IBM Power System AC922 (8335-GTG) server helps you to harness breakthrough accelerated AI, HPDA, and HPC performance for faster time to insight

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At a glance

The IBM(R) Power(R) System AC922 (8335-GTG) server is an AI, supercomputing, powerful 2-socket server that offers 32 or 40 fully activated cores and I/O configuration flexibility to help meet accelerated computing needs. The server features are designed for high-performance data analytics and high-performance computing workloads.

The new Power System AC922 model offers:

- Two IBM POWER9™ Single Chip Module (SCM) processors that offer high performance with 32 or 40 fully activated cores
- Up to 1 TB of memory
- Four PCIe slots and three CAPI enabled for future CAPI-enabled devices (a maximum of three CAPI devices can be used concurrently)
- Two 2.5-inch SATA drives for a maximum of 4 TB hard disk drive (HDD) or 7.68 TB of solid-state drive (SSD) storage
- Two integrated USB 3.0 ports
- Two hot-swap and redundant power supplies: 2200 W 200-240 and 277 V AC
- 19-inch rack-mount hardware (2U)

Overview

The Power System AC922 server is co-designed with OpenPOWER Foundation ecosystem members for the demanding needs of deep learning and AI, high-performance analytics, and high-performance computing users. It will be deployed in the most powerful supercomputers on the planet through a partnership between IBM, NVIDIA, and Mellanox, among others.

The Power AC922 server delivers four Tesla V100 with NVLink GPUs supported in two processor sockets, offering 32-core at 2.6 GHz (3.09 GHz turbo) or 40-core at 2.0 GHz (2.87 GHz turbo) POWER9 NVLink 2.0 technology configuration in a 19-inch rack-mount, 2U (EIA units) drawer configuration. All the cores are activated.

The Power AC922 server provides two hot-swap and redundant power supplies (for all GPU configurations) and sixteen DIMM memory slots. Supported memory features are 16 GB (#EM61), 32 GB (#EM63), and 64 GB (#EM64), allowing for a maximum system memory of over 1 TB.

The Power AC922 server also offers:

- High throughput and performance for high-value Linux$^{(R)}$ workloads such as LAMP, BDA, or industry applications
- Potentially low acquisition cost through system optimization (industry standard memory, limited configurations, limited I/O and expansion, and industry standard warranty)
- Multiple I/O options in the system unit, including:
  - Two PCIe x16 4.0 LP slots, CAPI enabled
  - One PCIe x8 4.0 LP slot, CAPI enabled or one PCIe x8x8 shared 4.0 slot, CAPI enabled
  - One PCIe x4 4.0 LP slot
- Two SFF bays for two HDDs or two SSDs
- Integrated SATA controller (does not support RAID functionality)
- Optional Mellanox InfiniBand or high-performance Ethernet
- One front and one rear USB 3.0 port
- 19-inch rack-mount 2U configuration
- Operating systems:
  - Red Hat Enterprise Linux 7.4 for Power LE (IBMPOWER9), or later

Key prerequisites

Red Hat Enterprise Linux 7.4 for Power LE (POWER9), or later

Planned availability date

December 22, 2017

Description

Summary of standard features for the Power System AC922 server:

- Power Systems^{TM} server built with POWER9 processor modules
  - 16-core, 2.6 GHz (3.09 GHz turbo)
  - 20-core, 2.0 GHz (2.87 GHz turbo)
- High-performance DDR4 memory
  - 256 GB (#EM61 x16), 512 GB (#EM63 x16), or 1.02 TB (#EM64 x16) memory features
- Storage bays
  - Two SFF 4-bays for two HDDs or two SSDs
  - Two 1 TB 7200 RPM SATA disk drives (#ELD0)
  - Two 2 TB 7200 RPM SATA disk drives (#ES6A)
  - Two 960 GB SATA SSD (#ELU4)
  - Two 1.92 TB SATA SSD (#ELU5)
  - Two 3.84 TB SATA SSD (#ELU6)
- PCIe Gen4 slots
  - Two PCIe x16 G4 LP slot, CAPI enabled
  - One PCIe x8 G4 LP slot, CAPI enabled
  - One PCIe x4 G4 LP slot
- Compute Intensive Accelerator

- Two or four 16 GB SXM2 NVIDIA Tesla V100 GPU with NVLINK Air-Cooled (#EC4J)
- Integrated:
  - One front USB 3.0 port and one rear USB 3.0 port
- Two hot-swap redundant power supplies (for all GPU configurations)
- 19-inch rack-mount hardware (2U)

Power AC922 (8335-GTG) system configuration

The minimum Power AC922 initial order must include: two processor modules, 256 GB of memory, two power supplies, two line cords, rack-mounting hardware, a system software indicator, a rack integrator specify, and a Language Group Specify.

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

Feature number	Description
EP0K x 2	16-core 2.6 GHz (3.09 GHz Turbo) POWER9 Processor Module
or	
EP0M x 2	20-core 2.0 GHz (2.87 GHz Turbo) POWER9 Processor Module
EM61 x 16	16 GB DIMMs, 2666 MHz, 4 Gb DDR4 DRAM
EC16 x 1	Open Power Abstraction Layer (OPAL)
EC4J x 2	NVIDIA Tesla V100 GPU with NVLINK Air-Cooled (16 GB)
4650 x 1	Rack Indicator -- Not Factory Integrated
EB2X x 2	AC Power Supply, 2200 Watt (200 - 240 V/277 V)
2 power cords	Select two power cords from supported list. Feature EPAM is defaulted. (#EPAM is Power Cord 4.3 m (14-ft), Drawer to Wall/ IBM PDU (250V/16A))
2147 x 1	Primary OS Linux
EJTY x 1	Rack-mount fixed rail kit
93xx x 1	Language Group Specify (select one from announced features)

Notes:

- If a rack is wanted, it must be ordered as an MTM rack on initial system orders. If on the same system order, it will be shipped at the same time in the same shipment, but in separate packing material. IBM does not offer IBM Manufacturing rack integration of the server into the rack before shipping at this time.
- The 8335-GTG server allows 0, 1, or 2 HDDs or SSDs. There is no mixing of HDD features and no mixing of SSD features.

Processor modules

A minimum of two identical processor modules are required with sixteen processor cores (#EP0K) or twenty processor cores (#EP0M) allowed. All processor cores are activated.

There are no processor activation features used or orderable on the 8335-GTG. All processor cores/"n-ways" are always fully activated.

Mixing of different processor features on the same system is not allowed.

System memory

There are 16 memory slots in the server. Each memory slot can hold one DDR4 memory feature. A minimum of 16 memory features is required, filling all the

memory slots. With 16 GB DIMMs, 256 GB of memory is required. With 32 GB DIMMs, 512 GB of memory is required. With 64 GB DIMMs, 1.02 TB is required.

Note: Mixing of memory features is not allowed.

DIMM memory features

Feature name	Feature number	Maximum quantity
16 GB DDR4 2666 MHz	EM61	16
32 GB DDR4 2666 MHz	EM63	16
64 GB DDR4 2666 MHz	EM64	16

I/O adapters

The system contains the following adapter slots:

- Two PCIe x16 G4 HHHL slot, CAPI enabled
- One PCIe x8 G4 HHHL slot, CAPI enabled or one PCIe x8x8 shared 4.0 slot, CAPI enabled
- One PCIe x4 G4 HHHL slot

Only LP adapters can be placed in LP slots. An x8 adapter can be placed in an x16 slot but an x16 adapter cannot be placed in an x8 slot.

Power supply

Two hot-swap and redundant power supplies (for all GPU configurations): 2200 W 200 - 240 V/ 277 V AC (2 x #EB2X)

Power cords

Two power cords are required. Two feature EPAM cords are defaulted. See the feature listing for other options.

Reliability, Availability, and Serviceability

The Power AC922 server brings POWER9 processor and memory RAS functionality into a cloud data center with Open Source Linux technology supplying the operating system and virtualization. The OPAL firmware provides a hypervisor and operating system-independent layer that exploits the error detection and self-healing functions built into the POWER9 processor.

The processor address-paths and data paths, the control logic, state machines, and computational units are protected with parity or error correction codes (ECC). The processor core soft errors or intermittent errors are recovered with processor instruction retry. Unrecoverable errors are reported as machine check (MC) while errors that affect the integrity of data lead to system check-stop.

The Level 1 (L1) data and instruction caches in each processor core are parity protected and data are stored through to L2 immediately. L1 caches have a retry capability for intermittent errors and a cache set delete mechanism for handling solid failures. The L2 and L3 caches in the POWER9 processor are protected with double-bit detect, single-bit correct ECC. In addition, a threshold of correctable errors detected on cache lines can result in the data in the cache lines being purged and the cache lines removed from further access without requiring a reboot. An uncorrectable error detected in these caches can also trigger a purge and delete of cache lines. This does not impact the current operation if the cache lines contained data unmodified from what was stored in system memory.

The memory subsystem has proactive memory scrubbing to help prevent the accumulation of multiple single-bit errors. The ECC scheme can correct the complete failure of any one memory module within an ECC word. After marking the module as unusable, the ECC logic can still correct single symbol (two adjacent bit) errors. An uncorrectable error of data of any layer of cache up to the main memory is marked to prevent usage of fault data. The processor's memory controller has retry capabilities for certain fetch and store faults.

Special Uncorrectable Error handling

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

Thermal management, current/voltage monitoring

The On Chip Controller (OCC) monitors various temperature sensors in the processor module, memory modules, and environmental temperature sensors and steers the throttling of processor cores and memory channels should the temperature rise over thresholds defined by the design. The power supplies have their own independent thermal sensors and monitoring.

Power supplies and voltage regulator modules monitor over-voltage, under-voltage, and over-current conditions. They report into a power good tree that is monitored by the Service Processor.

PCI extended error handling

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

Graphics processing unit (GPU) acceleration

GPUs are attached with second-generation NVLink to the system power processors and provide cache coherence capabilities. The GPUs should be run in "compute mode," which enables Single Error Correction and Double Error Detection (SECDEC) Error Correction Code (ECC) for the GPU Memory, SM register file, L1 cache, and L2 cache to improve data integrity for GPU-accelerated workloads.

Chassis policy after input power loss and auto-restart after system-check-stop

The boot parameter "chassis policy" controls whether the server returns to the previous state or powers up axiomatically after an input power loss. The system automatically reboots after a system-check-stop, and it is up to the system management software to decide whether to use the server with potentially fewer resources.

Serviceability

The server is designed for system install and setup, feature install and remove, proactive maintenance, and corrective repair performed by the client: Warranty Service Upgrades are offered for an On Site Repair (OSR) by an IBM System Services Representative (SSR) or an authorized warranty service provider.

IBM Knowledge Center provides up-to-date documentation to effectively service the system with:

• Quick Install Guide
• User's Guide
• Troubleshooting Guide
• Boot Configuration Guide

The documentation can be downloaded in PDF format or used online with an internet connection.

Service Processor

The Service Processor supports the Intelligent Platform Management Interface (IPMI 2.0) and Data Center Management Interface (DCMI 1.5) and Simple Network Management Protocol (SNMP V2 and V3) for system monitoring and management. The Service Processor provides platform system functions such as power on/off, power sequencing, power fault monitoring, power reporting, fan/thermal control, fault monitoring, VPD inventory collection, Serial over LAN (SOL), Service Indicator LED management, code update, and event reporting through system event logs (SEL).

All SELs can be retrieved either directly from the Service Processor or from the host operating system (Linux). The Service Processor monitors the operation of the firmware during the boot process and also monitors the hypervisor for termination. The firmware code update is supported through the Service Processor and IPMI interface. The firmware image can be updated or flashed regardless of its current state.

Service interface

The service interface enables the client and the support personnel to communicate with the service support applications in a server by connecting directly or remotely through a web browser or command-line interface. It provides access to various service applications and available actions. The service interface enables client and support personnel to manage system resources, inventory, and service information in an efficient and effective way.

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

- Service processor: Ethernet Service Network with IPMI version 2.0, systems management GUI through web browser
- Service indicator LEDs: System attention and system identification (front and back)
- Host operating system: Command-line interface

The primary service applications are:

- System event logs (SEL)
- Operating system event logs
- Sensor status GUI LEDs for Problem Determination (PD) when next to the system, locally

Concurrent maintenance

The following components can be replaced without powering off the server:

- Hard drives
- Fans

Error handling and reporting

In the event of a system hardware failure or environmentally induced failure, the system error capture capability systematically analyzes the hardware error signature to help determine the cause of failure. The processor and memory recoverable errors are handled through Processor Runtime Diagnostics (PRD) in the OPAL layer and generate a system event log (SEL). An extended SEL (eSEL) is associated with each SEL. It contains additional First Failure Data Capture (FFDC) information for use by the support structure.

For system check-stop errors, the On Chip Controller (OCC) collects Failure Information Register (FIR) data and saves it in nonvolatile memory. PRD analyzes the data upon reboot and creates a SEL and an eSEL. The host Linux operating system can monitor the SELs on the service processor through the IPMI tool. Hardware and firmware failures are recorded in the SELs and can be retrieved through the IPMI interface. The system has the ability to report errors associated with PCIe adapters/devices through the host operating system.

Warranty and spare parts

The system comes with a three-year warranty on parts. The replacement parts can be ordered through the Advanced Part Exchange Warranty Service.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the Product accessibility information website.

Product number

The following are newly announced features on the specific models of the IBM Power Systems™ 8335 machine type:

Description	Machine type	Model	Feature number
IBM Power System AC922	8335	GTG	
NVIDIA Tesla V100 GPU with NVLINK Air-Cooled (16 GB)	8335	GTG	EC4J

The following are features already announced for the IBM Power Systems 8335 machine type:

Description	Machine type	Model	Feature number
One CSC Billing Unit	8335	GTG	0010
Ten CSC Billing Units	8335	GTG	0011
Primary OS - Linux	8335	GTG	2147
Extender Cable - USB Keyboards, 1.8M	8335	GTG	4256
Rack Indicator- Not Factory Integrated	8335	GTG	4650
Software Preload Required	8335	GTG	5000
4.3m (14-Ft) 3PH/24A 380-415V Power Cord	8335	GTG	6489
4.3m (14-Ft) 1PH/63A 200-240V Power Cord	8335	GTG	6491
4.3m (14-Ft) 1PH/48-60A 200-240V Power Cord	8335	GTG	6492
4.3m (14-Ft) 3PH/16A 380-415V Power Cord	8335	GTG	6653
4.3m (14-Ft) 1PH/24-30A Pwr Cord	8335	GTG	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	8335	GTG	6655
4.3m (14-Ft) 1PH/24A Power Cord	8335	GTG	6656
4.3m (14-Ft) 1PH/32A Power Cord	8335	GTG	6657
4.3m (14-Ft) 1PH/24A Pwr Cd-Korea	8335	GTG	6658
4.3m (14-Ft) 3PH/32A 380-415V Power Cord-Australia	8335	GTG	6667
Linux Software Preinstall	8335	GTG	8143
Linux Software Preinstall (Business Partners)	8335	GTG	8144
Language Group Specify - US English	8335	GTG	9300
New Red Hat License Core Counter	8335	GTG	9442
Other Linux License Core Counter	8335	GTG	9445
3rd Party Linux License Core Counter	8335	GTG	9446
Other License Core Counter	8335	GTG	9449
Month Indicator	8335	GTG	9461
Day Indicator	8335	GTG	9462

Hour Indicator	8335	GTG	9463
Minute Indicator	8335	GTG	9464
Qty Indicator	8335	GTG	9465
Countable Member Indicator	8335	GTG	9466
Language Group Specify - Dutch	8335	GTG	9700
Language Group Specify - French	8335	GTG	9703
Language Group Specify - German	8335	GTG	9704
Language Group Specify - Polish	8335	GTG	9705
Language Group Specify - Norwegian	8335	GTG	9706
Language Group Specify - Portuguese	8335	GTG	9707
Language Group Specify - Spanish	8335	GTG	9708
Language Group Specify - Italian	8335	GTG	9711
Language Group Specify - Canadian French	8335	GTG	9712
Language Group Specify - Japanese	8335	GTG	9714
Language Group Specify - Traditional Chinese (Taiwan)	8335	GTG	9715
Language Group Specify - Korean	8335	GTG	9716
Language Group Specify - Turkish	8335	GTG	9718
Language Group Specify - Hungarian	8335	GTG	9719
Language Group Specify - Slovakian	8335	GTG	9720
Language Group Specify - Russian	8335	GTG	9721
Language Group Specify - Simplified Chinese (PRC)	8335	GTG	9722
Language Group Specify - Czech	8335	GTG	9724
Language Group Specify -- Romanian	8335	GTG	9725
Language Group Specify - Croatian	8335	GTG	9726
Language Group Specify -- Slovenian	8335	GTG	9727
Language Group Specify - Brazilian Portuguese	8335	GTG	9728
Language Group Specify - Thai	8335	GTG	9729
QSFP+ 40GBase-SR Transceiver	8335	GTG	EB27
1m (3.3-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	8335	GTG	EB2B
3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	8335	GTG	EB2H
10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable	8335	GTG	EB2J
30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable	8335	GTG	EB2K
AC Power Supply - 2200 WATT (200-240V/277V)	8335	GTG	EB2X
0.5m SFP28/25GbE copper Cable	8335	GTG	EB4J
1.0m SFP28/25GbE copper Cable	8335	GTG	EB4K
1.5m SFP28/25GbE copper Cable	8335	GTG	EB4L
2.0m SFP28/25GbE copper Cable	8335	GTG	EB4M
2.0m QSFP28/100GbE copper split Cable to SFP28 4x25GbE	8335	GTG	EB4P
0.5m EDR IB Copper Cable QSFP28	8335	GTG	EB50
1.0m EDR IB Copper Cable QSFP28	8335	GTG	EB51
2.0m EDR IB Copper Cable QSFP28	8335	GTG	EB52
1.5m EDR IB Copper Cable QSFP28	8335	GTG	EB54
100Gb Optical Transceiver QSFP28	8335	GTG	EB59
3m EDR IB Optical Cable QSFP28	8335	GTG	EB5A
5m EDR IB Optical Cable QSFP28	8335	GTG	EB5B
10m EDR IB Optical Cable QSFP28	8335	GTG	EB5C
15m EDR IB Optical Cable QSFP28	8335	GTG	EB5D
20m EDR IB Optical Cable QSFP28	8335	GTG	EB5E
30m EDR IB Optical Cable QSFP28	8335	GTG	EB5F
50m EDR IB Optical Cable QSFP28	8335	GTG	EB5G
100m EDR IB Optical Cable QSFP28	8335	GTG	EB5H
0.5m 100GbE Copper Cable QSFP28	8335	GTG	EB5J
1.0m 100GbE Copper Cable QSFP28	8335	GTG	EB5K
1.5m 100GbE Copper Cable QSFP28	8335	GTG	EB5L
2.0m 100GbE Copper Cable QSFP28	8335	GTG	EB5M
25m EDR IB Optical Cable QSFP28	8335	GTG	EB5N
3m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5R
5m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5S
10m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5T
15m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5U
20m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5V
30m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5W
50m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5X
100m 100GbE Optical Cable QSFP28 (AOC)	8335	GTG	EB5Y
Open Power non-virtualized configuration	8335	GTG	EC16
PCIe3 LP 2-port 100GbE (NIC& RoCE) QSFP28 Adapter x16	8335	GTG	EC3L
PCIe3 LP 1.6 TB SSD NVMe adapter	8335	GTG	EC5A

PCIe4 LP 1-port 100Gb EDR IB CAPI adapter	8335	GTG	EC62
PCIe4 LP 2-port 100Gb EDR IB CAPI adapter	8335	GTG	EC64
5m (16.4-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	8335	GTG	ECBN
Custom Service Specify, Montpellier, France	8335	GTG	ECSF
Optical Wrap Plug	8335	GTG	ECW0
Marketing Specify - NVIDIA GPU	8335	GTG	EHL9
Rack-mount Fixed Rail Kit	8335	GTG	EJTX
Rack-mount Slide Rail Kit	8335	GTG	EJTY
PCIe2 LP 2-port 10/1GbE BaseT RJ45 Adapter	8335	GTG	EL3Z
PCIe3 LP 2-port 16Gb Fibre Channel Adapter	8335	GTG	EL43
PCIe2 LP 4-port 1GbE Adapter	8335	GTG	EL4M
1 TB 7.2k RPM 5xx SATA SFF-4 Disk Drive	8335	GTG	ELD0
960 GB 2.5-inch SATA/SSD Disk Drive	8335	GTG	ELU4
1.92 TB 2.5-inch SATA/SSD Disk Drive	8335	GTG	ELU5
3.84 TB 2.5-inch SATA/SSD Disk Drive	8335	GTG	ELU6
16 GB DDR4 2666 RDIMM	8335	GTG	EM61
32 GB DDR4 2666 RDIMM	8335	GTG	EM63
64 GB DDR4 2666 RDIMM	8335	GTG	EM64
1m (3.3-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	8335	GTG	EN01
3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	8335	GTG	EN02
5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	8335	GTG	EN03
PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter	8335	GTG	EN0T
PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter	8335	GTG	EN0V
16-core 2.60 GHz (3.09 GHz Turbo) POWER9	8335	GTG	EP0K
20-core 2.0 GHz (2.87 GHz Turbo) POWER9	8335	GTG	EP0M
Power Cord 2m (6.56-foot), Drawer to IBM PDU, 250V/16A	8335	GTG	EPAJ
Power Cord 2.8m (9.18-foot), Drawer to IBM PDU, 250V/16A	8335	GTG	EPAL
Power Cord 4.3m (14.10-foot), Drawer to IBM PDU, 250V/16A	8335	GTG	EPAM
Horizontal PDU Mounting Hardware	8335	GTG	EPTH
High Function 9xC19 PDU: Switched, Monitoring	8335	GTG	EPTJ
High Function 9xC19 PDU 3-Phase: Switched, Monitoring	8335	GTG	EPTL
Bulk Packaging Request ID	8335	GTG	ERB0
Bulk Packaging ID #1	8335	GTG	ERB1
Bulk Packaging ID #2	8335	GTG	ERB2
Bulk Packaging ID #3	8335	GTG	ERB3
Bulk Packaging ID #4	8335	GTG	ERB4
Bulk Packaging ID #5	8335	GTG	ERB5
Bulk Packaging ID #6	8335	GTG	ERB6
Bulk Packaging ID #7	8335	GTG	ERB7
Bulk Packaging ID #8	8335	GTG	ERB8
Bulk Packaging ID #9	8335	GTG	ERB9
Bulk Packaging ID #10	8335	GTG	ERBA
Bulk Packaging ID #11	8335	GTG	ERBB
Bulk Packaging ID #12	8335	GTG	ERBC
Bulk Packaging ID #13	8335	GTG	ERBD
Bulk Packaging ID #14	8335	GTG	ERBE
Bulk Packaging ID #15	8335	GTG	ERBF
Bulk Packaging ID #16	8335	GTG	ERBG
Bulk Packaging ID #17	8335	GTG	ERBH
Bulk Packaging ID #18	8335	GTG	ERBJ
Bulk Packaging ID #19	8335	GTG	ERBK
Bulk Packaging ID #20	8335	GTG	ERBL
No Bulk Packaging Specify	8335	GTG	ERBZ
RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs	8335	GTG	ERF1
2 TB 7.2k RPM 5xx SATA SFF-4 Disk Drive	8335	GTG	ES6A
S&H - No Charge	8335	GTG	ESC0
S&H-a	8335	GTG	ESC5
Standalone USB DVD drive w/cable	8335	GTG	EUA5

Publications

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

- Licenses, notices, safety, and warranty information
- Planning for the system
- Installing and configuring the system
- Troubleshooting, service, and support
- Installing operating systems
- Glossary

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

The following information is shipped with the 8335-GTG server:

- Supporting information for IBM
- IBM Power System AC922 (8335-GTG) (GI11-9916)
- Warranty GI11-4340
- License Agreement for Machine Code Z125-5468

You can access the product documentation at IBM Knowledge Center.

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

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

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

National language support

Not applicable.

Services

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For details on available services, contact your IBM representative or go to the Lab Services website.

Global Technology Services

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

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

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

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

Details on education offerings related to specific products can be found on the IBM authorized training website.

Technical information

Specified operating environment

Physical specifications

- Width: 444.5 mm (17.5 in.)
- Depth: 850.9 mm (33.5 in.)
- Height: 88.9 mm (3.5 in.)
- Weight: 30 kg (66 lb)

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

Operating environment

For some standards and guidelines for operating environment, see the ASHRAE-A2 website.

Software requirements

Red Hat Enterprise Linux 7.4 for Power LE (POWER9), or later

Limitations

- The integrated system ports are supported for modem and asynchronous terminal connections with Linux. Any other application using serial ports requires a serial port adapter to be installed in a PCI slot. The integrated system ports do not support HACMP™ configurations.
- The VGA port does not support cable lengths that exceed 3 meters.

Planning information

Cable orders

No cables required.

Security, auditability, and control

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

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

IBM Systems Lab Services

For details on available services, contact your IBM representative or go to the Lab Services website.

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, or integration of this product.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, go to the IBM Electronic Support website.

Terms and conditions

Volume orders

Contact your IBM representative.

Products - terms and conditions

Warranty period

Three years.

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM. An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty. Unless specified otherwise, the warranty period, type of warranty service,

and service level of a part or feature are the same as those for the machine in which it is installed.

The 960 GB, 1.92 TB, and 3.84 TB Read Intensive 2.5-inch SSDs have a maximum number of write cycles. Failures of these SSDs will be replaced during the standard warranty period for the attached server at IBM's expense, regardless of usage levels. After warranty, 960 GB, 1.92 TB, and 3.84 TB Read Intensive 2.5-inch SSDs are not covered under the IBM Maintenance Agreement, if one is purchased.

NVMe Adapters have a maximum number of write cycles. NVMe device failures will be replaced during the standard warranty period for the attached server at IBM's expense, regardless of usage levels. IBM Maintenance Agreements after the warranty period are limited to devices that have not reached the maximum number of write cycles. Devices that reach this limit may fail to operate according to specifications and must be replaced at the client's expense. Individual service life may vary and can be monitored using an operating system command.

Warranty and additional coverage options:	Coverage summary: [1]
Warranty period:	3 years
Type of Warranty Service:	
Service period:	Customer Replaceable Unit (CRU) including Parts Only next-business-day (NBD), 9 x 5
Service Upgrade options:	
Warranty Service Upgrade:	IBM On-Site Repair, 9 x 5 same-day[2] and 24 x 7 same-day options
Maintenance Services (post-Warranty):	IBM On-Site Repair, Next Business Day and same-day options
IBM Hardware Maintenance Services -- committed maintenance:[3]	Y

[1] See complete coverage details below.

[2] Offered in US and EMEA only.

[3] Not offered in the US.

Warranty services

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

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information.

CRU Service

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

Tier 1 (mandatory) CRU

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

Tier 2 (optional) CRU

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

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

The following parts have been designated as Tier 1 CRUs:

- Hard disk drive
- Optical drive
- Fan
- Fan Cage
- I/O adapters
- Operator panel
- Operator panel cable
- PCI adapters
- Power cord
- Power supply
- Processor power regulator
- Service processor
- RAID card cable
- Memory DIMMs
- Native USB Serial Card
- Keyboard
- Mouse
- External cables
- Display
- Sheet metal trays and dividers
- Planar
- Air duct
- Heat sinks
- Rails

Advanced Part Exchange warranty service

Advanced Part Exchange warranty service allows you to order and track replacement parts directly under Customer Replaceable Unit or Parts Only Service following procedures that are provided by IBM. Replacement parts are shipped to your location for you to install. IBM will use commercially reasonable delivery methods to ship the replacement part for NBD delivery. Advanced Part Exchange warranty service is not available in all countries. You must be approved and registered to use this service. Contact your IBM representative or your reseller for further information.

CRU and On-Site Service

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

Service level is:

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response. Calls must be received by 17:00 local time in order to qualify for next-business-day response.

Warranty services

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

International Warranty Service

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

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

The following types of information can be found on the International Warranty Service website

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

Warranty service upgrades

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

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

Maintenance service options

CRU and On-site Service

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

- IBM On-Site Repair, same day On-Site Response Target, Monday through Friday, excluding public or national holidays from 8:00 to 17:00 local time. Calls must be received by 12:00 local time in order to qualify for same-business-day response.

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

level specified above. For additional information on the CRU Service, see the warranty information.

Maintenance services

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

On-site Service

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

Service levels are:

- IBM On-Site Repair, next-business-day response target, Monday through Friday, during core business.
- IBM On-Site Repair, same day on-site response target, Monday through Friday, excluding public or national holidays from 8:00 to 17:00 local time. Calls must be received by 12:00 local time in order to qualify for same-business-day response.
- IBM On-Site Repair, same day on-site response target, 24 hours per day, 7 days a week.

IBM Hardware Maintenance Services - committed maintenance

Organizations can lose as much as USD100 million per year to downtime related to information and communications technology. IBM Hardware Maintenance Services - committed maintenance can deliver various guaranteed hardware service for IBM equipment from the moment you call for support worldwide (based on the countries in which IBM has a presence) and around the clock. Through clear response targets and standardized service-delivery metrics, IBM helps you optimize your IT infrastructure and reduce the threat of hardware-related outages.

For more information, see the IBM Hardware Maintenance Services website.

Customer Replaceable Unit (CRU) Service

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

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

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

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

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

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

The following parts and features have been designated as Tier 1 CRUs:

- Hard disk drive
- Optical drive
- Fan
- Fan Cage
- I/O adapters
- Operator panel
- Operator panel cable
- PCI adapters
- Power cord
- Power supply
- Processor power regulator
- Service processor
- RAID card cable
- Memory DIMMs
- Native USB Serial Card
- Keyboard
- Mouse
- External cables
- Display
- Sheet metal trays and dividers
- Planar
- Air duct
- Heat sinks
- Rails

To service a Linux system end to end, Linux service and productivity tools must be installed from the Customer care web page.

The tools are automatically loaded if IBM Manufacturing installs the Linux image or IBM Installation Toolkit.

The Linux call home feature is also supported in a stand-alone system configuration to report serviceable events.

Feature numbers or models for which there is a maintenance charge:

Machine type-model	Feature number
8335-GTG	-
8335-GTG	EC4J
8335-GTG	EP0K
8335-GTG	EP0M

Usage plan machine

No

IBM hourly service rate classification

D / Three

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.

Maintenance service offerings

This machine is eligible under terms and conditions of IBM ServiceElite, the IBM Enterprise Service Agreement (ESA), or the IBM Maintenance Agreement. Consult your IBM representative for details.

General terms and conditions

Field-installable features

Yes

Model conversions

No

Machine installation

Installation is performed by IBM. IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 1-800-IBM-SERV (426-7378). In other countries, contact the local IBM office.

Graduated program license charges apply

Yes. The applicable processor group is small.

Licensed Machine Code

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

Access to Machine Code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM in its discretion.

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

Prices

For all local charges, contact your IBM representative.

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   IBM Directory of worldwide contacts

Corrections

(Corrected on June 21, 2018)

Revised the Description and Product number sections.

(Corrected on February 15, 2018)

Revised Overview and Description sections.

(Corrected on January 10, 2018)

Corrected abbreviation in At a glance section.