 25 memory capacity.
  ▪ A two-processor module configuration provides 32 DDIMM slots and a maximum of 8 TB.
  ▪ A three-processor module configuration provides 48 DDIMM slots and a maximum of 12 TB.
  ▪ A four-processor module configuration provides 64 DDIMM slots and a server maximum of 16 TB.
– Peripheral Component Interconnect Express (PCIe) slots.
  ▪ System unit supports up to 11 PCIe Gen5/4 slots.
  ▪ One PCIe Gen4 slot reserved for default Ethernet adapter.
  ▪ PCIe I/O expansion drawers support up to 48 additional PCIe slots.
– Up to ten nonvolatile memory express (NVMe) U.2 drive bays.
– Integrated USB controller provides two front and two rear USB ports.
– Additional storage can be attached.
  ▪ Up to 1,536 SFF-2 bays for hard disk drives (HDDs) and solid-state drives (SSDs) with 64 EXP24SX I/O drawers.
  ▪ Fibre Channel (FC) and local area network (LAN) adapters.
– Enterprise Base Machine Controller (eBMC) managed
– Titanium power supplies to meet the most stringent regulations on Power Supply Efficiency
– IBM Power Private Cloud with Dynamic Capacity (Elastic Capacity on Demand and Power Enterprise Pools 2.0).
– IBM Power to Cloud Rewards Program for IBM Lab Services engagements.
– Active Memory Expansion (AME) and Active Memory Mirroring (AMM) for Hypervisor.
– Packaged in a standard 19-inch rack mount 4U drawer.
– Support for IBM AIX, Linux and VIOS operating systems.
– Standard three-year warranty with IBM Power Expert Care services

Overview 🔗

Power enterprise servers combines cloud management with leadership performance, scale, reliability, availability, and security to efficiently run the most da critical workloads.

The new Power E1050 (9043-MRX) server is designed to improve scale performance and security while delivering class-leading reliability. This design respo demands, protects data from core to cloud, and streamlines insights and automation. The enterprise family of systems can help deliver business agility by e workloads across a hybrid cloud with increased flexibility.

- **Respond faster to business demands:** The Power10 processor delivers higher levels of performance as compared to IBM Power9 for the same workload energy or carbon footprint, enabling more efficient scaling. Power Private Cloud with Dynamic Capacity includes metering of Linux, OpenShift, and AIX env consumption consistently across public, private, and hybrid cloud when combined with the Power E1050.
- **Protect data from core to cloud:** You can support end-to-end security with simplified encryption using memory encryption at the processor level--witho overhead or performance impact. Power10 can also help you to stay ahead of future threats with support for post-quantum cryptography and fully homor
- **Streamline insights and automation:** You can deduce insights faster as compared to Power9 from enhanced in-core AI inferencing capability with no add hardware required. You can extract insights from your most sensitive data where it resides, eliminating the time and risk of data movement.
- **Maximize availability and reliability:** You can help ensure your business stays up and running with built-in advanced recovery and self-healing for infrast disaster recovery (DR) in IBM Cloud.

The Power E1050 server includes the following additional software and services:

- **IBM Cloud Management Console (CMC) for Power.** CMC is a cloud-native platform that provides apps that give powerful insights into your Power infrastr centers and geographies. With no additional software or infrastructure setup, you can get single pane of glass views of your inventory, software levels, res utilization, as well as launch-in-context of your on-premises software, such as IBM PowerVC and IBM PowerHA. Each new Power E1050 server purchase CMC service, which can be renewed. For more information, visit IBM Cloud Management Console website.
- **Open source cloud automation and configuration tooling for AIX.** IBM has expanded its commitment to keep key open source cloud management pack provide timely security fixes to enable you to leverage open source skills. The Power E1050 enables you to take advantage of key packages to enable clou
  - *chef* automation for configuration, deployment, and management. IBM is collaborating with clients in this community to provide useful resources for us systems.
  - *yum* package management is available with repository access from both ftp and https protocols. rpm is also updated to enable automatic dependency
  - *cloud-init* and all dependencies are available in the repository and includes support for licensed AIX users. For more information, see the AIX Toolbox Software website.
- **Securely connect system-of-record workloads and data-to-cloud native applications.** IBM API and IBM WebSphere Connect provide secure connectiv applications, giving you the ability to rapidly develop new applications and services, thereby helping accelerate your time to value. IBM's Power to Cloud s started with these solutions and in designing new applications that leverage IBM Cloud. Cloud enables you to rapidly build, deploy, and manage your clou tapping a growing ecosystem of available services and runtime frameworks. To learn more about all the new cloud capabilities that come with the Power I IBM Power Enterprise Cloud Index website.
- **eBMC** is built on Open BMC Linux Foundation Project, with industry collaboration and industry-standard APIs.
- **Power to Cloud Rewards Program.** The Power to Cloud Rewards Program helps you design, build, and deliver cloud platforms on Power. Clients purchasi server earn 5,000 IBM Power to Cloud Reward Program points per system. The points can be used for a range of services to transform traditional IT platfo hybrid cloud platforms. Power to Cloud Reward Program service offerings leverage the proven expertise of IBM Systems Lab Services consultants. Visit ib contact your IBM representative, IBM Business Partner, or ibmsls@us.ibm.com for full program details.

Power E1050 hardware components

The Power E1050 server delivers a high-performing and reliable four-socket system, with simultaneous multithreading of up to eight threads per core (SMT server's Power10 dual-chip module delivers 409 GB/sec of memory bandwidth per socket. I/O bandwidth is also increased to double that of the predecesso the introduction of PCIe Gen5 integrated controllers.

The Power E1050 server utilizes the following Power10 processor options:

- Twelve-core with up to 48 cores typical 3.35--4.0 GHz (max)
- Eighteen-core with up to 72 cores typical 3.2--4.0 GHz (max)
- Twenty-four-core with up to 96 cores typical 2.95--3.90 GHz (max)

A minimum of two processor modules must be installed in each system, with a minimum quantity of one processor module's cores activated.

A Power E1050 server supports the following memory options:

- 64 GB (2x32GB) DDR4 DDIMMs, or

- 128 GB (2x64GB) DDR4 DDIMMs, or
- 256 GB (2x128GB) DDR4 DDIMMs, or
- 512 GB (2x256GB) DDR4 DDIMMs

E1050 provides 16 DDIMMs per socket to enable a maximum configuration of 16 TB. Minimum of 4 DDIMMs per socket must be installed.

A minimum of 50% or 256 GB, whichever is higher, of installed memory must be activated.

The PCIe capabilities provide up to 11 PCIe slots:

- Two PCIe Gen5 x8
- Three PCIe Gen4 x8
- Six PCIe Gen4 x16 or Gen5 8x

PCIe slots support concurrent maintenance (hot plug).

Additional PCIe adapters can be attached through up to four PCIe I/O expansion drawers, providing up to 48 additional PCIe Gen3 slots.

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

The Power E1050 server comes standard with phase-redundant power regulators for processors, memory, disk, and I/O. Hot-plug, redundant power supplie of-day battery are also standard, and AMM for Hypervisor is available as an option.

Key requirements ⊘

One of the following operating systems is required:

- AIX
- Linux: Red Hat Enterprise Linux (RHEL) or SUSE Linux Enterprise Server (SLES)

For more information, see the Hardware requirements section and Software requirements section.

Planned availability date ⊘

July 22, 2022

July 26, 2022, for the software enablement for Power E1050 Healthcare Solution Edition

November 18, 2022, for the following feature: 512 GB (2 x 256 GB) DDIMM Memory (#EM7J)

Availability within a country is subject to local legal requirements.

Description ⊘

Power E1050 feature summary

The following features are available on the new Power E1050 server:
- The Power E1050 supports 24 to 96 processor cores with two to four Power10 processor modules.
- The Power E1050 delivers 256 GB--16 TB high-performance DDR4 memory.
- Each Power E1050 server can support up to 10 NVMe U.2 storage devices.
- Up to 11 hot-swap PCIe slots in the system unit:
  - 6 PCIe Gen5 x8 or Gen4 x16 slots.
  - 3 PCIe Gen4 x8 slots.
  - 2 PCIe Gen5 x 8 slots.
  - With two processor modules, there are seven PCIe slots; with three modules and four modules, there are eleven PCIe slots.
- The PCIe I/O Expansion Drawer (#EMX0) expands the number of full-high, hot-swap slots:
  - Up to two PCIe drawers with two processor modules (maximum 31 slots on the server).
  - Up to three PCIe drawers with three processor modules (maximum 41 slots on the server).
  - Up to four PCIe drawers with four processor modules (maximum 51 slots on the server).

- Up to 64 EXP24SX SFF Drawers (#ESLS) can be attached, providing up to 1,536 SAS bays for disks or SSDs.
- System unit I/O (integrated I/O):
  - USB 3.0 ports: four 3.0 ports, two front and two rear.
  - USB 2.0 ports: two rear 2.0 ports for limited use.
  - HMC ports: two 1 GbE RJ45.
- Four hot-plug and redundant power supplies 2300 W (200--240 V AC) (#EB39).
- System unit only 4U in a 19-inch rack-mount hardware.
- Primary operating systems:
  - AIX (#2146): small-tier licensing.
  - Linux (#2147): RHEL and SLES.

Processor modules

- The Power E1050 supports 24 to 96 processor cores:
  - Twelve-core typical 3.35--4.0 GHz (max) #EPEU Power10 processor.
  - Eighteen-core typical 3.20--4.0 GHz (max) #EPEV Power10 processor.
  - Twenty-four-core typical 2.95--3.90 GHz (max) #EPGW Power10 processor.
- A minimum of two and a maximum of four processor modules are required for each system. The modules can be added to a system at a later time through
  will require scheduled downtime to install. All processor modules in one server must be the same gigahertz (same processor module feature number). Th
- Permanent CoD processor core activations are required for the first processor module in the configuration and are optional for the second, third, and fourt
  - Two, three, or four 12-core, typical 3.35--4.0 GHz (max) processor modules (#EPEU) require 12 processor core activations (#EPUR) at a minimum.
  - Two, three, or four 18-core, typical 3.20--4.0 GHz (max) processor modules (#EPEV) require 18 processor core activations (#EPUS) at a minimum.
  - Two, three, or four 24-core, typical 2.95--3.90 GHz (max) processor modules (#EPGW) require 24 processor core activations (#EPYT) at a minimum.
- Temporary CoD capabilities are optionally used for processor cores that are not permanently activated:
  - An HMC is required for temporary CoD.

System memory

- 256 GB--16 TB high-performance up to 3200 MHz DDR4 OMI memory:
  - 64 GB DDR4 (2 x 32GB DDIMM's) Memory (#EM75).
  - 128 GB DDR4 (2 x 64GB DDIMM's) Memory (#EM76).
  - 256 GB DDR4 (2 x 128GB DDIMM's) Memory (#EM77).
  - 512 GB DDR4 (2 x 256GB DDIMM's) Memory (#EM7J).
  - Optional Active Memory Expansion (#EMBM).
- As your memory requirements increase, the system capabilities are increased as follows:
  - With two processor modules installed, 32 DDIMM slots are available; minimum memory is 256 GB.
  - With three processor modules installed, 48 DDIMM slots are available; minimum memory is 384 GB.
  - With four processor modules installed, 64 DDIMM slots are available; minimum memory is 512 GB. Sixteen DDIMMs are available per socket.
  - The more DDIMM slots that are filled, the larger the available bandwidth available to the server.
    Permanent CoD memory activations are required for at least 50% of the physically installed memory or 256 GB of activations, whichever is larger. Use
    and 100 GB activation (#EMCQ) features to order permanent memory activations.
- Temporary CoD for memory is available for memory capacity that is not permanently activated:
  - Delivery through Virtual Capacity machine type/model (MTM) (4586-COD) using Entitled Systems Support (ESS) process.
  - An HMC is required for temporary CoD.

Notes:

- A memory feature code consists of 2 DDIMMs.
- The Minimum memory orderable is 4 DDIMMs per processor socket.
- For 2-socket system, minimum memory orderable is 8 DDIMMs.
- For 3-socket system, minimum memory orderable is 12 DDIMMs.
- For 4-socket system, minimum memory orderable is 16 DDIMMs.
- Next memory increment is multiple of 4 DDIMMs.
- All DDIMMs belong to a processor must be of same size and type, i.e. same feature code.
- Each processor socket can have different total memory capacity from other processor sockets.
- The minimum memory supported per two Power10 processors installed is 256 GB.

- The minimum memory supported per three Power10 processors installed is 384 GB.
- The minimum memory supported per four Power10 processors installed is 512 GB.

Storage options

The Power E1050 supports up to ten NVMe 7-milimeter or 15-milimeter drives:

- Six NVMe drives within two or three-socket configuration
- Ten NVMe drives within a four-socket configuration

All NVMe drives are driven directly from the system backplane with no PCIe card or cables required.

The 7-millimeter NVMe drives from the IBMPower E950 are also supported on the Power E1050 with a carrier conversion feature that is offered to hold thes

Power Private Cloud Solution with Dynamic Capacity

The Power Private Cloud Solution with Dynamic Capacity is an infrastructure offering that enables you to take advantage of cloud agility and economics whil business continuity and flexibility that you already enjoy from Power servers. The Power Private Cloud Solution offers:

- Cost optimization with pay-for-use pricing
- Automated and consistent IT management with Red Hat Ansible® for Power
- IBM Proactive Support for Power services
- IBM Systems Lab Services Assessment and implementation assistance

Both Elastic and Shared Utility Capacity options are now available on all Power E1050 systems through the Virtual Capacity (4586-COD) MTM and the ESS w

Elastic Capacity on the Power E1050 system enables you to deploy pay-for-use consumption of processor, memory, and supported operating systems, by th collection of Power E1050 and Power E950 systems.

Shared Utility Capacity on Power E1050 systems provides enhanced multisystem resource sharing and by-the-minute tracking and consumption of compute collection of systems within a Power Enterprise Pools (2.0). It delivers a complete range of flexibility to tailor initial system configurations with the right mix for-use consumption of processor, memory, and software. Clients with existing Power Enterprise Pools of Power E950 systems can simply add Power E1050 and migrate to them at the rate and pace of their choosing, as any Power E950 and Power E1050 server may seamlessly interoperate and share compute re pool.

A Power Private Cloud Solution infrastructure consolidated onto Power E1050 systems has the potential to greatly simplify system management so IT team optimizing their business results instead of moving resources around within their data center.

Shared Utility Capacity resources are easily tracked by virtual machine (VM) and monitored by a CMC, which integrates with local HMCs to manage the pool by system and VM, by the minute, across a pool.

You no longer need to worry about overprovisioning capacity on each system to support growth, as all available processor and memory on all systems in a p available for use.

Base Capacity for processor, memory, and supported operating system entitlement resources is purchased on each Power E950 and Power E1050 system a across a defined pool of systems for consumption monitoring.

Metered Capacity is the additional installed processor and memory resource above each system's Base Capacity. It is activated and made available for imme is started, then monitored by the minute by a CMC.

Metered resource usage is charged only for minutes exceeding the pool's aggregate Base resources, and usage charges are debited in real-time against you Credits (5819-CRD) on account.

IBM offers a Private Cloud Capacity Assessment and Implementation Service performed by Systems Lab Services professionals, which can be preselected a requested for qualifying Power E1050 servers.

I/O support

PCIe slots

The Power E1050 server has up to eight PCIe Gen5 and three PCIe Gen4 general purpose hot-plug slots, providing configuration flexibility and expandability x16 Gen5/4, two adapter slots are x8 Gen5, and three adapter slots are x8 Gen4 . All adapter slots are full height, half length.

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

Processor modules	2 socket	3/4 socket
x16 Gen4 or x8 Gen5 slots	2	6
x8 Gen4 slots	3	3
x8 Gen5 slots	2	2

Notes:

– The PCIe Genx8 slot, C1, is reserved for an Ethernet adapter to help ensure proper manufacture and test of the server.

– Blind-swap cassettes (BSC) are used for adapters in the system unit.

– All PCIe slots in the system unit are single root I/O virtualization (SR-IOV) capable.

– Each NVMe SSD interface is a Gen4 x4 PCIe bus. The NVMe drives can be in an OS-controlled RAID0, RAID1 array. Hardware RAID is not supported on the

The x16 slots can provide up to twice the bandwidth of x8 slots because they offer twice as many PCIe lanes. PCIe Gen5 slots can support up to twice the b Gen4 slot and up to four times the bandwidth of a PCIe Gen3 slot, assuming an equivalent number of PCIe lanes. PCIe Gen1, PCIe Gen2, PCIe Gen3, PCIe G adapters can be plugged into a PCIe Gen5 slot, if that adapter is supported. The x16 slots and selective x8 slots can be used to attach PCIe Gen3 I/O expan

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

USB DVD external and boot devices

The Power E1050 provides two front USB ports, mainly to support the external USB DVD.

System boot is supported through these options:

1. NVMe drives
2. A SAN attached to FC or FCoE adapters and indicated to the server by the 0837 specify code
3. USB front port for external USB-based DVD
4. USB front port for USB memory key/flash drive

Assuming option 1 above, the minimum system configuration requires at least one NVMe disk drive in the system for AIX and Linux.

I/O drawer attachment

Clients migrating from earlier-generation servers may have been using I/O drawers such as the GX++ attached feature 5802 or feature 5877 PCIe 12X I/O slots. Though most PCIe adapters in the feature 5802 or feature 5877 drawers can be moved to this server and its disk drives converted and moved to the fo drawer, the feature 5802 and feature 5877 drawers are not supported on this newer Power technology-based server. Similarly, the GX++ attached EXP30 U or #5888) is not supported.

Up to 64 EXP24SX storage drawers can be attached to a Power E1050 server. With 24 drives per drawer, this means up to 1,536 SFF-2 drives are supported EXP24SX per PCIe Gen3 I/O drawer is supported due to cable management considerations.

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

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

PCIe I/O expansion drawer

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

– Up to two PCIe drawers with two processor modules.

– Up to three PCIe drawers with three processor modules.

– Up to four PCIe drawers with four processor modules.

– The 19-inch 4 EIA (4U) PCIe I/O Expansion Drawer (#EMX0) and two PCIe fanout modules (#EMXH) provide 12 PCIe I/O full-length, full-height slots. One provides six PCIe slots labeled C1 through C6. Slots C1 and C4 are x16 slots, and C2, C3®, C5, and C6 are x8 slots. All six slots in a PCIe3 6-slot fanout mc enabled. The feature EC2S and feature EC2U adapters are supported in slots C1 through C6, but only four feature EC2S and feature EC2U adapters can be at a time.

– An EMX0 drawer can be configured with one or two EMXH fanout modules. Adding a second fanout module is not a hot-plug operation and requires sched

- PCIe Gen1, Gen2, and Gen3 full-high adapter cards are supported. The set of full-high PCIe adapters that are supported is found in the Sales Manual, ide[...] number. See the PCI Adapter Placement manual for the Power E1050 for details and rules associated with specific adapters supported and their supporte[...] x16 slots.
- Each fanout module requires one PCIe Cable Adapter (#EJ2A), which is placed in a x16 PCIe slot and selective x8 slots of the system unit.
- A cable pair attaches the PCIe Cable Adapter (#EJ2A) to the fanout module. Feature ECC7 provides a pair of 3-meter optical cables with transceivers. Fea[...] pair of 10-meter optical cables with transceivers. Feature ECCS provides a pair of 3-meter copper cables. Two cables of identical length, or one feature, is [...] fanout module. Optical cables are smaller diameter and more flexible and can be longer than the copper cables. Copper cables are lower cost. Copper an[...] same performance and reliability characteristics.
- The cable adapter (#EJ2A) can be placed in any of the system units' available x16 slots and selective x8 slot and attached to any fanout module in any of [...] drawers (#EMX0). The PCIe I/O drawer cannot be shared by two different servers.
- *Recommendation:* Locate any attached PCIe I/O expansion drawer in the same rack as the Power10 server for ease of service. However, the drawers can [...] racks if the application or other rack content requires it. It is recommended to use 3-meter cables for PCIe drawers in the same rack as the system unit ar[...] drawers located in a different rack.
- Concurrent repair and add/removal of PCIe adapter cards is done by HMC-guided menus or by operating system support utilities.
- When the operating system is Linux, PowerVM® is required for support of the I/O expansion drawer.

Rack cable brackets

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

Integrated I/O ports

E1050 integrated IO consists of four Operating System (OS) USB 3.0 port and those of the service processor eBMC. Two of the four OS USB 3.0 ports are at [...] rear physically on the eBMC card tailstock. The front OS USB 3.0 ports have higher current capacity than the two rear USB 3.0. The front USB 3.0 ports are ty[...] external DVD drive and for other general USB devices such as USB key. The two rear USB 3.0 are typical used for general USB devices such as USB key. Do n[...] port for external DVD drive.

The eBMC integrated IO consists of two Ethernet RJ45 ports and two USB 2.0 ports. All these ports are at the eBMC card tailstock, together with 2 OS USB [...]

The two eBMC Ethernet are typically used for HMC connection, one for the primary HMC and the other could be used for an HMC secondary.

When HMC is not used, one of the Ethernet ports is typically connected to a network so that eBMC interface can be used to control and manage the system [...] Redfish interface or command line .

The eBMC two USB2.0 can be used for USB key to update eBMC code or for Uninterruptible Power System (UPS) control cable. For UPS application, a conve[...] ECCF, provides a USB-to-9-pin, D-shell connection to some UPS. The IBM 9910 Uninterruptible Power System, models E66 and E67, are supported as purc[...] Power E1050 server.

Racks

The Power E1050 server is designed to fit a standard 19-inch rack. IBM Development has tested and certified the system for the following rack support:
- 7965-S42 (42U): field integration only
- 7014-T42 (42U): supported only

Clients can choose to place the server in other racks if they are confident those racks have the strength, rigidity, depth, and hole-pattern characteristics that [...] should work with IBM Service to determine the appropriateness of other racks. The Power E1050 rails can adjust their depth to fit a rack that is 22.75 inche[...] based on the adjustable outer brackets going from the front rail to the rear rail.

IBM Manufacturing does not support the use of other racks with the Power E1050 initial system order or model upgrade. The 7965-S42 (#ECR0) or 7014-T[...] enterprise racks that provide 42U or 42 EIA of space.

Additional Power E1050 PCIe I/O Drawers (#EMX0) for an already-installed server can be MES ordered with or without a rack.

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

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

PDUs

Using previously provided IBM PDU features 7188, 7109, and 7196 reduces the number of Power E1050 servers and other equipment that can be held mos
The high-function PDUs provide more electrical power per PDU and thus offer better PDU footprint efficiency. In addition, they are intelligent PDUs that prov
power usage by receptacle and also provide remote power on/off capability for easier support by individual receptacle. The new PDUs are features ECJJ, EC

IBM Manufacturing will only integrate the newer PDUs with the Power E1050 server. IBM Manufacturing does not support integrating earlier PDUs, such as t
or 7196. You can choose to use older IBM PDUs in your racks, but you will have to install those earlier PDUs at your site.

	1-phase or 3-phase wye, depending on country wiring standards	3-phase 208 V, depending on country wir
Nine C19 receptacles	#ECJJ	#ECJL
Twelve C13 receptacles	#ECJN	#ECJQ

– *High-Function 9 x C19 PDU: Switched, Monitoring (#ECJJ)*. This is an intelligent, switched 200--240 V AC PDU with nine C19 receptacles on the front of t
  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
  PDU is single-phase or three-phase wye. The PDU can be mounted vertically in rack side pockets, or it can be mounted horizontally. If mounted horizontal
  rack space. Device power cords with a C20 plug connect to C19 PDU receptacles and are ordered separately. One country-specific wall line cord is also or
  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, 665
– *High-Function 9 x C19 PDU 3-Phase: Switched, Monitoring (#ECJL)*. This is an intelligent, switched 208 V three-phase AC PDU with nine C19 receptacles
  The PDU is mounted on the rear of the rack, making the nine C19 receptacles easily accessible. Each receptacle has a 20-amp circuit breaker. The PDU ca
  in rack side pockets, or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. Device power cords with a C20 plug conn
  receptacles and are ordered separately. One wall line cord is provided with the PDU (no separate feature number) and has an IEC60309 60A plug (3P+G).
  48 amps. 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 o
  shipped with a generic PDU password, and IBM strongly urges clients to change it upon installation.
– *High-Function 12 x C13 PDU: Switched, Monitoring (#ECJN)*. This is an intelligent, switched 200--240 V AC PDU with twelve C13 receptacles on the front
  mounted on the rear of the rack, making the twelve C13 receptacles easily accessible. Each receptacle has a 20-amp circuit breaker. Depending on count
  PDU is single-phase or three-phase wye. The PDU can be mounted vertically in rack side pockets, or it can be mounted horizontally. If mounted horizontal
  rack space. Device power cords with a C14 plug connect to C13 PDU receptacles and are ordered separately. One country-specific wall line cord is also or
  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, 665
  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 s
  PDU password, and IBM strongly urges clients to change it upon installation.
– *High-Function 12 x C13 PDU 3-Phase: Switched, Monitoring (#ECJQ)*. This is an intelligent, switched 208 V three-phase AC PDU with twelve C13 recepta
  PDU. The PDU is mounted on the rear of the rack, making the twelve C13 receptacles easily accessible. Each receptacle has a 20-amp circuit breaker. The
  vertically in rack side pockets, or it can be mounted horizontally. If mounted horizontally, it uses 1 EIA (1U) of rack space. Device power cords with a C14 |
  receptacles and are ordered separately. One wall line cord is provided with the PDU (no separate feature number) and has a IEC60309 60A plug (3P+G).
  48 amps. 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 o
  shipped with a generic PDU password, and IBM strongly urges clients to change it upon installation.

Lifting considerations

Three to four service personnel are required to manually remove or insert a system unit into a rack, given its dimensions, weight, and content. To avoid the r
people to assemble at your site for a service action, a lift tool can be very useful. If you have chosen to install this customer setup (CSU) system, similar liftir

The Power E1050 server has a maximum weight of 69 kilograms (153 pounds). However, by temporarily removing the power supplies, fans, and RAID asser
reduced to a maximum of 55 kilograms (121 pounds).

When lowering the Power E1050 server onto its rails in the rack, the server must be tilted on one end about 15 degrees so that the pins on the server enclos
This equates to lifting one end of the server about 4 centimeters (1.6 inches). This can be done using a tip plate on a lift tool or manually adjusting the load ‹
during the manual lift. Consider the optional feature EB2Z lift tool.

PowerVM Enterprise Edition License Entitlement is now included with each Power E1050 server.

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

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

With LPM, you can move a running AIX or Linux VM from one physical server to another with no downtime. You can use this capability to:

– Evacuate workloads from a system before performing scheduled maintenance.
– Move workloads across a pool of different physical resources as business needs shift.
– Move workloads away from underutilized machines so that they can be powered off to save on energy and cooling costs.
– Move your workloads to new Power10 systems for upgrades without having to schedule an outage. With Active Memory Sharing, memory is dynamically n partitions for optimal resource usage.

Active Memory Expansion

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

AME uses CPU resource to compress or decompress the memory contents. The trade-off of memory capacity for processor cycles can be an excellent choic expansion varies on how compressible the memory content is. It also depends on having adequate spare CPU capacity available for this compression or dec

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

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

A planning tool is included with AIX, enabling you to sample actual workloads and estimate both how expandable the partition's memory is and how much C Any Power model can run the planning tool. In addition, a one-time, 60-day trial of AME is available to enable more exact memory expansion and CPU meas request the trial using the Power Capacity on Demand website.

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

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

IBM Power E1050 Solution Edition for Healthcare

The Power E1050 Solution Edition for Healthcare provides a cost-effective up to 96-core processor and 16 TB memory solution for eligible healthcare indus approved ISV applications, such as Epic.

– Solution Edition for Healthcare 24-core typical 2.95--3.90 GHz processor (#EHC8)
– Processor Activations (24) for #EHC8 (#EPYT)
– No-cost Processor Activations (#EHCA)
– Memory Activation (512 GB) for #EHC8 (#EMCE)
– No-cost Memory Activation (512 GB) (#EHCB)

The Power E1050 Solution Edition for Healthcare minimum requirement is a server with 2x typical 2.95--3.90 GHz processor modules, 48 cores (all active), active).

> ℹ️ **Note:** For every purchased Processor Activation #EPYT, get one free activation #EHCA up to the max in the table below. Additional #EPYT may be p #EHC8 required.

Sockets	Required feature EHC8	Processor Activation #EPYT		Free Processor Activation of #EHCA	Total maximum Proce
		Min	Max		
2	2	24	24	up to 24	up to 48
3	3	24	36	up to 36	up to 72
4	4	24	48	up to 48	up to 96

Sockets	Required feature EHC8	Memory Activation #EMCE		Free Memory Activation of #EHCB	Total maximum Mem
		Min	Max		
2	2	1	2	up to 2	up to 2 TB
3	3	1	3	up to 3	up to 3 TB
4	4	1	4	up to 4	up to 4 TB

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

Reliability, Availability, and Serviceability 🔗

Reliability, 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 proc
through rigorous verification and integration testing processes. During system manufacturing, systems go through a thorough testing process to help ensure
product quality.

The Power10 processor-based E1050 system comes with the following RAS characteristics:
– Power10 processor RAS
– Open Memory Interface, differential DIMMs RAS
– Enterprise BMC service processor for system management and service
– Active Memory Mirroring for Hypervisor
– NVMe drives concurrent maintenance
– PCIe adapters concurrent maintenance
– Redundant and hot-plug cooling
– Redundant and hot-plug power
– Redundant voltage regulators
– Time-of-day battery concurrent maintenance
– Lightpath enclosure and FRU LEDs
– Service and FRU labels
– Client or IBM install
– Proactive support and service -- call home
– Client or IBM service

Service processor

The Power10 processor-based E1050 system comes with a redesigned service processor based on a Baseboard Management Controller (BMC) design with
accessible through open-source industry standard APIs, such as Redfish. An upgraded ASMI web browser user interface preserves the required RAS functic
user to perform tasks in a more intuitive way.

Diagnostic monitoring of recoverable error from the processor chipset is performed on the system processor itself, while the fatal diagnostic monitoring of tl
performed by the service processor. It runs on its own power boundary and does not require resources from a system processor to be operational to perforr

The service processor supports surveillance of the connection to the HMC and to the system firmware (hypervisor). It also provides several remote power co
environmental monitoring, reset, restart, remote maintenance, and diagnostic functions, including console mirroring. The BMC service processors menus (A
concurrently during system operation, allowing nondisruptive abilities to change system default parameters, view and download error logs, check system he

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

Mutual surveillance

The service processor monitors the operation of the firmware during the boot process and also monitors the hypervisor for termination. The hypervisor mon[...] 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[...] processor.

Environmental monitoring functions

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

Memory subsystem RAS:

The Power10 processor-based E1050 system introduces a new 4U tall differential DIMM (DDIMM), which has new open CAPI memory interface known a[...] fast communication to the processor. This new memory subsystem design delivers solid RAS as described below.

– **Memory Buffer:** The DDIMM contains a memory buffer with key RAS features, including protection of critical data/address flows using CRC, ECC, and pari[...] engine for background memory scrubbing and memory diagnostics, and a Fault Isolation Register (FIR) structure, which enables firmware attention-base[...] diagnostics.

– **OMI (Open Memory Interface):** The OMI interface between the memory buffer and processor memory controller is protected by dynamic lane calibratior[...] retry/recovery facility to retransmit lost frames to survive intermittent bit flips. A complete lane fail can also be survived by triggering a dynamic lane redu[...] independently for both up and downstream directions. A key advantage of the OMI interface is that it simplifies the number of critical signals that must cr[...] processor to memory compared to a typical industry-standard DIMM design.

– **Memory ECC:** The DDIMM includes a robust 64-byte Memory ECC, with 8-bit symbols, capable of correcting up to five symbol errors (one x4 chip and one[...] well as retry for data and address uncorrectable errors.

– **Dynamic row repair:** To further extend the life of the DDIMM, the dynamic row repair feature can restore full use of a DRAM for a fault contained to a DRA[...] continues to operate.

– **Spare temperature sensors**: Each DDIMM provides spare temperature sensors, such that the failure of one does not require a DDIMM replacement.

– **Spare DRAMs:** 4U DDIMMs include two spare x4 memory modules (DRAMs) per rank. These can be substituted for failed DRAMs during runtime operatio[...] correction, the 2 spares allow the 4U DDIMM to continue to function with 3 bad DRAMs per rank, compared to 1 (single device data correct) or 2 (double c[...] DRAMs in a typical industry standard DIMM design. This extends self-healing capabilities beyond what is provided with dynamic row repair capability.

– **Spare power management integrated circuits (PMICs)**: 4U DDIMMs include PMICs such that the failure of one PMIC does not require a DDIMM replacer[...]

Power10 processor functions

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

Cache availability

The L2/L3 caches in the Power10 processor in the memory buffer chip are protected with double-bit detect, single-bit correct error detection code (ECC). Ir[...] 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[...] 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 er[...] 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,[...] and determines whether it will ever be used again. If the error is irrelevant, it will not force a check stop. When and if data is used, I/O adapters controlled b[...] would freeze if data were transferred to an I/O device, otherwise, termination may be limited to the program/kernel or if the data is not owned by the hyperv[...]

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 firm[...] 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 freque[...] 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 environmenta[...] failure.

Serviceability

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

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

– Design for SSR setup, install, and service
– Error Detection and Fault Isolation (ED/FI)
– First Failure Data Capture (FFDC)
– Light path service indicators
– Service and FRU labels available on the system
– Service procedures documented in IBM Documentation or available through the HMC
– Automatic reporting of serviceable events to IBM through the Electronic Service Agent Call Home application

Service environment

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

The Power10 processor-based systems support several service environments:

– Attachment to one or more HMCs or vHMCs is a supported option by the system with PowerVM. This is the default configuration for servers supporting log dedicated or virtual I/O. In this case, all servers have at least one logical partition.
– No HMC. There are two service strategies for non-HMC systems.
  ▪ Full-system partition with PowerVM: A single partition owns all the server resources and only one operating system may be installed. The primary servi the operating system and the service processor.
  ▪ Partitioned system with NovaLink: In this configuration, the system can have more than one partition and can be running more than one operating syste interface is through the service processor.

Service interface

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

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

– LEDs
– Operator panel
– BMC Service Processor menu
– Operating system service menu
– Service Focal Point on the HMC or vHMC with PowerVM

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

First Failure Data Capture and error data analysis

First Failure Data Capture (FFDC) is a technique that helps ensure that when a fault is detected in a system, the root cause of the fault will be captured witho 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 a 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 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 Design.
– Provide interactive intelligence within the diagnostics with detailed online failure information while connected to IBM's backend system.

Automatic diagnostics

The processor and memory FFDC technology is designed to perform without the need for recreate diagnostics nor require user intervention. Solid and intermitted designed to be correctly detected and isolated at the time the failure occurs. Runtime and boot-time diagnostics fall into this category.

Standalone diagnostics

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

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

Concurrent maintenance

The determination of whether a firmware release can be updated concurrently is identified in the readme information file that is released with the firmware. the concurrent firmware update with PowerVM. In addition, concurrent maintenance of PCIe adapters and NVMe drives are supported with PowerVM. Powe pluggable.

Service labels

Service providers use these labels to assist them in performing maintenance actions. Service labels are found in various formats and positions and are inten 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. Locati include location codes, drawings of physical locations, concurrent maintenance status, or other data pertinent to a repair. Location diagrams are especiall components such as DIMMs, processors, fans, adapter cards, and power supplies are installed.
– Remove/replace procedures: Service labels that contain remove/replace procedures are often found on a cover of the system or in other spots accessible 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 latc 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 i 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 processor-based systems that contains each MTM service functions of interest while physically located at the server. These include things such as installatio instructions, reference code look up, and so on.

Packaging for service

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

– Color coding (touch points): Blue-colored touch points delineate touchpoints on service components where the component can be safely handled for serv 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 dr hardware components.
– Positive retention: Positive retention mechanisms help to assure proper connections between hardware components such as cables to connectors, and be attach to each other. Without positive retention, hardware components run the risk of becoming loose during shipping or installation, preventing a good el Positive retention mechanisms like latches, levers, thumbscrews, pop Nylatches (U-clips), and cables are included to help prevent loose connections and 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 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 to operate, the error will be reported to the operating system. Hardware and software failures are recorded in the system log filesystem. When an HMC is att 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

isolated a likely cause of the system problem. The service processor event log also records unrecoverable checkstop conditions, forwards them to the SFP a 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 a sent to an IBM service organization. Customer contact information and specific system-related data such as the machine type, model, and serial number, al related to the failure, are sent to IBM Service.

Live Partition Mobility

With PowerVM Live Partition Mobility (LPM), users can migrate an AIX, IBM I, or Linux VM partition running on one Power partition system to another Power disrupting services. The migration transfers the entire system environment, including processor state, memory, attached virtual devices, and connected use continuous operating system and application availability during planned partition outages for repair of hardware and firmware faults. The Power10 systems, technology, support secure LPM, whereby the VM image is encrypted and compressed prior to transfer. Secure LPM uses on-chip encryption and compressic Power10 processor for optimal performance.

Call home

Call home refers to an automatic or manual call from a client location to the IBM support structure with error log data, server status, or other service-related invokes the service organization in order for the appropriate service action to begin. Call home can be done through the Electronic Service Agent (ESA) imbe through a version of ESA imbedded in the operating systems for non-HMC-managed or A version of ESA that runs as a standalone call home application. Wh is optional, clients are encouraged to implement this feature in order to obtain service enhancements such as reduced problem determination and faster an accurate transmittal of error information. In general, using the call home feature can result in increased system availability. See the next section for specific application.

IBM Electronic Services

Electronic Service Agent and Client Support Portal (CSP) comprise the IBM Electronic Services solution, which is dedicated to providing fast, exceptional sup Electronic Service Agent is a no-charge tool that proactively monitors and reports hardware events such as system errors and collects hardware and softwar Service Agent can help focus on the client's company business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues. In a Connect Cloud web and mobile capability extends the common solution and offers IBM Systems-related support information applicable to servers and stor

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

System configuration and inventory information collected by Electronic Service Agent also can be used to improve problem determination and resolution be IBM support team. As part of an increased focus to provide even better service to IBM clients, Electronic Service Agent tool configuration and activation con system. In support of this effort, a HMC External Connectivity security whitepaper has been published, which describes data exchanges between the HMC a Delivery Center (SDC) and the methods and protocols for this exchange. To read the whitepaper and prepare for Electronic Service Agent installation, see th the IBM Electronic Service Agent.

Benefits: increased uptime

Electronic Service Agent is designed to enhance the warranty and maintenance service by potentially providing faster hardware error reporting and uploadir IBM Support. This can optimize the time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. And 2 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 Agen securely transmit through the internet (HTTPS) to provide clients a single point of exit from their site. Initiation of communication is one way. Activating Elec 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 rec system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge manag knowledge articles are appended to the problem record.

Client Support Portal

Client Support Portal is a single internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. T you to gain easier access to IBM resources for assistance in resolving technical problems.

This web portal provides valuable reports of installed hardware and software using information collected from the systems by IBM Electronic Service Agent. for any system associated with the client's IBM ID.

For more information on how to utilize client support portal, visit the following website or contact an IBM Systems Services Representative:

– https://www.ibm.com/mysupport

Statement of general direction ∅

IBM intends to support SAP HANA on the IBM Power System E1050 (9043-MRX) in production mode, with the following Linux operating systems, followi certification of the environment.

– SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later

– Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later

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

Reference information ∅

For additional information about IBM Power Expert Care, see announcement: A22-0359, dated July 12, 2022

Product number ∅

The following are newly announced features on the specific models of the IBM Power 9043 machine type:

```
                                         Machine  Model    Feature
Description                              type     number   number
IBM Power System E1050                   9043     MRX
OEM Light Manufacturing Order Indicator - EMPTY 9043 MRX 0006 One CSC Billing Unit 9043 MRX 0010 Ten CSC Billing U

AIX Partition Specify                    9043     MRX      0265
Linux Partition Specify                  9043     MRX      0266
UPS Factory Integration Specify          9043     MRX      0373
HMC Factory Integration Specify          9043     MRX      0374
Display Factory Integration Specify      9043     MRX      0375
Reserve Rack Space for UPS               9043     MRX      0376
Reserve Rack Space for HMC               9043     MRX      0377
Reserve Rack Space for Display           9043     MRX      0378
Customer Specified Placement             9043     MRX      0456
Load Source Not in CEC                   9043     MRX      0719
Fiber Channel SAN Load Source Specify    9043     MRX      0837


Custom Service Specify, Rochester Minn, USA   9043  MRX    1140
300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux) 9043 MRX    1953
600GB 10k RPM SAS SFF-2 HDD for AIX/Linux  9043    MRX     1964
Primary OS - AIX                         9043     MRX      2146
Primary OS - Linux                       9043     MRX      2147
Power Cord To PDU/UPS, (100-240V/16A)    9043     MRX      4558
Rack Integration Services: BP only       9043     MRX      4648
Rack Integration Services                9043     MRX      4649
Rack Indicator- Not Factory Integrated   9043     MRX      4650
Rack Indicator, Rack #1                  9043     MRX      4651
Rack Indicator, Rack #2                  9043     MRX      4652
Rack Indicator, Rack #3                  9043     MRX      4653
Rack Indicator, Rack #4                  9043     MRX      4654
Rack Indicator, Rack #5                  9043     MRX      4655
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Description			
Rack Indicator, Rack #6	9043	MRX	4656
Rack Indicator, Rack #7	9043	MRX	4657
Rack Indicator, Rack #8	9043	MRX	4658
Rack Indicator, Rack #9	9043	MRX	4659
Rack Indicator, Rack #10	9043	MRX	4660
Rack Indicator, Rack #11	9043	MRX	4661
Rack Indicator, Rack #12	9043	MRX	4662
Rack Indicator, Rack #13	9043	MRX	4663
Rack Indicator, Rack #14	9043	MRX	4664
Rack Indicator, Rack #15	9043	MRX	4665
Rack Indicator, Rack #16	9043	MRX	4666
Software Preload Required	9043	MRX	5000
PCIe2 4-port 1GbE Adapter	9043	MRX	5899
Power Cord 4.3m (14-ft), Drawer to IBM PDU (250V/10A)	9043	MRX	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9043	MRX	6460
Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A) U. S.	9043	MRX	6469
Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)	9043	MRX	6470
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)	9043	MRX	6471
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)	9043	MRX	6472
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)	9043	MRX	6473
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/13A)	9043	MRX	6474
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)	9043	MRX	6475
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)	9043	MRX	6476
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)	9043	MRX	6477
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)	9043	MRX	6478
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (125V/15A or 250V/10A)	9043	MRX	6488
4.3m (14-Ft) 3PH/32A 380-415V Power Cord	9043	MRX	6489
4.3m (14-Ft) 1PH/63A 200-240V Power Cord	9043	MRX	6491
4.3m (14-Ft) 1PH/60A (48A derated) 200-240V Power Cord	9043	MRX	6492
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)	9043	MRX	6493
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)	9043	MRX	6494
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9043	MRX	6496
Power Cable - Drawer to IBM PDU, 200-240V/10A	9043	MRX	6577
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)	9043	MRX	6651
4.3m (14-Ft) 3PH/16A 380-415V Power Cord	9043	MRX	6653
4.3m (14-Ft) 1PH/30A (24A derated) Power Cord	9043	MRX	6654
4.3m (14-Ft) 1PH/30A (24A derated) WR Power Cord	9043	MRX	6655
4.3m (14-Ft) 1PH/32A Power Cord	9043	MRX	6656
4.3m (14-Ft) 1PH/32A Power Cord-Australia	9043	MRX	6657

4.3m (14-Ft) 1PH/30A (24A derated) Power Cord-Korea	9043	MRX	6658
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)	9043	MRX	6659
Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/15A)	9043	MRX	6660
Power Cord 2.8m (9.2-ft), Drawer to IBM PDU, (250V/10A)	9043	MRX	6665
4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia	9043	MRX	6667
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9043	MRX	6669
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9043	MRX	6671
Power Cord 2M (6.5-foot), Drawer to IBM PDU, 250V/10A	9043	MRX	6672
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/10A)	9043	MRX	6680
OEM (Generic) Indicator	9043	MRX	7770
OEM (GROUPE BULL) Indicator	9043	MRX	7773
OEM (Hitachi) Indicator	9043	MRX	7775
Indicator for Inspur Power servers	9043	MRX	777A
Ethernet Cable, 15m, Hardware Management Console to System Unit	9043	MRX	7802
Order Routing Indicator- System Plant	9043	MRX	9169
Language Group Specify - US English	9043	MRX	9300
New AIX License Core Counter	9043	MRX	9440
New Red Hat License Core Counter	9043	MRX	9442
New SUSE License Core Counter	9043	MRX	9443
Other AIX License Core Counter	9043	MRX	9444
Other Linux License Core Counter	9043	MRX	9445
3rd Party Linux License Core Counter	9043	MRX	9446
VIOS Core Counter	9043	MRX	9447
Other License Core Counter	9043	MRX	9449
Ubuntu Linux License Core Counter	9043	MRX	9450
Month Indicator	9043	MRX	9461
Day Indicator	9043	MRX	9462
Hour Indicator	9043	MRX	9463
Minute Indicator	9043	MRX	9464
Qty Indicator	9043	MRX	9465
Countable Member Indicator	9043	MRX	9466
Language Group Specify - Dutch	9043	MRX	9700
Language Group Specify - French	9043	MRX	9703
Language Group Specify - German	9043	MRX	9704
Language Group Specify - Polish	9043	MRX	9705
Language Group Specify - Norwegian	9043	MRX	9706
Language Group Specify - Portuguese	9043	MRX	9707
Language Group Specify - Spanish	9043	MRX	9708
Language Group Specify - Italian	9043	MRX	9711
Language Group Specify - Canadian French	9043	MRX	9712
Language Group Specify - Japanese	9043	MRX	9714
Language Group Specify - Traditional Chinese (Taiwan)	9043	MRX	9715
Language Group Specify - Korean	9043	MRX	9716
Language Group Specify - Turkish	9043	MRX	9718
Language Group Specify - Hungarian	9043	MRX	9719

Language Group Specify - Slovakian	9043	MRX	9720
Language Group Specify - Russian	9043	MRX	9721
Language Group Specify - Simplified Chinese (PRC)	9043	MRX	9722
Language Group Specify - Czech	9043	MRX	9724
Language Group Specify - Romanian	9043	MRX	9725
Language Group Specify - Croatian	9043	MRX	9726
Language Group Specify - Slovenian	9043	MRX	9727
Language Group Specify - Brazilian Portuguese	9043	MRX	9728
Language Group Specify - Thai	9043	MRX	9729
Customer Install MES	9043	MRX	9742
Notify CSO After Install	9043	MRX	9743
Product Renovated by IBM Indicator	9043	MRX	9993
10m (30.3-ft) - IBM MTP 12 strand cable for 40/100G transceivers	9043	MRX	EB2J
30m (90.3-ft) - IBM MTP 12 strand cable for 40/100G transceivers	9043	MRX	EB2K
Lift Tool	9043	MRX	EB2Z
Power Supply - 2300W for Server (200-240 VAC)	9043	MRX	EB39
Lift tool based on GenieLift GL-8 (standard)	9043	MRX	EB3Z
10GbE Optical Transceiver SFP+ SR	9043	MRX	EB46
25GbE Optical Transceiver SFP28	9043	MRX	EB47
1GbE Base-T Transceiver RJ45	9043	MRX	EB48
QSFP28 to SFP28 Connector	9043	MRX	EB49
0.5m SFP28/25GbE copper Cable	9043	MRX	EB4J
1.0m SFP28/25GbE copper Cable	9043	MRX	EB4K
2.0m SFP28/25GbE copper Cable	9043	MRX	EB4M
2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE	9043	MRX	EB4P
Service wedge shelf tool kit for EB3Z	9043	MRX	EB4Z
QSFP+ 40GbE Base-SR4 Transceiver	9043	MRX	EB57
100GbE Optical Transceiver QSFP28	9043	MRX	EB59
1.0M 100GbE Copper Cable QSFP28	9043	MRX	EB5K
1.5M 100GbE Copper Cable QSFP28	9043	MRX	EB5L
2.0M 100GbE Copper Cable QSFP28	9043	MRX	EB5M
3M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5R
5M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5S
10M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5T
15M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5U
20M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5V
30M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5W
50M 100GbE Optical Cable QSFP28 (AOC)	9043	MRX	EB5X
PCIe3 2-Port 10Gb NIC&ROCE SR/Cu Adapter	9043	MRX	EC2S
PCIe3 LP 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter	9043	MRX	EC2T
PCIe3 2-Port 25/10Gb NIC&ROCE SR/Cu Adapter	9043	MRX	EC2U
PCIe3 x8 1.6 TB NVMe Flash Adapter for AIX/Linux	9043	MRX	EC5B
PCIe3 x8 3.2 TB NVMe Flash Adapter for AIX/Linux	9043	MRX	EC5D
PCIe3 x8 6.4 TB NVMe Flash Adapter for AIX/Linux	9043	MRX	EC5F
Mainstream 800 GB SSD NVMe U.2 module	9043	MRX	EC5J
Mainstream 1.6 TB SSD NVMe U.2 module	9043	MRX	EC5K
Mainstream 3.2 TB SSD NVMe U.2 module	9043	MRX	EC5L
Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	EC5V
Mainstream 800 GB SSD PCIe3 NVMe U.2 module for AIX/Linux	9043	MRX	EC5X
PCIe4 2-port 100Gb ROCE EN adapter	9043	MRX	EC66
PCIe2 2-Port USB 3.0 Adapter	9043	MRX	EC6K

Description			
PCIe4 1.6TB NVMe Flash Adapter x8 for AIX/Linux	9043	MRX	EC7B
PCIe4 3.2TB NVMe Flash Adapter x8 for AIX/Linux	9043	MRX	EC7D
PCIe4 6.4TB NVMe Flash Adapter x8 for AIX/Linux	9043	MRX	EC7F
800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux	9043	MRX	EC7Q
800GB Mainstream NVMe U.2 SSD 4k for AIX/Linux	9043	MRX	EC7T
Carrier Conversion Kit for 7mm to 15mm NVMe Devices	9043	MRX	EC7X
1.5m (4.9-ft), Blue CAT5 Ethernet Cable	9043	MRX	ECB2
SAS X Cable 3m - HD Narrow 6Gb 2-Adapters to Enclosure	9043	MRX	ECBJ
SAS X Cable 6m - HD Narrow 6Gb 2-Adapters to Enclosure	9043	MRX	ECBK
SAS X Cable 15m - HD Narrow 3Gb 2-Adapters to Enclosure	9043	MRX	ECBM
SAS YO Cable 1.5m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBT
SAS YO Cable 3m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBU
SAS YO Cable 6m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBV
SAS YO Cable 10m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBW
SAS AE1 Cable 4m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBY
SAS YE1 Cable 3m - HD Narrow 6Gb Adapter to Enclosure	9043	MRX	ECBZ
3M Optical Cable Pair for PCIe3 Expansion Drawer	9043	MRX	ECC7
10M Optical Cable Pair for PCIe3 Expansion Drawer	9043	MRX	ECC8
System Port Converter Cable for UPS	9043	MRX	ECCF
3M Copper CXP Cable Pair for PCIe3 Expansion Drawer	9043	MRX	ECCS
3M Active Optical Cable Pair for PCIe3 Expansion Drawer	9043	MRX	ECCX
10M Active Optical Cable Pair for PCIe3 Expansion Drawer	9043	MRX	ECCY
3.0M SAS X12 Cable (Two Adapter to Enclosure)	9043	MRX	ECDJ
4.5M SAS X12 Active Optical Cable (Two Adapter to Enclosure)	9043	MRX	ECDK
10M SAS X12 Active Optical Cable (Two Adapter to Enclosure)	9043	MRX	ECDL
1.5M SAS YO12 Cable (Adapter to Enclosure)	9043	MRX	ECDT
3.0M SAS YO12 Cable (Adapter to Enclosure)	9043	MRX	ECDU
4.5M SAS YO12 Active Optical Cable (Adapter to Enclosure)	9043	MRX	ECDV
10M SAS YO12 Active Optical Cable (Adapter to Enclosure)	9043	MRX	ECDW
0.6M SAS AA12 Cable (Adapter to Adapter)	9043	MRX	ECE0
3.0M SAS AA12 Cable	9043	MRX	ECE3
4.5M SAS AA12 Active Optical Cable (Adapter to Adapter)	9043	MRX	ECE4
4.3m (14-Ft) PDU to Wall 3PH/24A 200-240V Delta-wired Power Cord	9043	MRX	ECJ5
4.3m (14-Ft) PDU to Wall 3PH/40A 200-240V Power Cord	9043	MRX	ECJ6
4.3m (14-Ft) PDU to Wall 3PH/48A 200-240V Delta-wired Power Cord	9043	MRX	ECJ7

Description			
High Function 9xC19 Single-Phase or Three-Phase Wye PDU plus	9043	MRX	ECJJ
High Function 9xC19 PDU plus 3-Phase Delta	9043	MRX	ECJL
High Function 12xC13 Single-Phase or Three-Phase Wye PDU plus	9043	MRX	ECJN
High Function 12xC13 PDU plus 3-Phase Delta	9043	MRX	ECJQ
Machine Kit of Parts (MKIT) Indicator	9043	MRX	ECSL
Custom Service Specify, Mexico	9043	MRX	ECSM
Custom Service Specify, Poughkeepsie, USA	9043	MRX	ECSP
Optical Wrap Plug	9043	MRX	ECW0
1x HW Subscription Increment	9043	MRX	EHB1
10x HW Subscription Increment	9043	MRX	EHB2
100x HW Subscription Increment	9043	MRX	EHB3
Solution Edition for Healthcare typical 2.95 to 3.9, 24-core processor module	9043	MRX	EHC8
Processor Activation for Healthcare Solution (#EHC8)	9043	MRX	EHCA
512GB Base Memory activation for MRX #EHC8	9043	MRX	EHCB
SAP HANA TRACKING FEATURE	9043	MRX	EHKV
Boot Drive / Load Source in EXP24SX Specify (in #ESLS or #ELLS)	9043	MRX	EHR2
SSD Placement Indicator - #ESLS/#ELLS	9043	MRX	EHS2
PCIe3 RAID SAS Adapter Quad-port 6Gb x8	9043	MRX	EJ0J
PCIe3 12GB Cache RAID SAS Adapter Quad-port 6Gb x8	9043	MRX	EJ0L
Storage NVME Backplane	9043	MRX	EJ0Q
PCIe3 12GB Cache RAID PLUS SAS Adapter Quad-port 6Gb x8	9043	MRX	EJ14
PCIe3 SAS Tape/DVD Adapter Quad-port 6Gb x8	9043	MRX	EJ1O
PCIe x16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	9043	MRX	EJ20
PCIe4 x16 to CXP Converter Adapter (support AOC)	9043	MRX	EJ2A
PCIe3 Crypto Coprocessor no BSC 4767	9043	MRX	EJ32
PCIe3 Crypto Coprocessor BSC-Gen3 4767	9043	MRX	EJ33
PCIe3 Crypto Coprocessor no BSC 4769	9043	MRX	EJ35
PCIe3 Crypto Coprocessor BSC-Gen3 4769	9043	MRX	EJ37
Non-paired Indicator EJ14 PCIe SAS RAID+ Adapter	9043	MRX	EJRL
Non-paired Indicator EJ0L PCIe SAS RAID Adapter	9043	MRX	EJRU
Specify Mode-1 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW1
Specify Mode-1 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW2
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW3
Specify Mode-2 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW4
Specify Mode-4 & (4)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW5
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW6

Description			
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (2)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJW7
Specify Mode-2 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWA
Specify Mode-2 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWB
Specify Mode-4 & (1)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWC
Specify Mode-4 & (2)EJ0J/EJ0M/EL3B/EL59 & (1)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWD
Specify Mode-4 & (3)EJ0J/EJ0M/EL3B/EL59 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWE
Specify Mode-1 & (2)EJ14 & (2)YO12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWF
Specify Mode-2 & (2)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWG
Specify Mode-2 & (2)EJ14 & (1)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWH
Specify Mode-2 & (4)EJ14 & (2)X12 for EXP24SX #ESLS/ELLS	9043	MRX	EJWJ
PowerVM for Linux indicator	9043	MRX	ELBV
1-core Linux Processor Activation for #EPEU	9043	MRX	ELBW
1-core Linux Processor Activation for #EPEV	9043	MRX	ELBX
1-core Linux Processor Activation for #EPGW	9043	MRX	ELBY
PDU Access Cord 0.38m	9043	MRX	ELC0
4.3m (14-Ft) PDU to Wall 24A 200-240V Power Cord North America	9043	MRX	ELC1
4.3m (14-Ft) PDU to Wall 3PH/24A 415V Power Cord North America	9043	MRX	ELC2
Power Cable - Drawer to IBM PDU (250V/10A)	9043	MRX	ELC5
64GB (2 x 32GB) DDR4 Memory DDIMM	9043	MRX	EM75
128GB (2 x 64GB) DDR4 Memory DDIMM	9043	MRX	EM76
256GB (2 x 128GB) DDR4 Memory DDIMM	9043	MRX	EM77
512GB (2 x 256GB) DDR4 Memory DDIMM	9043	MRX	EM7J
Active Memory Mirroring	9043	MRX	EM81
Power Active Memory Expansion	9043	MRX	EMBM
512 of #EMCP 1GB Memory Activations for MRX	9043	MRX	EMCE
512 of #EMCP 1GB Linux Memory Activations for MRX	9043	MRX	EMCG
1GB Memory Activations for MRX	9043	MRX	EMCP
100GB Memory Activations for MRX	9043	MRX	EMCQ
PCIe Gen3 I/O Expansion Drawer	9043	MRX	EMX0
AC Power Supply Conduit for PCIe3 Expansion Drawer	9043	MRX	EMXA
PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	9043	MRX	EMXF
PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	9043	MRX	EMXG
PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	9043	MRX	EMXH
1m (3.3-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9043	MRX	EN01
3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9043	MRX	EN02
5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9043	MRX	EN03
PCIe3 16Gb 2-port Fibre Channel Adapter	9043	MRX	EN0A

PCIe2 4-Port (10Gb+1GbE) SR+RJ45 Adapter	9043	MRX	EN0S
PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter	9043	MRX	EN0U
PCIe2 2-port 10/1GbE BaseT RJ45 Adapter	9043	MRX	EN0W
PCIe3 32Gb 2-port Fibre Channel Adapter	9043	MRX	EN1A
PCIe3 16Gb 4-port Fibre Channel Adapter	9043	MRX	EN1C
PCIe3 16Gb 4-port Fibre Channel Adapter	9043	MRX	EN1E
PCIe3 2-Port 16Gb Fibre Channel Adapter	9043	MRX	EN1G
PCIe4 32Gb 2-port Optical Fibre Channel Adapter	9043	MRX	EN1J
PCIe3 16Gb 2-port Fibre Channel Adapter	9043	MRX	EN2A
IBM eBMC Indicator node 9043-MRX for China	9043	MRX	ENSH
Power Enterprise Pools 2.0 Enablement	9043	MRX	EP20
Lab Services Private Cloud Capacity Assessment	9043	MRX	EP2X
Deactivation of LPM (Live Partition Mobility)	9043	MRX	EPA0
12-core Typical 3.35 to 4.0 GHZ (max) processor	9043	MRX	EPEU
18-core Typical 3.20 to 4.0 GHZ (max) processor	9043	MRX	EPEV
24-core Typical 2.95 to 3.90 GHZ (max) processor	9043	MRX	EPGW
Front Heatsink + TIM PAD (For MRX)	9043	MRX	EPLU
Rear Heatsink + TIM PAD (For MRX)	9043	MRX	EPLV
1 core Base Processor Activation (Pools 2.0) for EPEU	9043	MRX	EPRS
1 core Base Processor Activation (Pools 2.0) for EPEV	9043	MRX	EPRT
1 core Base Processor Activation (Pools 2.0) for EPGW	9043	MRX	EPRV
1 core Base Linux Processor Activation (Pools 2.0) for EPEU	9043	MRX	EPRW
1 core Base Linux Processor Activation (Pools 2.0) for EPEV	9043	MRX	EPRX
1 core Base Linux Processor Activation (Pools 2.0) for EPGW	9043	MRX	EPRZ
1 core Base Processor Activation (Pools 2.0) for #EPEU (From Static)	9043	MRX	EPSA
1 core Base Processor Activation (Pools 2.0) for #EPEV (From Static)	9043	MRX	EPSB
1 core Base Processor Activation (Pools 2.0) for #EPGW (From Static)	9043	MRX	EPSD
1 core Base Processor Activation (Pools 2.0) for #EPEU (From Static) Linux only	9043	MRX	EPSE
1 core Base Processor Activation (Pools 2.0) for #EPEV (From Static) Linux only	9043	MRX	EPSF
1 core Base Processor Activation (Pools 2.0) for #EPGW (From Static) Linux only	9043	MRX	EPSH
1GB Base Memory activation (Pools 2.0)	9043	MRX	EPSJ
100GB Base Memory activation (Pools 2.0)	9043	MRX	EPSP
512GB Base Memory Activation for Pools 2.0 (From Static)	9043	MRX	EPSQ
1GB Base Memory Activation for Pools 2.0 (From Static)	9043	MRX	EPSR
100GB Base Memory Activation for Pools 2.0 (From Static)	9043	MRX	EPSS
512GB Base Memory Activation for Pools 2.0 (From Linux)	9043	MRX	EPST
256GB Base Memory Activation for Pools 2.0 - Linux only	9043	MRX	EPSU

256GB Base Memory Activation for Pools 2.0	9043	MRX	EPSW
Horizontal PDU Mounting Hardware	9043	MRX	EPTH
High Function 9xC19 PDU: Switched, Monitoring	9043	MRX	EPTJ
High Function 9xC19 PDU 3-Phase: Switched, Monitoring	9043	MRX	EPTL
High Function 12xC13 PDU: Switched, Monitoring	9043	MRX	EPTN
High Function 12xC13 PDU 3-Phase: Switched, Monitoring	9043	MRX	EPTQ
1 core Processor Activation for #EPEU	9043	MRX	EPUR
1 core Processor Activation for #EPEV	9043	MRX	EPUS
PowerVM - Enterprise Edition	9043	MRX	EPVV
1 core Processor Activation for #EPGW	9043	MRX	EPYT
Record Purpose Only (RPO) Order indicator	9043	MRX	ERP0
1 core Base Processor Activation (Pools 2.0) for EPEU (from Prev)	9043	MRX	ERQ0
1 core Base Processor Activation (Pools 2.0) for EPEV (from Prev)	9043	MRX	ERQ1
1 core Base Processor Activation (Pools 2.0) for EPGW (from Prev)	9043	MRX	ERQ2
1 core Base Linux only Processor Activation (Pools 2.0) for EPEU (from Prev)	9043	MRX	ERQ4
1 core Base Linux only Processor Activation (Pools 2.0) for EPEV (from Prev)	9043	MRX	ERQ5
1 core Base Linux only Processor Activation (Pools 2.0) for EPGW (from Prev)	9043	MRX	ERQ6
256GB Base Memory Activation (Pools 2.0) (from Prev)	9043	MRX	ERQM
256GB Base Linux only Memory Activation (Pools 2.0) (from Prev)	9043	MRX	ERQN
Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	ES1E
Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	ES1G
Enterprise 1.6 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	ES3B
Enterprise 3.2 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	ES3D
Enterprise 6.4 TB SSD PCIe4 NVMe U.2 module for AIX/Linux	9043	MRX	ES3F
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ES94
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9043	MRX	ESB2
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9043	MRX	ESB6
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ESBA
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ESBG
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ESBL
S&H - No Charge	9043	MRX	ESC0
S&H	9043	MRX	ESC7
Virtual Capacity Expedited Shipment	9043	MRX	ESCT
iSCSI SAN Load Source Specify for AIX	9043	MRX	ESCZ
600GB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux	9043	MRX	ESEV
1.2TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux	9043	MRX	ESF3
1.8TB 10K RPM SAS SFF-2 HDD 4K for AIX/Linux	9043	MRX	ESFT
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9043	MRX	ESGV
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux	9043	MRX	ESGZ
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ESJ0
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux	9043	MRX	ESJ2

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3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESJ4
7.45TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESJ6
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESJJ
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESJL
3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESJN
7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESJQ
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux   9043    MRX    ESK1
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux   9043    MRX    ESK3
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESK8
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESKC
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESKG
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESKK
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESKP
3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESKT
7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESKX
Specify AC Power Supply for EXP24SX
Storage Enclosure                                  9043    MRX    ESLA
EXP24SX SAS Storage Enclosure                      9043    MRX    ESLS
931GB Mainstream SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESMB
1.86TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESMF
3.72TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESMK
7.44TB Mainstream SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESMV
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ESNA
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ESNE
300GB 15K RPM SAS SFF-2 4k Block Cached Disk
Drive (AIX/Linux)                                  9043    MRX    ESNM
600GB 15K RPM SAS SFF-2 4k Block Cached Disk
Drive (AIX/Linux)                                  9043    MRX    ESNR
AIX Update Access Key (UAK)                        9043    MRX    ESWK
387GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux   9043    MRX    ETK1
775GB Enterprise SAS 5xx SFF-2 SSD for AIX/Linux   9043    MRX    ETK3
387GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ETK8
775GB Enterprise SAS 4k SFF-2 SSD for AIX/Linux    9043    MRX    ETKC
1.55TB Enterprise SAS 4k SFF-2 SSD for AIX/Linux   9043    MRX    ETKG
Order Placed Indicator                             9043    MRX    EU29
Standalone USB DVD drive w/cable                   9043    MRX    EUA5
BP Post-Sale Services: 1 Day                       9043    MRX    SVBP
IBM Systems Lab Services Post-Sale Services: 1
Day                                                9043    MRX    SVCS
Other IBM Post-Sale Services: 1 Day                9043    MRX    SVNN
5000 Power to Cloud Reward points                  9043    MRX    SVPC
```

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

Planned Availability Date July 22, 2022

New Feature

Description	Machine type	Model number	Feature number
Rack Content Specify 9043-MRX 4EIA unit	7965	S42	ER3E

Feature conversions 🔗

Feature Conversions

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

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

The following conversions are available to clients:

Feature conversions for 9043-MRX adapter features:

From FC:	To FC:	Return parts
EJ20 - PCIe x 16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	EJ2A -PCIe4 x 16 to CXP Converter Adapter (support) AOC)	No
EJ35 - PCIe3 Crypto Coprocessor no BSC 4769	EJ37 - PCIe3 Crypto Coprocessor BSC-Gen3 4769	No

Feature conversions for 9043-MRX cable features:

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

Feature conversions for 9043-MRX global resource activation features:

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

Feature conversions for 9043-MRX memory features:

From FC:	To FC:	Return parts
EMCP - 1GB Memory Activations for MRX	EPSR - 1GB Base Memory Activation for Pools 2.0 (From Static)	No
EMCQ - 100GB Memory Activations for MRX	EPSS - 100GB Base Memory Activation for Pools 2.0 (From Static)	No
EMCE - 512 of #EMCP 1GB Memory Activations for MRX	EPSQ - 512GB Base Memory Activation for Pools 2.0 (From Static)	No
EMCG - 512 of #EMCP 1GB Linux Memory Activations for MRX	EPST - 512GB Base Memory Activation for Pools 2.0 (From Linux)	No

Feature conversions for 9043-MRX processor features:

From FC:	To FC:	Return parts
EPUR - 1 core Processor Activation for #EPEU	EPSA - 1 core Base Processor Activation (Pools	No

```
                           2.0) for #EPEU (From Static)
EPUS - 1 core Processor    EPSB - 1 core Base           No
Activation for #EPEV       Processor Activation (Pools
                           2.0) for #EPEV (From Static)
EPYT - 1 core Processor    EPSD - 1 core Base           No
Activation for #EPGW       Processor Activation (Pools
                           2.0) for #EPGW (From Static)
ELBW - 1 core Processor    EPSE - 1 core Base           No
Activation for #EPEU Linux Processor Activation (Pools
only                       2.0) for #EPEU (From
                           Static) Linux only
ELBX - 1 core Processor    EPSF - 1 core Base           No
Activation for #EPEV Linux Processor Activation (Pools
only                       2.0) for #EPEV (From
                           Static) Linux only
ELBY - 1 core Processor    EPSH - 1 core Base           No
Activation for #EPGW Linux Processor Activation (Pools
only                       2.0) for #EPGW (From
                           Static) Linux only
```

Feature conversions for 9043-MRX rack-related features:

```
                                                   Return
From FC:                   To FC:                  parts

EMXG - PCIe3 6-Slot Fanout EMXH - PCIe3 6-Slot Fanout  No
Module for PCIe3 Expansion Module for PCIe3 Expansion
Drawer                     Drawer
```

Publications 🔗

No publications are shipped with the announced product.

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

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

National language support 🔗

Not applicable

Services 🔗

IBM Systems Lab Services

Systems Lab Services offers infrastructure services to help build hybrid cloud and enterprise IT solutions. From servers to storage systems and software, Sy help deploy the building blocks of a next-generation IT infrastructure to empower a client's business. Systems Lab Services consultants can perform infrast clients online or onsite, offering deep technical expertise, valuable tools, and successful methodologies. Systems Lab Services is designed to help clients so gain new skills, and apply best practices.

Systems Lab Services offers a wide range of infrastructure services for IBM Power servers, IBM Storage systems, IBM Z®, and IBM LinuxONE. Systems Lab S presence and can deploy experienced consultants online or onsite around the world.

For assistance, contact Systems Lab Services at ibmsls@us.ibm.com.

To learn more, see the IBM Systems Lab Services website.

IBM Consulting

As transformation continues across every industry, businesses need a single partner to map their enterprise-wide business strategy and technology infrastr is the business partner to help accelerate change across an organization. IBM specialists can help businesses succeed through finding collaborative ways of connections across people, technologies, and partner ecosystems. IBM Consulting brings together the business expertise and an ecosystem of technologies the biggest problems faced by organizations. With methods that get results faster, an integrated approach that is grounded in an open and flexible hybrid cl incorporating technology from IBM Research™ and IBM Watson® AI, IBM Consulting enables businesses to lead change with confidence and deliver continu a business and its bottom line.

For additional information, see the IBM Consulting website.

IBM Technology Support Services (TSS)

Get preventive maintenance, onsite and remote support, and gain actionable insights into critical business applications and IT systems. Speed developer in for over 240 open-source packages. Leverage powerful IBM analytics and AI-enabled tools to enable client teams to manage IT problems before they becom

TSS offers extensive IT maintenance and support services that cover more than one niche of a client's environment. TSS covers products from IBM and OEM storage, network, appliances, and software, to help clients ensure high availability across their data center and hybrid cloud environment.

For details on available services, see the Technology support for hybrid cloud environments website.

IBM Expert Labs

Expert Labs can help clients accelerate their projects and optimize value by leveraging their deep technical skills and knowledge. With more than 20 years o these specialists know how to overcome the biggest challenges to deliver business results that can have an immediate impact.

Expert Labs' deep alignment with IBM product development allows for a strategic advantage as they are often the first in line to get access to new products, visibility into roadmaps. This connection with the development enables them to deliver First of a Kind implementations to address unique needs or expand flexible approach that works best for their organization.

For additional information, see the IBM Expert Labs website.

IBM Security Expert Labs

With extensive consultative expertise on IBM Security software solutions, Security Expert Labs helps clients and partners modernize the security of their ap workforce. With an extensive portfolio of consulting and learning services, Expert Labs provides project-based and premier support service subscriptions.

These services can help clients deploy and integrate IBM Security software, extend their team resources, and help guide and accelerate successful hybrid c critical strategies such as zero trust. Remote and on-premises software deployment assistance is available for IBM Cloud Pak® for Security, IBM Security QR Security SOAR/Resilient®, IBM i2®, IBM Security Verify, IBM Security Guardium®, and IBM Security MaaS360®.

For more information, contact Security Expert Labs at sel@us.ibm.com.

For additional information, see the IBM Security Expert Labs website.

IBM support 🔗

For installation and technical support information, see the IBM Support Portal.

Additional support 🔗

IBM Client Engineering for Systems

Client Engineering for Systems is a framework for accelerating digital transformation. It helps you generate innovative ideas and equips you with the practic expertise to turn those ideas into business value in weeks. When you work with Client Engineering for Systems, you bring pain points into focus. You empow manageable risks, adopt leading technologies, speed up solution development, and measure the value of everything you do. Client Engineering for Systems services to address a broad array of use cases, including capabilities for business transformation, hybrid cloud, analytics and AI, infrastructure systems, sec Client Engineering at sysgarage@ibm.com.

Technical information 🔗

Specified operating environment 🔗

Physical specifications
Power E1050 (9043-MRX)

System node

– Width: 448 mm (17.6 in.)

– Depth: 902 mm (35.5 in.)

– Height: 175 mm (6.9 in.), 4 EIA units

– Weight: 69 kg (153 lb)

Note:

– The EMX0 remote I/O drawer connection with optical or copper cable in S42 rack does not require rack extension.

– The EMX0 remote I/O drawer connection with copper cable in the T42 racks will stop the rear door from closing, thus requiring the mandatory 8-inch rack

PCIe I/O expansion drawer

– Width: 448 mm (17.5 in.)

– Depth: 736.6 mm (29 in.)

– Height: 177.8 mm (7.0 in.), 4 EIA units

– Weight: 54.4 kg (120 lb)

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

Operating environment

– Temperature:

  ▪ 5°C--45°C (41°F--113°F) nonoperating

  ▪ 18°C--27°C (64.4°F--80.6°F) recommended operating

  ▪ 5°C--40°C (41°F--104°F) allowable operating

  ▪ Derate maximum allowable dry-bulb temperature 1°C (1.8°F) per 175 m (574 ft) above 900 m (2,953 ft) up to a maximum allowable elevation of 3050

– Relative humidity (noncondensing):

  ▪ 5%--85% RH nonoperating

  ▪ 8%--80% operating

– Maximum dew point:

  ▪ 27°C (80°F) nonoperating

  ▪ 24°C (75°F) operating

– Operating voltage: 200--240 V AC

  ▪ ASHRAE class: A3 (fourth edition)

  ▪ Operating frequency: 50--60 Hz +/- 3 Hz

  ▪ Maximum Power consumption: 4,950 watts (per system node)

  ▪ Power source loading: 5.1 kVA maximum (per system node)

  ▪ Thermal output: 16,889 Btu/hr maximum (per system node)

  ▪ Maximum altitude: 3,050 m (10,000 ft)

    ▪ **Note:**

    ▪ To calculate the amperage, multiply the kVA by 1000 and divide that number by the operating voltage.

    ▪ Model 9043-MRX use four power supply units.

– Noise level: (Acoustics A-weighted Upper-Limit Sound Power Levels)

  ▪ One typically configured Four processors, 2 TB memory:

    ▪ 7.2 bels (operating/idle: 25 C, 500 m)

  ▪ One maximum configured Four processor, 2 TB memory:

    ▪ 8.2 bels (heavy workload, 25 C, 500 m)

  The Power E1050 server must be installed in a rack with a rear door and side panels for EMC compliance. The native HMC Ethernet ports must use shielde

Note: Government regulations, such as those prescribed by OSHA or European Community Directives, may govern noise level exposure in the workplace a and your server installation. This IBM system is available with an optional acoustical door feature that can help reduce the noise emitted from this system pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuratior designate the racks to be installed; the noise levels from other equipment; the room ambient temperature, and employees' location in relation to the equi compliance with such government regulations also depends upon a variety of additional factors, including the duration of employees' exposure and whetl hearing protection. IBM recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable i

EMC conformance classification

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

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

Homologation -- Telecom type approval

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

The IBM Power E1050 server nodes or system control unit or PCIe Expansion units are not certified for connection to interfaces of public telecommunicat Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions and for information can be used in the system and which are certified.

Product safety/country testing/certification

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

Systems

- Product category: D.
- Weighted Teraflops (WT) is based on the number of floating point operations the processor can perform in a cycle.
    - The WT for a Power E1050 0/12 core, typical 3.35--4.0 GHz, single-core processor is 0.0804 WT.
    - The WT for a Power E1050 0/18 core, typical 3.20--4.0 GHz, single-core processor is 0.0768 WT.
    - The WT for a Power E1050 0/24 core, typical 2.95--3.90 GHz, single-core processor is 0.0708 WT.

Notes:

- Multiply 0.0804 WT by the number of typical 3.35--4.0 GHz processor cores to find the system WT number, or multiply 0.0768 WT by the number of ty
- 4.0 GHz processor cores to find the system WT number, or multiply 0.0708 WT by the number of typical 2.95--3.90 GHz processor cores to find the sys
- The WT for 3.35 GHz 12-core system is 0.0804 x 12 = 0.97648 WT.
- The WT for 3.20 GHz 18-core system is 0.0768 x 18 = 1.3824 WT.
- The WT for 2.95 GHz 24-core system is 0.0708 x 24 = 1.6992 WT.

Hardware requirements
Not applicable

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

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

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

– AIX Version 7.3 with the 7300-00 Technology Level and service pack 7300-00-01-2148, or later
– AIX Version 7.2 with the 7200-05 Technology Level and service pack 7200-05-01-2038, or later

– AIX Version 7.2 with the 7200-04 Technology Level and Service Pack 7200-04-02-2016, or later

– AIX Version 7.1 with the 7100-05 Technology Level and Service Pack 7100-05-06-2016, or later

See the Power Systems Prerequisites website for compatibility information for hardware features and the corresponding AIX Technology Levels.

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

– Red Hat Enterprise Linux 8.4, for Power LE, or later

– Red Hat Enterprise Linux 9.0, for Power LE, or later

– SUSE Linux Enterprise Server 15 Service Pack 3, or later

– SUSE Linux Enterprise Server for SAP with SUSE Linux Enterprise Server 15 Service Pack 3, or later

– Red Hat Enterprise Linux for SAP with Red Hat Enterprise Linux 8.4 for Power LE, or later

– Red Hat OpenShift Container Platform 4.9, or later

Please review the Linux on IBM - Readme first issues page for any known Linux issues or limitations.

> ℹ **Note:** The above list applies to the installation of the Linux operating system LPAR in non-production SAP HANA implementations. Reference "IBM F (9040-MRX) for SAP HANA Production Use" Statement of Direction for production support.

If installing VIOS:

– VIOS 3.1.3.21, or later

Java™ is supported on Power10 servers. For best use of the performance capabilities and the most recent improvements of Power10 technology, IBM recon based applications to Java 7, Java 8, or later, whenever possible. For those clients who want to run Java in AIX environments, see the AIX Download and se website.

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

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

Planning information 🔗

Cable orders
None

Security, auditability, and control 🔗

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

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
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 opti
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 I 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 warran 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. Unle 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.

Any IBM Mainstream devices (previously called read intensive device) identified in this document have a maximum number of write cycles. IBM Mainstream replaced during standard warranty and maintenance period for devices that have not reached the maximum number of write cycles. Devices that reach this 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 co

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 telephone, or electronically through an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem de resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM det 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 considered Client 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. 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 fro 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 i

The following parts have been designated as Tier 1 CRUs:

– Front Bezel
– Op Panel - Base
– Op Panel - LCD
– Fans
– NVMe Drives
– IO Cassette
– PCIe Adapter
– Power Supply
– Service Cover
– TOD Battery

- Processor VRM
- IO VRM
- TPM Card

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, whethe 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 replace not receive the defective CRU within 15 days of your receipt of the replacement.

The following parts have been designated as Tier 2 CRUs:

- Processor module

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 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 response.

Non-IBM parts service

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 service machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their clients, and normal warranty service p 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 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 c

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 wa 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 wa 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-tin 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 capab reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifie determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundar 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 v disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

- IBM On-Site Repair, Same-Day On-Site Response Target, Monday-Sunday 00:00-24:00, 365 days a year

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 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 telephone or electronically, through an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem de resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM det is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are res and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IB 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.

– IBM On-Site Repair, Next Business Day Response Target, Monday-Friday. Calls must be received by 3:00 PM local time in order to qualify for next busines
– IBM On-Site Repair, Same Day On-Site Response Target, Monday-Sunday 00:00-24:00, 365 days a year. [1]

[1] recommended for this product

IBM Hardware Maintenance Services -- committed maintenance [2]

Organizations can lose as much as USD $100 million per year to downtime related to information and communications technology. IBM Hardware Maintena committed maintenance can deliver different types of hardware service for IBM equipment from the moment you call for support worldwide (based on the c has a presence) and around the clock. Through clear response targets and standardized service-delivery metrics, we can help you optimize your IT infrastru reduce the threat of hardware-related outages.

For more information, see the IBM Hardware Maintenance Services - committed maintenance Data Sheet (D) - USEN.

[2] Currently not available in the US.

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 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 ser geography, IBM will ship the replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and ar 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 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 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, y 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:

– Front Bezel
– Op Panel - Base
– Op Panel - LCD
– Fans
– NVMe Drives
– IO Cassette
– PCIe Adapter
– Power Supply
– Service Cover
– TOD Battery
– Processor VRM
– IO VRM

– TPM Card

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 up
services.

This service includes hardware problem determination (PD) on the non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installe
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 l
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
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
Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply
No

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 Licens
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 cust
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Product charges ⌗

The following are newly announced features on the specific models of the IBM Power 9043 machine type:

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

IBM Power System E1050
                  MRX                                        Yes
```

One CSC Billing Unit MRX 0010 Both Yes No Ten CSC Billing Units MRX 0011 Both Yes No

```
AIX Partition Specify
                  MRX     0265                      Both     Yes No
Linux Partition Specify
                  MRX     0266                      Both     Yes No
UPS Factory Integration Spcfy
                  MRX     0373                      MES      Yes No
HMC Factory Integration Spcfy
                  MRX     0374                      MES      Yes No
Display Factory Int. Specify
                  MRX     0375                      MES      Yes No
Rack Space for UPS
                  MRX     0376                      MES      Yes No
Reserve Rack for HMC
                  MRX     0377                      MES      Yes No
Reserve Rack Space for Display
                  MRX     0378                      MES      Yes No
Customer Specified Placement
                  MRX     0456                      Initial  N/A No
Load Source Not in CEC
                  MRX     0719                      Both     Yes No
SAN Load Source Specify
                  MRX     0837                      Both     Yes No


Custom Serv. Specify, Roch
```

MRX	1140	Both	Yes	No
300GB 15k RPM SAS SFF-2 Disk				
MRX	1953	Support	Yes	No
600GB SFF-2 HDD AIX/Linux				
MRX	1964	Support	Yes	No
Primary OS AIX				
MRX	2146	Both	Yes	No
Primary OS Linux				
MRX	2147	Both	Yes	No
Power Cord To PDU/UPS				
MRX	4558	Both	Yes	No
Rack Integration Services				
MRX	4649	Initial	N/A	No
No Factory Integration Ind.				
MRX	4650	Initial	N/A	No
Rack Indicator, Rack 1				
MRX	4651	Initial	N/A	No
Rack Indicator, Rack 2				
MRX	4652	Initial	N/A	No
Rack Indicator, Rack 3				
MRX	4653	Initial	N/A	No
Rack Indicator, Rack 4				
MRX	4654	Initial	N/A	No
Rack Indicator, Rack 5				
MRX	4655	Initial	N/A	No
Rack Indicator, Rack 6				
MRX	4656	Initial	N/A	No
Rack Indicator, Rack 7				
MRX	4657	Initial	N/A	No
Rack Indicator, Rack 8				
MRX	4658	Initial	N/A	No
Rack Indicator, Rack 9				
MRX	4659	Initial	N/A	No
Rack Indicator, Rack 10				
MRX	4660	Initial	N/A	No
Rack Indicator, Rack 11				
MRX	4661	Initial	N/A	No
Rack Indicator, Rack 12				
MRX	4662	Initial	N/A	No
Rack Indicator, Rack 13				
MRX	4663	Initial	N/A	No
Rack Indicator, Rack 14				
MRX	4664	Initial	N/A	No
Rack Indicator, Rack 15				
MRX	4665	Initial	N/A	No
Rack Indicator, Rack 16				
MRX	4666	Initial	N/A	No
Software Preload Required				
MRX	5000	Initial	N/A	No
PCIe2 4-port 1GbE Adapter				
MRX	5899	Support	Yes	No
Pwr Crd 4.3m 14ft to IBM PDU				
MRX	6458	Both	Yes	No
Pwr Crd (14FT), Drwr - OEM PDU				
MRX	6460	Both	Yes	No
Pwr Crd 4.3m 14ft Wall OEM PDU				

	MRX	6469	Both	Yes	No
Pwr Crd 1.8m 6ft Wall 125V/15A					
	MRX	6470	Support	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6471	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6472	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6473	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6474	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6475	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6476	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6477	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6478	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6488	Both	Yes	No
4.3m 14 Ft 3PH/32A Pwr Cord					
	MRX	6489	Both	Yes	No
4.3m (14 Ft) 1PH/63A Pwr Cord					
	MRX	6491	Both	Yes	No
4.3m (14 Ft) 1PH/60A PwrCord					
	MRX	6492	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6493	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	MRX	6494	Both	Yes	No
Pwr Crd 2.7m 9ft Wall 250V,10A					
	MRX	6496	Both	Yes	No
Power Cable Drawer to IBM PD					
	MRX	6577	Initial	Yes	No
Pwr Crd 2.7m 9ft Wall 125V,15A					
	MRX	6651	Both	Yes	No
4.3m 3PH/16A Power Cord					
	MRX	6653	Both	Yes	No
4.3m 1PH/30A (24A derated)					
	MRX	6654	Both	Yes	No
4.3m (14-Ft) 1PH/30A PwrCord					
	MRX	6655	Both	Yes	No
4.3m 14Ft 1PH/32A Power Cord					
	MRX	6656	Both	Yes	No
4.3m 14Ft 1PH/32A PwrCord					
	MRX	6657	Both	Yes	No
4.3m (14-Ft) 1PH/30A Korea					
	MRX	6658	Both	Yes	No
Pwr.Cord(9ft),To Wall/OEM PDU					
	MRX	6659	Both	Yes	No
Pwr Crd 14ft 4.3m WallOEM PDU					
	MRX	6660	Both	Yes	No
Pwr Crd 2.8m 9.2ft PDU					
	MRX	6665	Both	Yes	No
4.3m 14Ft 3PH/32A Pwr Cd Aus					

Description	Type	Number	Mode		
	MRX	6667	Both	Yes	No
Pwr Crd 4.3M, Drwr - OEM PDU	MRX	6669	Both	Yes	No
Pwr Crd 2.7m, Drwr - IBM PDU	MRX	6671	Both	Yes	No
Pwr Crd 2M, Drwr - IBM PDU	MRX	6672	Both	Yes	No
Pwr Crd 2.7m 9ft Wall OEM PDU	MRX	6680	Both	Yes	No
Eth Cbl 15M HW Management	MRX	7802	Support	Yes	No
Order Routing Indicator Syste	MRX	9169	Initial	N/A	No
Language Group Spcf-US Eng	MRX	9300	Initial	N/A	No
New AIX License Core Counter	MRX	9440	Initial	N/A	No
New Red Hat Lic Core Counter	MRX	9442	Initial	N/A	No
New SUSE Lic Core Counter	MRX	9443	Initial	N/A	No
Other AIX Lic Core Counter	MRX	9444	Initial	N/A	No
Other Linux Lic Core Counter	MRX	9445	Initial	N/A	No
3rd Party Linux Lic Core Cnt	MRX	9446	Initial	N/A	No
VIOS Core Counter	MRX	9447	Initial	N/A	No
Other License Core Counter	MRX	9449	Initial	N/A	No
Ubuntu Linux License Core Cntr	MRX	9450	Initial	N/A	No
Month Indicator	MRX	9461	Initial	N/A	No
Day Indicator	MRX	9462	Initial	N/A	No
Hour Indicator	MRX	9463	Initial	N/A	No
Minute Indicator	MRX	9464	Initial	N/A	No
Qty Indicator	MRX	9465	Initial	N/A	No
Countable Member Indicator	MRX	9466	Initial	N/A	No
Language Group Spcf-Dutch	MRX	9700	Initial	N/A	No
Language Group Spcf-French	MRX	9703	Initial	N/A	No
Language Group Spcf-German	MRX	9704	Initial	N/A	No
Language Group Spcf-Polish	MRX	9705	Initial	N/A	No
Lang Group Specify - Norwegian	MRX	9706	Initial	N/A	No
Lang.Group Spcf-Portuguese					

Description		Code	Status		
Language Group Spcf-Spanish	MRX	9707	Initial	N/A	No
Language Group Spcf-Italian	MRX	9708	Initial	N/A	No
Langua Gr Speci Canadian Frenc	MRX	9711	Initial	N/A	No
Language Group Spcf-Japanese	MRX	9712	Initial	N/A	No
Language Group Specify Tr Chin	MRX	9714	Initial	N/A	No
Language Group Spcf-Korean	MRX	9715	Initial	N/A	No
Language Group Spcf-Turkish	MRX	9716	Initial	N/A	No
Language Group Spcf-Hungarian	MRX	9718	Initial	N/A	No
Language Group Spcf-Slovakian	MRX	9719	Initial	N/A	No
Language Group Spcf-Russian	MRX	9720	Initial	N/A	No
Lang Group Spcf Simpl Chinese	MRX	9721	Initial	N/A	No
Language Group Spcf-Czech	MRX	9722	Initial	N/A	No
Language Group Spcf-Romanian	MRX	9724	Initial	N/A	No
Lang Group Specify - Croatian	MRX	9725	Initial	N/A	No
Language Group Spcf-Slovenian	MRX	9726	Initial	N/A	No
Lang Group Specify - Braz Port	MRX	9727	Initial	N/A	No
Lang Group Specify - Thai	MRX	9728	Initial	N/A	No
10m QSFP+ MTP Optical Cable	MRX	9729	Initial	N/A	No
30m QSFP+ MTP Optical Cable	MRX	EB2J	Both	Yes	No
Lift Tool	MRX	EB2K	Both	Yes	No
Pwr Sup 2300W 200-240 VAC	MRX	EB2Z	Both	Yes	No
Lift tool GenieLift GL-8	MRX	EB39	Both	Yes	No
10GbE Optical Transc SFP+ SR	MRX	EB3Z	Both	Yes	No
25GbE Opt Transceiver SFP28	MRX	EB46	Both	Yes	No
1GbE Base-T Transceiver RJ45	MRX	EB47	Both	Yes	No
QSFP28 to SFP28 Connector	MRX	EB48	Both	Yes	No
0.5 SFP/25GbE CU Cable	MRX	EB49	Both	Yes	No
1.0 SFP/25GbE CU Cable	MRX	EB4J	Both	Yes	No

Description	Type	FC	Support		
2.0 SFP/25GbE CU Cable	MRX	EB4K	Both	Yes	No
2.5 QSFP28/100GbE CU Cable	MRX	EB4M	Both	Yes	No
Service wedge shelf for EB3Z	MRX	EB4P	Both	Yes	No
QSFP+ 40GbE Transceiver	MRX	EB4Z	Both	No	No
100GbE Optic Transc QSFP28	MRX	EB57	Both	Yes	No
1.0M 100GbE Cu Cable QSFP28	MRX	EB59	Both	Yes	No
1.5M 100GbE Cu Cable QSFP28	MRX	EB5K	Both	Yes	No
2.0M 100GbE Cu Cable QSFP28	MRX	EB5L	Both	Yes	No
3M 100GbE Optic Cable QSFP28	MRX	EB5M	Both	Yes	No
5M 100GbE Optic Cable QSFP28	MRX	EB5R	Both	Yes	No
10M 100GbE Optic Cable QSFP28	MRX	EB5S	Both	Yes	No
15M 100GbE Optic Cable QSFP28	MRX	EB5T	Both	Yes	No
20M 100GbE Optic Cable QSFP28	MRX	EB5U	Both	Yes	No
30M 100GbE Optic Cable QSFP28	MRX	EB5V	Both	Yes	No
50M 100GbE Optic Cable QSFP28	MRX	EB5W	Both	Yes	No
PCIe3 2-Port 10Gb NIC&ROCE	MRX	EB5X	Both	Yes	No
PCIe3 LP 2-port 25/10GbE NIC	MRX	EC2S	Support	Yes	No
PCIe3 2-Port 25/10Gb NIC&Ro	MRX	EC2T	Support	Yes	No
PCIe3 x8 1.6 TB NVMe AIX/Lin	MRX	EC2U	Both	Yes	No
PCIe3 x8 3.2 TB NVMe AIX/Lin	MRX	EC5B	Support	Yes	No
PCIe3 x8 6.4 TB NVMe AIX/Lin	MRX	EC5D	Support	Yes	No
Mainstream 800GB SSD NVMe	MRX	EC5F	Support	Yes	No
Mainstream 1.6TB SSD NVMe	MRX	EC5J	Support	Yes	No
Mainstream 3.2TB SSD NVMe	MRX	EC5K	Support	Yes	No
Enterprise 6.4TB NVMe U.2	MRX	EC5L	Support	Yes	No
Mainstream 800GB SSD NVMe	MRX	EC5V	Both	Yes	No
PCIe4 2-port 100Gb ROCE EN	MRX	EC5X	Both	Yes	No
PCIe2 2-Port USB 3.0 Adapter	MRX	EC66	Both	Yes	No

	MRX	EC6K		Both	Yes No
PCIe4 1.6TB NVMe Flash Adapt					
	MRX	EC7B		Both	Yes No
PCIe4 3.2TB NVMe Flash Adapt					
	MRX	EC7D		Both	Yes No
PCIe4 6.4TB NVMe Flash Adapt					
	MRX	EC7F		Both	Yes No
800GB Mainstream NVMe U.2					
	MRX	EC7Q		Support	Yes No
800GB Mainstream NVMe U.2					
	MRX	EC7T		Both	Yes No
Carrier Conversion Kit NVMe					
	MRX	EC7X		Both	Yes No
1.5m Blue CAT5 Ethernet Cable					
	MRX	ECB2		Both	Yes No
SAS X Cable 3m - HD Narrow					
	MRX	ECBJ		Both	Yes No
SAS X Cable 6m - HD Narrow					
	MRX	ECBK		Both	Yes No
SAS X Cable 15m -HD Narrow 3Gb					
	MRX	ECBM		Support	Yes No
SAS YO Cable 1.5m - HD Narrow					
	MRX	ECBT		Both	Yes No
SAS YO Cable 3m - HD Narrow					
	MRX	ECBU		Both	Yes No
SAS YO Cable 6m - HD Narrow					
	MRX	ECBV		Both	Yes No
SAS YO Cable 10m - HD Narrow					
	MRX	ECBW		Both	Yes No
SAS AE1 Cable 4m - HD Narrow					
	MRX	ECBY		Both	Yes No
SAS YE1 Cable 3m - HD Narrow					
	MRX	ECBZ		Both	Yes No
3M Optical Cable Pair					
	MRX	ECC7		RPO Only	Yes No
10M Optical Cable Pair					
	MRX	ECC8		RPO Only	Yes No
Port Converter Cable for UPS					
	MRX	ECCF		Both	Yes No
3M Copper CXP Cable Pair					
	MRX	ECCS		Both	Yes No
3M Active Optical Cable Pair					
	MRX	ECCX		Both	Yes No
10M Active Optical Cbl Pair					
	MRX	ECCY		Both	Yes No
3.0M SAS X12 Cable					
	MRX	ECDJ		Both	Yes No
4.5M SAS X12 Cable					
	MRX	ECDK		Both	Yes No
10M SAS X12 Cable					
	MRX	ECDL		Both	Yes No
1.5M SAS YO12 Cable					
	MRX	ECDT		Both	Yes No
3.0M SAS YO12 Cable					
	MRX	ECDU		Both	Yes No
4.5M SAS YO12 Cable					

	MRX	ECDV		Both	Yes	No
10M SAS YO12 Cable						
	MRX	ECDW		Both	Yes	No
0.6M SAS AA12 Cable						
	MRX	ECE0		Both	Yes	No
3.0M SAS AA12 Cable						
	MRX	ECE3		Both	Yes	No
4.5M SAS AA12 Cable						
	MRX	ECE4		Both	Yes	No
4.3m (14-Ft) PDU to Wall Pwr						
	MRX	ECJ5		Both	Yes	No
4.3m (14-Ft) PDU to Wall Pwr						
	MRX	ECJ6		Both	Yes	No
4.3m (14-Ft) PDU to Wall Pwr						
	MRX	ECJ7		Both	Yes	No
High Function 9xC19 PDU plus						
	MRX	ECJJ		Both	Yes	No
High Function9xC19 PDU plus						
	MRX	ECJL		Both	Yes	No
High Function12xC13 PDU plus						
	MRX	ECJN		Both	Yes	No
High Function12xC13 PDU plus						
	MRX	ECJQ		Both	Yes	No
Custom Serv. Specify, Mexico						
	MRX	ECSM		Both	Yes	No
Custom Serv. Spec Poughkeepsie						
	MRX	ECSP		Both	Yes	No
Optical Wrap Plug						
	MRX	ECW0		Both	Yes	No
1x HW Subscription Increment						
	MRX	EHB1		MES	Yes	No
10x HW Subscription Incremen						
	MRX	EHB2		MES	Yes	No
100x HW Subscription Increme						
	MRX	EHB3		MES	Yes	No
24-core Sol Ed Healthcare						
	MRX	EHC8		Both	Yes	No
1-core Proc Act for EHC8						
	MRX	EHCA		Both	Yes	No
512GB Base Mem Act for EHC8						
	MRX	EHCB		Both	Yes	No
SAP HANA TRACKING FEAT						
	MRX	EHKV		Both	Yes	No
Boot / Load in EXP24SX Specify						
	MRX	EHR2		Both	N/A	No
SSD Placement Ind- #ESLS/#ELLS						
	MRX	EHS2		Both	Yes	No
PCIe3 RAID SAS Adapter 4-port						
	MRX	EJ0J		Both	Yes	No
PCIe3 12GB Cache RAID SAS Adap						

Type	Code	Description		Yes	No
MRX	EJ0L	Backplane 8-SAS Zero DASD	Support	Yes	No
MRX	EJ0Q	PCIe3 SAS Tape/DVD Adapter	Both	Yes	No
MRX	EJ10	PCIe3 12GB Cache RAID+ SAS Ada	Both	Yes	No
MRX	EJ14	PCIe X16 to CXP Adapter	Both	Yes	No
MRX	EJ20	PCIe4 x16 to CXP Adapter	RPO Only	Yes	No
MRX	EJ2A	PCIe3 Crypto Coproc noBSC 4767	Both	Yes	No
MRX	EJ32	PCIe3 Crypto Coproc BSC-3 4767	Support	Yes	No
MRX	EJ33	PCIe3 Crypto Coproc 4769	Support	Yes	No
MRX	EJ35	PCIe3 Crypto Coproc BSC4769	Both	Yes	No
MRX	EJ37	Non-paired Indicator EJ0L PCIe	Both	Yes	No
MRX	EJRL	Non-paired Indicator EJ0L PCIe	Both	Yes	No
MRX	EJRU	Specify Mode-1 for EXP24SX 1&1	MES	Yes	No
MRX	EJW1	Specify Mode-1 for EXP24SX 2&2	Both	Yes	No
MRX	EJW2	Specify Mode-2 for EXP24SX 2&2	Both	Yes	No
MRX	EJW3	Specify Mode-2 for EXP24SX 4&2	Both	Yes	No
MRX	EJW4	Specify Mode-4 for EXP24SX 4&2	Both	Yes	No
MRX	EJW5	Specify Mode-2 for EXP24SX 1&2	Both	Yes	No
MRX	EJW6	Specify Mode-2 for EXP24SX 2&2	Both	Yes	No
MRX	EJW7	Specify Mode-2 for EXP24SX 1&1	Both	Yes	No
MRX	EJWA	Specify Mode-2 for EXP24SX 2&1	Both	Yes	No
MRX	EJWB	Specify Mode-4 for EXP24SX 1&1	Both	Yes	No
MRX	EJWC	Specify Mode-4 for EXP24SX 2&1	Both	Yes	No
MRX	EJWD	Specify Mode-4 for EXP24SX 3&2	Both	Yes	No
MRX	EJWE	Specify Mode-1 for EXP24SX 2&2	Both	Yes	No
MRX	EJWF	Specify Mode-2 for EXP24SX 2&2	Both	Yes	No
MRX	EJWG	Specify Mode-2 for EXP24SX 2&1	Both	Yes	No
MRX	EJWH	Specify Mode-2 for EXP24SX 4&2	Both	Yes	No
MRX	EJWJ	PowerVM for Linux indicator	Both	Yes	No

MRX	ELBV		Both	Yes	No	1-core Linux Pro Ac for EPEU
MRX	ELBW		Both	Yes	No	1-core Linux Pro Ac for EPEV
MRX	ELBX		Both	Yes	No	1-core Linux Pro Ac for EPGW
MRX	ELBY		Both	Yes	No	PDU Access Cord 0.38m
MRX	ELC0		MES	Yes	No	PwrCrd 4.3m 14ft PDU to Wall
MRX	ELC1		Both	Yes	No	PwrCrd 4.3m 14ft PDU to Wall
MRX	ELC2		Both	Yes	No	Power Cord - Drawer to PDU
MRX	ELC5		Both	Yes	No	64GB DDR4 Memory
MRX	EM75		Both	Yes	No	128GB DDR4 Memory
MRX	EM76		Both	Yes	No	256GB DDR4 Memory
MRX	EM77		Both	Yes	No	512GB DDR4 Memory
MRX	EM7J		Both	Yes	No	Active Memory Mirroring
MRX	EM81		Both	Yes	No	Pwr Act Mem Expansion
MRX	EMBM		Initial	Yes	No	512GB Memory Activation
MRX	EMCE		Both	Yes	No	512GB Memory Act Linux
MRX	EMCG		Both	Yes	No	1GB Memory Activation
MRX	EMCP		Both	Yes	No	100GB Memory Activation
MRX	EMCQ		Both	Yes	No	PCIe Gen3 I/O Expansion Drawer
MRX	EMX0		Both	Yes	No	AC Power Supply Conduit
MRX	EMXA		Both	Yes	No	PCIe3 6-Slot Fanout Module
MRX	EMXF		RPO Only	Yes	No	PCIe3 6-Slot Fanout Module
MRX	EMXG		RPO Only	Yes	No	PCIe3 6-Slot Fanout Mod
MRX	EMXH		Both	Yes	No	1m 10GbE Cable SFP+ Act Twinax
MRX	EN01		Both	Yes	No	3m 10GbE Cable SFP+ Act Twinax
MRX	EN02		Both	Yes	No	5m 10GbE Cable SFP+ Act Twinax
MRX	EN03		Both	Yes	No	PCIe3 16Gb 2-port Fibre Channe
MRX	EN0A		Support	Yes	No	PCIe2 4-pt(10+1 GbE)SR+RJ45
MRX	EN0S		Support	Yes	No	PCIe2 4-pt(10+1GbE)CRSR+RJ45

Description		MRX	Code		Type	Yes	No
		MRX	EN0U		Support	Yes	No
PCIe2 2-pt 10/1GbE BaseT RJ45							
		MRX	EN0W		Both	Yes	No
PCIe3 32Gb 2-port FC Adapter							
		MRX	EN1A		Both	Yes	No
PCIe3 16Gb 4-port FC Adapter							
		MRX	EN1C		Both	Yes	No
PCIe3 16Gb 4-port FC Adapter							
		MRX	EN1E		Both	Yes	No
PCIe3 2-Port 16Gb FC Adapter							
		MRX	EN1G		Both	Yes	No
PCIe4 32Gb 2-port FC Adapter							
		MRX	EN1J		Both	Yes	No
PCIe3 16Gb 2-P Fibre Channel							
		MRX	EN2A		Both	Yes	No
IBM eBMC node for China							
		MRX	ENSH		Both	Yes	No
Power Ent Pools 2.0 Enable							
		MRX	EP20		Both	Yes	No
Lab Svcs Priv Cloud Cap Ass							
		MRX	EP2X		Both	Yes	No
Deactivation of LPM							
		MRX	EPA0		Both	Yes	No
12-core 3.35 GHZ processor							
		MRX	EPEU		Both	Yes	No
18-core 3.20 GHZ processor							
		MRX	EPEV		Both	Yes	No
24-core 3.90 GHZ processor							
		MRX	EPGW		Both	Yes	No
Front Heatsink for MRx							
		MRX	EPLU		Both	Yes	No
Rear Heatsink for MRx							
		MRX	EPLV		Both	Yes	No
1-w Base Pro Act #EPEU							
		MRX	EPRS		Both	Yes	No
1-w Base Pro Act #EPEV							
		MRX	EPRT		Both	Yes	No
1-w Base Pro Act #EPGW							
		MRX	EPRV		Both	Yes	No
1-w Base Lin Pro Act #EPEU							
		MRX	EPRW		Both	Yes	No
1-w Base Lin Pro Act #EPEV							
		MRX	EPRX		Both	Yes	No
1-w Base Lin Pro Act #EPGW							
		MRX	EPRZ		Both	Yes	No
1-w Base Pro Act #EPEU							
		MRX	EPSA		Both	Yes	No
1-w Base Pro Act #EPEV							
		MRX	EPSB		Both	Yes	No
1-w Base Pro Act #EPGW							
		MRX	EPSD		Both	Yes	No
1-w Base Lin Pro Act #EPEU							
		MRX	EPSE		Both	Yes	No
1-w Base Lin Pro Act #EPEV							

	MRX	EPSF		Both	Yes	No
1-w Base Lin Pro Act #EPGW						
	MRX	EPSH		Both	Yes	No
1GB Base Mem Activation						
	MRX	EPSJ		Both	Yes	No
100GB Base Mem Activation						
	MRX	EPSP		Both	Yes	No
512GB Base Mem Act from Stat						
	MRX	EPSQ		Both	Yes	No
1GB Base Mem Act from Stat						
	MRX	EPSR		Both	Yes	No
100GB Base Mem Act Stat						
	MRX	EPSS		Both	Yes	No
512GB Base Mem Act Stat Lin						
	MRX	EPST		Both	Yes	No
256GB Base Mem Act Linux						
	MRX	EPSU		Both	Yes	No
256GB Base Mem Activ						
	MRX	EPSW		Both	Yes	No
Horizontal PDU Mounting Hardwr						
	MRX	EPTH		Both	Yes	No
High Function 9xC19 PDU						
	MRX	EPTJ		Support	Yes	No
High Function 9xC19 PDU 3Phase						
	MRX	EPTL		Support	Yes	No
High Function 12xC13 PDU						
	MRX	EPTN		Support	Yes	No
High Function 12xC13 PDU 3-Phs						
	MRX	EPTQ		Support	Yes	No
1-core Proc Act for #EPEU						
	MRX	EPUR		Both	Yes	No
1-core Proc Act for #EPEV						
	MRX	EPUS		Both	Yes	No
PowerVM Enterprise Edition						
	MRX	EPVV		Both	Yes	No
1-core Proc Act for #EPGW						
	MRX	EPYT		Both	Yes	No
1w Base proc act #EPEU						
	MRX	ERQ0		Both	Yes	No
1w Base proc act #EPEV						
	MRX	ERQ1		Both	Yes	No
1w Base proc act #EPGW						
	MRX	ERQ2		Both	Yes	No
1w Base Lin proc act #EPEU						
	MRX	ERQ4		Both	Yes	No
1w Base Lin proc act #EPEV						
	MRX	ERQ5		Both	Yes	No
1w Base Lin proc act #EPGW						
	MRX	ERQ6		Both	Yes	No
256GB Base Mem Act pre						
	MRX	ERQM		Both	Yes	No
256GB Linux only Mem Act pre						
	MRX	ERQN		Both	Yes	No
Enterprise 1.6TB NVMe U.2						
	MRX	ES1E		Both	Yes	No
Enterprise 3.2TB NVMe U.2						

	MRX	ES1G		Both	Yes	No
Enterprise 1.6TB NVMe U.2						
	MRX	ES3B		Both	Yes	No
Enterprise 3.2TB NVMe U.2						
	MRX	ES3D		Both	Yes	No
Enterprise 6.4TB NVMe U.2						
	MRX	ES3F		Both	Yes	No
387GB Enterprise SAS 4k SFF2						
	MRX	ES94		Support	Yes	No
387GB Enterprise SAS 5xxSFF2						
	MRX	ESB2		Support	Yes	No
775GB Enterprise SAS 5xxSFF2						
	MRX	ESB6		Support	Yes	No
387GB Enterprise SAS 4k SFF2						
	MRX	ESBA		Support	Yes	No
775GB Enterprise SAS 4k SFF2						
	MRX	ESBG		Support	Yes	No
1.55TB Enterprise SAS 4kSFF2						
	MRX	ESBL		Support	Yes	No
S&H - No Charge						
	MRX	ESC0		Both	N/A	No
S&H						
	MRX	ESC7		Initial	N/A	No
Virtual Capacity Exped Shipm						
	MRX	ESCT		MES	N/A	No
iSCSI SAN Load Source AIX						
	MRX	ESCZ		Initial	N/A	No
600GB SFF-2 HDD AIX/Linux						
	MRX	ESEV		Both	Yes	No
1.2TB SFF-2 HDD AIX/Linux						
	MRX	ESF3		Both	Yes	No
1.8TB SFF-2 HDD AIX/Linux						
	MRX	ESFT		Both	Yes	No
387GB Enterprise SAS 5xxSFF2						
	MRX	ESGV		Support	Yes	No
775GB Enterprise SAS 5xxSFF2						
	MRX	ESGZ		Support	Yes	No
931GB Mainstream SAS 4k SFF2						
	MRX	ESJ0		Support	Yes	No
1.86TB Mainstream SAS 4kSFF2						
	MRX	ESJ2		Support	Yes	No
3.72TB Mainstream SAS 4kSFF2						
	MRX	ESJ4		Support	Yes	No
7.45TB Mainstream SAS 4kSFF2						
	MRX	ESJ6		Support	Yes	No
931GB Mainstream SAS 4k SFF2						
	MRX	ESJJ		Support	Yes	No
1.86TB Mainstream SAS 4kSFF2						
	MRX	ESJL		Support	Yes	No
3.72TB Mainstream SAS 4kSFF2						
	MRX	ESJN		Support	Yes	No
7.44TB Mainstream SAS 4kSFF2						
	MRX	ESJQ		Support	Yes	No
387GB Enterprise SAS 5xxSFF2						
	MRX	ESK1		Both	Yes	No
775GB Enterprise SAS 5xxSFF2						

	MRX	Code	Type		
	MRX	ESK3	Both	Yes	No
387GB Enterprise SAS 4k SFF2					
	MRX	ESK8	Both	Yes	No
775GB Enterprise SAS 4k SFF2					
	MRX	ESKC	Both	Yes	No
1.55TB Enterprise SAS 4kSFF2					
	MRX	ESKG	Both	Yes	No
931GB Mainstream SAS 4k SFF2					
	MRX	ESKK	Both	Yes	No
1.86TB Mainstream SAS 4kSFF2					
	MRX	ESKP	Both	Yes	No
3.72TB Mainstream SAS 4kSFF2					
	MRX	ESKT	Both	Yes	No
7.44TB Mainstream SAS 4kSFF2					
	MRX	ESKX	Both	Yes	No
Specify AC Power Supply					
	MRX	ESLA	Both	Yes	No
EXP24SX SAS Storage Enclosure					
	MRX	ESLS	Both	Yes	No
931GB Mainstream SAS 4k SFF2					
	MRX	ESMB	Both	Yes	No
1.86TB Mainstream SAS 4kSFF2					
	MRX	ESMF	Both	Yes	No
3.72TB Mainstream SAS 4kSFF2					
	MRX	ESMK	Both	Yes	No
7.44TB Mainstream SAS 4kSFF2					
	MRX	ESMV	Both	Yes	No
775GB Enterprise SAS 4k SFF2					
	MRX	ESNA	Support	Yes	No
1.55TB Enterprise SAS 4kSFF2					
	MRX	ESNE	Support	Yes	No
300GB 15K SAS SFF-2 4k HDD					
	MRX	ESNM	Both	Yes	No
600GB 15K SAS SFF-2 4k HDD					
	MRX	ESNR	Both	Yes	No
AIX Update Access Key					
	MRX	ESWK	Initial	N/A	No
387GB Enterprise SAS 5xxSFF2					
	MRX	ETK1	Both	Yes	No
775GB Enterprise SAS 5xxSFF2					
	MRX	ETK3	Both	Yes	No
387GB Enterprise SAS 4k SFF2					
	MRX	ETK8	Both	Yes	No
775GB Enterprise SAS 4k SFF2					
	MRX	ETKC	Both	Yes	No
1.55TB Enterprise SAS 4kSFF2					
	MRX	ETKG	Both	Yes	No
Order Placed Indicator					
	MRX	EU29	Both	Yes	No
Standalone USB DVD drive w/c					
	MRX	**EUA5**	Both	Yes	No
BP Post-Sales Service 1 Day					
	MRX	SVBP	Both	Yes	No
Post-Sales Service 1 Day					
	MRX	SVCS	Both	Yes	No
Other Post-Sale Svcs: 1 Day					

Description Machine type 7965	Model number	Feature number	Purchase price	Minimum Monthly Maint. charge	Initial/ MES/ Both/ support	RP CSU	MES
	MRX	SVNN			Both	Yes	No
5000 Cloud Reward Points							
	MRX	SVPC			Initial	N/A	No

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

Description Machine type 7965	Model number	Feature number	Purchase price	Minimum Monthly Maint. charge	Initial/ MES/ Both/ support	RP CSU	MES
Rack Cont.Spcf 9043 4U							
	S42	ER3E			Initial	Yes	No

RP MES = Return parts, miscellaneous equipment specifications

CSU = Customer setup

Feature Conversions

Feature conversions for 9043-MRX adapter features:

From FC:	To FC:	Parts returned	Purchase price
EJ20 - PCIe x 16 to CXP Optical or CU converter Adapter for PCIe3 Expansion Drawer	EJ2A -PCIe4 x 16 to CXP Converter Adapter (support) AOC)	No	
EJ35 - PCIe3 Crypto Coprocessor no BSC 4769	EJ37 - PCIe3 Crypto Coprocessor BSC-Gen3 4769	No	

Feature conversions for 9043-MRX cable features:

From FC:	To FC:	Parts returned	Purchase price
ECC7 - 3M Optical Cable Pair for PCIe3 Expansion Drawer	ECCX - 3M Active Optical Cable Pair for PCIe3 Expansion Drawer	No	
ECC8 - 10M Optical Cable Pair for PCIe3 Expansion Drawer	ECCY - 10M Active Optical Cable Pair for PCIe3 Expansion Drawer	No	

Feature conversions for 9043-MRX global resource activation features:

From FC:	To FC:	Parts returned	Purchase price
EP2X - Lab Services Private Cloud Capacity Assessment	EP20 - Power Enterprise Pools 2.0 Enablement	No	

Feature conversions for 9043-MRX memory features:

From FC:	To FC:	Parts returned	Purchase price
EMCP - 1GB Memory Activations for MRX	EPSR - 1GB Base Memory Activation for Pools 2.0 (From Static)	No	
EMCQ - 100GB Memory Activations for MRX	EPSS - 100GB Base Memory Activation for Pools 2.0 (From Static)	No	

		Parts returned	
EMCE - 512 of #EMCP 1GB Memory Activations for MRX	EPSQ - 512GB Base Memory Activation for Pools 2.0 (From Static)	No	
EMCG - 512 of #EMCP 1GB Linux Memory Activations for MRX	EPST - 512GB Base Memory Activation for Pools 2.0 (From Linux)	No	

Feature conversions for 9043-MRX processor features:

From FC:	To FC:	Parts returned	Purchase price
EPUR - 1 core Processor Activation for #EPEU	EPSA - 1 core Base Processor Activation (Pools 2.0) for #EPEU (From Static)	No	
EPUS - 1 core Processor Activation for #EPEV	EPSB - 1 core Base Processor Activation (Pools 2.0) for #EPEV (From Static)	No	
EPYT - 1 core Processor Activation for #EPGW	EPSD - 1 core Base Processor Activation (Pools 2.0) for #EPGW (From Static)	No	
ELBW - 1 core Processor Activation for #EPEU Linux only	EPSE - 1 core Base Processor Activation (Pools 2.0) for #EPEU (From Static) Linux only	No	
ELBX - 1 core Processor Activation for #EPEV Linux only	EPSF - 1 core Base Processor Activation (Pools 2.0) for #EPEV (From Static) Linux only	No	
ELBY - 1 core Processor Activation for #EPGW Linux only	EPSH - 1 core Base Processor Activation (Pools 2.0) for #EPGW (From Static) Linux only	No	

Feature conversions for 9043-MRX rack-related features:

From FC:	To FC:	Parts returned	Purchase price
EMXG - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	EMXH - PCIe3 6-Slot Fanout Module for PCIe3 Expansion Drawer	No	

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