



IBM PowerLinux 7R2 with EX24S Drawer Support is optimized for Linux to help deliver new solutions and services faster, with higher quality

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At a glance

The PowerLinux 7R2 server is fueled by the outstanding performance and energy efficiency of the IBM® POWER7® processor that has been optimized for the Linux™ operating system running on Power® .

- Powerful 64-bit, 8-core POWER7 processor modules
 - Two 16-core configurations at 3.3 GHz and 3.55 GHz
- Up to 256 GB of memory with optional memory riser cards
- Expansion capabilities for the EXP24S SFF Gen2-bay Drawer
- Rich I/O options in the system unit:
 - Five PCIe Gen2 Low Profile slots
 - PCIe LP 2-Port 1GbE TX adapter (#EL2M -- for SLES 10 operating system) or PCIe2 LP 4-port 1GbE Adapter (#EL11 -- for SLES 11 and RHEL operating systems)
 - Six disk or solid-state drive (SSD) SAS SFF (small form-factor) bays -- up to 3.6 TB
 - Slimline DVD-RAM
 - Bay for tape or removable drive (with #EJ0E)
 - Integrated SAS/SATA controller with RAID 0, 1, and 10 support for disk and SSD; also supports tape and DVD
- EnergyScale™ technology
- Expansion capabilities for storage drawers and 12x PCIe I/O drawers

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

Overview

The IBM PowerLinux™ 7R2 server delivers the outstanding performance of the IBM POWER7 processor in a dense, highly efficient 2U rack-optimized form factor for Linux customers. It is ideal for running multiple Linux infrastructure and application workloads, virtualized with PowerVM™, more economically than traditional Linux servers. Take advantage of the IBM PowerLinux 7R2's scalability and capacity by leveraging IBM's feature-rich PowerVM virtualization technology to fully utilize the

server's capacity and deploy virtual partitions faster as well as move workloads as needed across PowerLinux and Power Systems™ servers with Live Partition Mobility.

The PowerLinux 7R2 server is a Linux only 2U rack-mount server with two processor sockets offering 16-core 3.3 GHz and 3.55 GHz configurations. The new PowerLinux 7R2 (8246-L2S) server also provides expanded I/O capabilities using the high-performance Gen2 PCIe interfaces, and adds the capability of additional I/O via the 12x PCIe I/O expansion drawers.

The PowerLinux 7R2 server supports a maximum of 16 DDR3 DIMM slots, with four DIMM slots included in the base configuration and 12 DIMM slots available with three optional memory riser cards, allowing for a maximum system memory of 256 GB.

Memory features (two memory DIMMs per feature) supported are 8 GB, 16 GB, and 32 GB and run at speeds of 1066 MHz. Also, PowerVM now features Active Memory™ Sharing, the technology that allows you to intelligently exchange memory between running partitions for increased optimization of physical memory resources. Active Memory Sharing enables the sharing of a pool of physical memory among logical partitions (LPARs) on a single server, helping to increase memory utilization and drive down system costs.

The PowerLinux 7R2 server offers three storage backplane options. The first supports three SFF SAS HDDs or SSDs, an SATA DVD, and a half-high tape drive. The second supports six SFF SAS HDDs or SSDs and an SATA DVD. These two choices both provide an integrated SAS controller, offering RAID 0, 1, and 10 support. The third supports six SFF SAS HDDs or SSDs, an SATA DVD, and adds support for Dual Write Cache RAID 5, RAID 6, and an external SAS port. HDDs and SSDs are hot-swap and front accessible with each of the three alternatives.

Other integrated features include:

- Five PCIe x8 Gen2 Low Profile expansion slots.
- PCIe LP 2-Port 1GbE TX adapter (#EL2M -- for SLES 10 operating system) or PCIe2 LP 4-port 1GbE Adapter (#EL11 -- for SLES 11 and RHEL operating systems).
- Two GX++ slots for 12X I/O loop.
- Service Processor.
- Integrated SAS/SATA controller for HDD, SSD, tape, and DVD in the system unit, supporting RAID 0, 1, and 10. RAID 5 and RAID 6 are available.
- EnergyScale technology.
- Two system ports, three USB ports, and two HMC ports.
- Redundant and hot-swap power.
- Redundant and hot-swap cooling.

Knowledge gained from IBM Watson™ architected on 90 scale-out POWER7-based systems running Linux has been built into the PowerLinux 7R2 server. The PowerLinux system is specifically designed for emerging workloads that are proven ideal for a virtualized scale-out, Linux server environment. The PowerLinux 7R2 server benefits from POWER7 performance, Intelligent Threads technology, and high memory and I/O bandwidth. Like Watson, these workloads benefit from POWER7 processor performance, virtualization efficiencies, unique workload optimizing features, and industry-leading reliability, availability, and scalability at prices comparable with traditional Linux servers.

IBM is investing in new technologies to further advance the value of the PowerLinux 7R2 server for the following emerging and traditional workloads:

Big data analytics

Companies want to deliver actionable insights faster with optimized solutions that process structured and unstructured data on a massive scale. IBM PowerLinux Big Data Analytics solutions offer breakthrough solutions for big data analytics. The IBM PowerLinux Big Data Edition for InfoSphere® BigInsights enables organizations

to mine data-at-rest, and the IBM PowerLinux Big Data Edition for InfoSphere Streams analyzes data-in-motion. IBM PowerLinux big data solutions are optimized for both types of data to help businesses deliver analytics services faster by taking advantage of the workload-optimizing features of the POWER7 architecture that specifically apply to big data:

Run thousands of tasks in parallel with:

- Eight higher frequency cores per socket
- Four intelligent threads per core
- Larger on-chip cache (eDRAM)

Achieve massive scale-out flexibility with:

- Choice of dense rack or compute nodes
- High-speed, low-latency interconnect
- Similar pricing to x86 rack/compute node

Exploit extreme memory bandwidth:

- Higher memory bandwidth of other commercially available systems

The IBM InfoSphere BigInsights based PowerLinux solution uses the open source Apache Hadoop framework and other open source and IBM value-added technologies for distributed processing of large data sets across clusters of computers. This big data solution can help companies analyze social media sites for the latest buzz about their products, for example, and take action to boost sales.

The IBM InfoSphere Streams based solution analyzes data-in-motion. Designed to manage stream flows and apply various analytics against streaming data, companies can store less, analyze more, and make better decisions, faster. By extracting insight from data as it is streaming into your organization, you can react to events as they are happening to change business outcomes. For example, financial institutions can inspect real-time credit card usage to detect and prevent fraudulent transactions.

The IBM PowerLinux Big Data Edition for InfoSphere Streams performs complex real-time analytics on data-in-motion. Enterprises can seamlessly extend existing applications with data mining capabilities and scale to any size PowerLinux cluster. The IBM PowerLinux Big Data Edition for InfoSphere Streams also leverages GPFS™, IBM's industry-leading cluster file system.

Industry application solutions

More companies are relying on Linux for business applications that are designed for their industry and tuned for specific business needs. PowerLinux provides a highly secure, resilient, and fully optimized stack for industry applications, enabling faster time-to-delivery for new, differentiating services with less downtime. Optimized systems tuned with PowerLinux offer a lower cost per workload for high quality businesses services compared to x86 commodity servers. Solutions for government, banking, manufacturing, and others are available in several local markets.

IBM PowerLinux Solution Edition for SAP Applications delivers a single-system SAP environment for midsize businesses, supporting up to 500 SAP users on the competitively priced IBM PowerLinux 7R2 server with IBM PowerVM and IBM DB2®. The IBM PowerLinux 7R2 server provides the ideal platform to consolidate multiple x86 server workloads onto a single server. SAP production, development, test, and database environments can run on a single-high-performing, efficient, and reliable server. Consolidation of the SAP and database environments simplifies administration and maintenance for SAP applications and lowers IT costs for midsize businesses.

The IBM PowerLinux Solution Edition for SAP Applications leverages IBM PowerVM for IBM PowerLinux that is optimized for the Linux operating system and is offered exclusively on the IBM PowerLinux servers. IBM PowerVM for IBM PowerLinux

incorporates all the features of PowerVM Enterprise Edition and provides unique advanced capabilities for Linux environments, including the ability to dynamically remove memory from running virtual machines (VMs) and reallocate it to other VMs and the ability to enhance performance by automatically reacting to anticipated and unanticipated spikes in server demand.

IBM PowerVM for IBM PowerLinux offers new pricing for cost-effective virtualized workload environments. With lower virtualization costs, you receive IT savings through the total cost of acquisition (TCA) and the total cost of ownership (TCO).

The IBM PowerLinux Solution Edition for SAP Applications supports SAP's POWER7 certified products like SAP Business Suite and SAP Solution Manager with IBM DB2 V9.7. SAP products are available for order from SAP or SAP Business Partners.

Open source infrastructure Services

Today, Linux is the low-cost deployment platform of choice for vital applications like web, email, and social media collaboration. Companies are replacing more expensive infrastructure applications with robust open source offerings running on Linux, and running them in virtualized environments. With IBM PowerLinux Open Source Infrastructure Services you can run key infrastructure workloads with industry standards-based Linux on competitively priced PowerLinux servers. Open source applications for PowerLinux are included with commercial Linux distributions from Red Hat and SUSE, and supported by Red Hat, SUSE or IBM. Open source applications like email, file and print, web, and network infrastructure can be installed and configured in the IBM PowerLinux Open Source Infrastructure Services solution using the IBM Installation Toolkit. The IBM Installation Toolkit simplifies the setup of your workloads by stepping you through their configuration.

The IBM PowerLinux Open Source Infrastructure Services leverages IBM PowerVM for IBM PowerLinux for efficient server virtualization. IBM PowerLinux Open Source Infrastructure Services PowerVM technology is designed to help IBM Power Systems servers deliver higher server utilization rates than through greater throughput per workload. Running open source application workloads on a single server reduces costly IT administration, energy consumption, data center space, and other expenses associated with the deployment and maintenance of numerous servers. IBM can offer a superior economic model for workload consolidation on POWER7 servers with PowerVM software -- a key driver behind recent migrations from Oracle (Sun) and HP to Power Systems technology.

IBM PowerVM for IBM PowerLinux offers advanced virtualization functionality and is offered exclusively on the IBM PowerLinux servers. IBM PowerVM for IBM PowerLinux's pricing structure delivers cost-effective virtualized workload environments. PowerVM technology is designed to provide secure and scalable virtualization and to control server and virtual image sprawl.

ISV industry and cross-industry solutions

IBM is working with worldwide ISVs like SAP along with regional ISVs to optimize and exploit integrated PowerVM virtualization functionality and superior performance of the PowerLinux 7R2 with their business application suites. In addition, a growing portfolio of thousands of applications is available from global and regional ISVs for the PowerLinux 7R2 server. To search for ISV applications available for the new PowerLinux 7R2 server along with the associated Linux distributions, see the IBM Global Solutions Directory

<http://www-304.ibm.com/partnerworld/gsd/homepage.do>

To see the full list of available applications that will be compatible to run on the PowerLinux 7R2 server, use the following in your search criteria:

- Choose the following hardware platforms:
 - IBM Power Systems, IBM System p® (pSeries®), and IBM BladeCenter® JSxx and PSxx (POWER® processor-based)
- Choose from the following operating systems:

- Red Hat Enterprise Linux : RHEL5 or RHEL6
- SUSE Linux Enterprise Server: SLES10 or SLES11
- Other Linux distribution

IBM Software

In addition, IBM Software provides a growing portfolio of solution stacks and services optimized for PowerLinux, including:

- Web Infrastructure with optional database and enterprise integration
- Data Management and Analytics for structured and unstructured data
- Web Portals
- Storage Management

Key prerequisites

Refer to the [Hardware requirements](#) section and [Software requirements](#) section.

Planned availability date

June 15, 2012, except for features EJPA, EJPB, EJPC, EJPD, EJPJ, EJPK, EJPL, EJPM, and EJPN, which have a planned availability date of June 22, 2012.

Description

IBM PowerLinux 7R2

Summary of standard features:

- Rack-mount (2U) configuration
- 8-core processor modules, offering the following configurations
 - 16-core 3.3 GHz and 3.55 GHz
- 8 GB, 16 GB, or 32 GB of 1066 MHz DDR3 ECC memory (error checking and correcting)
 - A minimum 32 GB of memory is required with 3.55 GHz configuration (ELB5). A system must be ordered with a minimum/maximum of 4 x #EL15, 2 x #EL16, or 1 x #EL17. Maximum memory is 256 GB.
 - A minimum 64 GB or memory is required with 3.3 GHz configuration (ELB4). A system must be ordered with a minimum/maximum of 4 x #EL15, or 2 x #EL16, or 1 x #EL17 and 32 GB of additional low-priced memory from memory features EL1F, EL1G, and EL1H. Maximum memory is 256 GB.
- Three storage backplane options:
 - Three SFF SAS HDDs/SSDs, SATA DVD bay, tape drive bay
 - Six SFF SAS HDDs/SSDs, SATA DVD bay
 - Six SFF SAS HDDs/SSDs, SATA DVD bay, Dual Write Cache SAS RAID, external SAS port
- Five PCIe x8 Gen2 and one PCIe x4 Gen2 Low Profile slots
- Two GX++ slots
- Integrated:
 - Service Processor
 - EnergyScale technology
 - Hot-swap and redundant cooling

- Three USB ports, two system ports, and two HMC ports
- Two 1725 Watt AC, Hot-swap power supplies

Certain configurations of the PowerLinux 7R2 are Energy Star Qualified. Refer to

http://www-03.ibm.com/systems/hardware/energy_star/index.html

The PowerLinux 7R2 server is ordered using either feature number ELB4 for a configuration with two POWER7 3.3 GHz processor modules or feature number ELB5 for a configuration with two POWER7 3.55 GHz processor modules.

In addition to the two processor modules, the minimum PowerLinux 7R2 initial order must include 16 processor activations, 32 GB of memory with ELB5 and 64 GB of memory with ELB4, two HDD/SDDs, an Ethernet adapter, a storage backplane, two power supplies and two power cords, an operating system indicator, and a Language Group Specify.

The minimum defined initial order configuration, if no choice is made, is as follows:

Feature number	Description
ELB4	Package indicator that includes:
2 x EPL4	0/8 core 3.3 GHz POWER7 Processor Module (with ELB4)
16 x EPL9	16 Processor Activations (Zero-priced)
2 x EL16	32 GB Memory (Zero-priced)
1 x EL1H	32 GB Memory
2 x EL03	146.8 GB 15k SFF HDD
ELB5	Package indicator that includes:
2 x EPL5	0/8 core 3.55 GHz POWER7 Processor Module (with ELB5)
16 x EPLA	16 Processor Activation (Zero-priced)
2 x EL16	32 GB Memory (Zero-priced)
2 x EL03	146.8 GB 15k SFF HDD
EL0T	Storage Backplane for 2.5-inch Drives/SATA DVD/Tape (Zero-priced)
EL11	PCIe2 LP 4-port 1GbE Adapter (\$0)
or	
EL2M(1)	2-Port 10/100/1000 Base-TX Ethernet PCI Express
2 x 5603	Power Supply, 1725 watt AC
9300/97xx	Language Group Specify
2147	Primary Operating System Indicator - Linux (#2147)
2 x 6	Two Power Cords

¹ Feature number EL2M is required with SUSE Linux Enterprise Server 10.

Notes :

- The first two memory features chosen on an initial order are installed in the nonfeaturized memory riser card. When 4 x #EL15 are chosen to meet the minimum memory requirements, 1 x #ELOA must be ordered. Feature number ELOA is not allowed with feature number EL16 or EL17.
- Alternative configuration options are available on a special bid basis from your IBM representative or Business Partner.
- No internal DASD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel or Fibre Channel over Ethernet adapter must be ordered if feature 0837 is selected.

Dynamic logical partitioning

The dynamic logical partitioning (LPAR) function provides enhanced resource management for the PowerLinux 7R2 server. Dynamic LPAR allows available system resources to be quickly and easily configured across multiple logical partitions to meet the rapidly changing needs of your business.

Dynamic LPAR also allows you to add new system resources such as new HDDs or SSDs into your system's configuration without requiring a reboot. If the IBM PowerVM for IBM PowerLinux feature (#EC22) is installed in the system, a maximum of 10 dynamic LPARs for each physical processor can be defined, with a PowerLinux 7R2 system maximum of 160 dynamic LPARs.

- If implementing Dynamic Logical Partitioning:
 - An HMC or IVM is required to manage POWER7 processor-based servers implementing partitioning. Multiple POWER7 processor-based servers can be supported by a single HMC.
 - If an HMC is used to manage any POWER7 processor-based server, the HMC must be a CR3, or later, model rack-mount HMC or C05, or later, deskside HMC.
 - When IBM Systems Director is used to manage an HMC or if the HMC manages more than 254 partitions, the HMC should have 3 GB of RAM minimum and be a CR3 model, or later, rack-mount or a C06, or later, deskside. SDMC cannot be managed by Systems Director at this time.
- If installing IBM Systems Director:
 - IBM Systems Director Editions for Power Systems 6.3, or later
- If installing IBM Systems Director VMControl™ :
 - IBM Systems Director VMControl 2.4, or later, is required.
 - VMControl is included in IBM Systems Director Express® Edition.
 - IBM PowerVM is required to run VMControl.
 - VMControl Enterprise Edition requires IBM Systems Director V6.3, or later. If the product is installed on an older version of IBM Systems Director, you will be prompted to perform an upgrade before accessing full functionality.

IBM PowerVM for IBM PowerLinux (#EC22)

Either IBM PowerVM for PowerLinux or GPFS is required on the PowerLinux 7R2.

IBM PowerVM for IBM PowerLinux allows customers to create partitions in units of less than 1 CPU (sub-CPU LPARs) and allow the same system I/O to be virtually added to these partitions. The feature also includes a software component that provides cross-partition workload management.

IBM PowerVM for IBM PowerLinux offers:

- Micro-Partitioning® (up to 10 partitions per processor core, 160 per PowerLinux 7R2 system)
- Virtualized disk and optical devices (VIOS)
- Automated CPU reconfiguration
- Real-time partition configuration and load statistics
- Support for dedicated and shared processor LPAR groups
- Support for manual provisioning of resources

At initial order entry, selecting feature number EC22 will result in Micro-Partitioning to be enabled during manufacture and the enabling software media and publications to be shipped to the customer. When ordering feature number EC22 as an MES, an activation key will be posted on an IBM website, and the customer must retrieve it and install it on the system.

The IBM website is

<http://www-912.ibm.com/pod/pod>

Notes® for IBM PowerVM for IBM PowerLinux :

- If implementing IBM PowerVM for IBM PowerLinux :
 - IBM PowerVM 2.2, or later, is required

- Virtual machines, or logical partitions (LPARs), are managed using built-in Integrated Virtualization Manager (IVM) software or optionally through use of the a Hardware Management Console (HMC).
- If any processors in a system have the Virtualization feature, all active processors must have it.
- Once the Virtualization feature is installed in a system, it cannot be removed.
- IBM PowerVM 2.2, or later, and a supported Linux operating system level are minimum requirements for performing Live Partition Mobility functions on POWER7 . Refer to the [Software requirements](#) section for more information on minimum Linux operating system levels.
- Active Memory Sharing is supported with RHEL 6 and SLES 11 SP1.

Other features of IBM PowerVM for IBM PowerLinux :

- If any processors in a system have the Virtualization feature, all active processors must have it.
- Once the Virtualization feature is installed in a system, it cannot be removed.
- Virtual Ethernet and Virtual Storage are part of PowerVM Editions.

IBM PowerVM for IBM PowerLinux also includes Live Partition Mobility, which allows for the movement of a logical partition from one POWER6® or POWER7 server to another with no application downtime, and Active Memory Sharing, which dynamically reallocates memory between running logical partitions on a server.

Note: PowerVM 2.1.2.11 with Fix Pack 22.1 and Service Pack 1, or later, and a supported Linux operating system level are minimum requirements for performing Live Partition Mobility functions on POWER7 . Refer to the [Software requirements](#) section for more information on minimum Linux operating system levels.

I/O drawer availability

One disk-only I/O drawer is supported on the PowerLinux 7R2, providing large storage capacity and multiple partition support:

- Feature 5887 EXP24S holds 2.5-inch SAS disks or SSDs.

A single feature 5887 drawer can be cabled to the CEC external SAS port when a feature EL0V or EL0Y DASH backplane is installed in the 8246-L2S. A 3 Gbps YI cable (#EL2L) is used to connect the drawer to the CEC external SAS port.

EXP24S SFF Gen2-bay Drawer (#5887 or #EL1S (Reduced price))

The EXP24S SFF Gen2-bay Drawer is an expansion drawer with twenty-four 2.5-inch SFF SAS bays. It supports up to 24 hot-swap SFF SAS HDDs on POWER6 or POWER7 servers in 2U of 19-inch rack space. The EXP24S bays are controlled by SAS adapters/controllers attached to the I/O drawer by SAS X or Y cables.

The EXP24S uses Gen2 or SFF-2 SAS drives that physically do not fit in the Gen1 or SFF-1 bays of the POWER7 system unit or 12X PCIe I/O Drawers or vice versa.

The following SFF-2/Gen2 SAS drives can be used in the EXP24S with the PowerLinux 7R2:

- HDDs
 - 10k RPM 300 GB (#EL1N/#EL1P)
 - 10k RPM 600 GB (#EL1Q)
 - 15k RRM 146 GB (#EL1M)
- SSDs
 - 177 GB (#EL1K)

The SAS adapters/controllers that support the EXP24S are:

- PCIe Dual-x4 SAS Adapter 3 Gb (#EL10)

Up to 24 HDDs can be supported with any of the supported SAS adapters/controllers.

The EXP24S has a fixed-length set of rails that allows it to fit in standard Power Systems 19-inch racks such as the 7014-T42 or 7014-T00 or the feature 0551 or 0553.

19-inch racks

The PowerLinux 7R2 (8246-L2S) is designed to mount in the 36U 7014-T00 (#0551) or the 42U 7014-T42 (#0553) rack. These racks are built to the 19-inch EIA standard. When you order a new 8246 system, you can also order the appropriate 7014 rack model with the system hardware on the same initial order. IBM is making the racks available as features of the 8246-L2S when you order additional I/O drawer hardware for an existing system (MES order). The rack feature number should be used if you want IBM to integrate the newly ordered I/O drawer in a 19-inch rack before shipping the MES order.

1.8-meter rack (#0551)

The 1.8-meter rack (#0551) is a 36 EIA unit rack. The rack that is delivered as feature 0551 is the same rack delivered when you order the 7014-T00 rack; the included features may be different. Some features that are delivered as part of the 7014-T00 must be ordered separately with the feature 0551. Order the feature 0551 only when required to support rack integration of MES orders prior to shipment from IBM .

2.0-meter rack (#0553)

The 2.0-meter rack (#0553) is a 42 EIA unit tall rack. The rack that is delivered as feature 0553 is the same rack delivered when you order the 7014-T42 rack; the included features may be different. Some features that are delivered as part of the 7014-T42 must be ordered separately with the feature 0553. Order the feature 0553 only when required to support rack integration of MES orders prior to shipment from IBM .

IBM Power Systems Deployment-ready Services

IBM offers a portfolio of integration, configuration, and customization services for IBM Power Systems . These Deployment-ready Services are designed to accelerate customer solution deployment and reduce related resources and cost. Offerings include:

- Integration
 - Component integration
 - Rack integration
 - Operating system preinstallation
 - Unit personalization
 - Third-party hardware/software installation
 - Customer-specified placement
- Asset tagging: Standard tagging Radio Frequency Item Device (RFID)
- Special packaging: Box consolidation
- System customization: Remote access partitioning customized operating system/firmware

For more information on Deployment-ready Services, refer to

<http://www.ibm.com/power/deploymentreadyservices/>

Reliability, availability, and serviceability (RAS) features

Reliability, fault tolerance, and data correction

The reliability of systems starts with components, devices, and subsystems that are designed to be highly reliable. The POWER7 processor SCM uses lower-voltage technology, improving reliability with stacked latches to reduce soft error (SER) susceptibility. During the design and development process, subsystems go through rigorous verification and integration testing processes. During system manufacturing, systems go through a thorough testing process to help ensure the highest level of product quality.

The system cache and memory offer ECC (error checking and correcting) fault-tolerant features. ECC is designed to correct environmentally induced, single-bit, intermittent memory failures and single-bit hard failures. With ECC, the likelihood of memory failures will be reduced. ECC also provides double-bit memory error detection that helps protect data in the event of a double-bit memory failure.

The Linux operating system supports disk drive mirroring (RAID 1) through software, while other RAID protection schemes are provided via hardware RAID adapters.

Memory error correction extensions

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

Memory protection features include scrubbing to detect errors, a means to call for the deallocation of memory pages for a pattern of correctable errors detected, and signaling deallocation of a logical memory block when an error occurs that cannot be corrected by the ECC code.

Fault monitoring functions

- When a POWER7 processor-based system is initially powered on, BIST (built-in self-test) and POST (power-on self-test) check processor, cache, memory, and associated hardware required for proper booting of the operating system. If a noncritical error is detected or if the errors occur in resources that can be removed from the system configuration, the restarting process is designed to proceed to completion. The errors are logged in the system nonvolatile RAM (NVRAM).
- Disk drive fault tracking is designed to alert the system administrator of an impending disk drive failure before it impacts customer operation.

Mutual surveillance

The Service Processor monitors the operation of the firmware during the boot process, and also monitors the hypervisor for termination. The hypervisor monitors the Service Processor and will perform a reset/reload if it detects the loss of the Service Processor. If the reset/reload does not correct the problem with the Service Processor, the hypervisor will notify the operating system and the operating system can take appropriate action, including calling for service.

Environmental monitoring functions

POWER7 based servers include a range of environmental monitoring functions:

- Temperature monitoring warns the system administrator of potential environmental-related problems by monitoring the air inlet temperature. When the inlet temperature rises above a warning threshold, the system initiates an orderly shutdown. When the temperature exceeds the critical level or if the temperature remains above the warning level for too long, the system will shut down immediately.

- Fan speed is controlled by monitoring actual temperatures on critical components and adjusting accordingly. If internal component temperatures reach critical levels, the system will shut down immediately, regardless of fan speed. When a redundant fan fails, the system calls out the failing fan and continues running. When a nonredundant fan fails, the system shuts down immediately.

Availability enhancement functions

The POWER7 family of systems continues to offer and introduce significant enhancements designed to increase system availability.

POWER7 processor functions

As in POWER6 , the POWER7 processor has the ability to do processor instruction retry and alternate processor recovery for a number of core-related faults. This significantly reduces exposure to both hard (logic) and soft (transient) errors in the processor core. Soft failures in the processor core are transient (intermittent) errors, often due to cosmic rays or other sources of radiation, and generally are not repeatable. When an error is encountered in the core, the POWER7 processor will first automatically retry the instruction. If the source of the error was truly transient, the instruction will succeed and the system will continue as before. On IBM systems prior to POWER6 , this error would have caused a checkstop.

Hard failures are more difficult, being true logical errors that will be replicated each time the instruction is repeated. Retrying the instruction will not help in this situation. As in POWER6 , POWER7 processors have the ability to extract the failing instruction from the faulty core and retry it elsewhere in the system for a number of faults, after which the failing core is dynamically deconfigured and called out for replacement. These systems are designed to avoid a full system outage.

POWER7 single processor checkstopping

As in POWER6 , POWER7 provides single processor checkstopping. This significantly reduces the probability of a fault in any one processor affecting total system availability.

Partition availability priority

Also available is the ability to assign availability priorities to partitions. If an alternate processor recovery event requires spare processor resources in order to protect a workload, when no other means of obtaining the spare resources is available, the system will determine which partition has the lowest priority and attempt to claim the needed resource. On a properly configured POWER7 processor-based server, this allows that capacity to be first obtained from, for example, a test partition instead of a financial accounting system.

POWER7 cache availability

The POWER processor-based line of servers continues to be at the forefront of cache availability enhancements. The L3 cache is now integrated on the POWER7 processor. The POWER7 processor provides both L2 and L3 cache line delete functions.

Special uncorrectable error handling

Special Uncorrectable Error (SUE) handling was an IBM innovation introduced for POWER5 processors, where an uncorrectable error in memory or cache does not immediately cause 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.

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.

Predictive failure and dynamic component deallocation

Servers with POWER processors have long had the capability to perform predictive failure analysis on certain critical components such as processors and memory. When these components exhibit certain symptoms that may indicate a failure is imminent, the system can dynamically deallocate and call home, when enabled, about the failing part before the error is propagated system-wide. In many cases, the system will first attempt to reallocate resources in such a way that will avoid unplanned outages. In the event that insufficient resources exist to maintain full system availability, these servers will attempt to maintain partition availability by user-defined priority.

Uncorrectable error recovery

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

Serviceability

The purpose of serviceability is to repair the system while attempting to minimize or eliminate service cost (within budget objectives), while maintaining high customer satisfaction. Serviceability includes system installation, MES (system upgrades/downgrades), and system maintenance/repair. Depending upon the system and warranty contract, service may be performed by the customer, an IBM representative, or an authorized warranty service provider.

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

- Design for Customer Set Up (CSU), Customer Installed Features (CIF), and Customer Replaceable Units (CRU)
- Error detection and Fault Isolation (ED/FI)
- First Failure Data Capture (FFDC)
- Converged service approach across multiple IBM server platforms

Service environments

The HMC is a dedicated server that provides functions for configuring and managing servers for either partitioned or full-system partition using a GUI or command-line interface (CLI). An HMC attached to the system allows support personnel (with client authorization) to remotely log in to review error logs and perform remote maintenance if required.

The POWER7 processor-based platforms support two main service environments:

- Attachment to one or more HMCs is a supported option by the system. This is the default configuration for servers supporting logical partitions with dedicated or virtual I/O. In this case, all servers have at least one logical partition.
- No HMC. There are two service strategies for non-HMC systems.
 - Full system partition: A single partition owns all the server resources and only one operating system may be installed.
 - Partitioned system: In this configuration, the system can have more than one partition and can be running more than one operating system. In this environment, partitions are managed by the Integrated Virtualization Manager (IVM), which provides some of the functions provided by the HMC.

Service Interface

The Service Interface allows support personnel to communicate with the service support applications in a server using a console, interface, or terminal. Delivering

a clear, concise view of available service applications, the Service Interface allows the support team to manage system resources and service information in an efficient and effective way. Applications available via the Service Interface are carefully configured and placed to give service providers access to important service functions.

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

- LEDs
- Operator Panel
- Service Processor menu
- Operating system service menu
- Service Focal Point™ on the HMC
- Service Focal Point Lite on IVM

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

First Failure Data Capture and Error Data Analysis

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

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

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

Diagnostics

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

- Provide a common error code format equivalent to a system reference code, system reference number, checkpoint, or firmware error code
- Provide fault detection and problem isolation procedures
- Support remote connection ability to be used by the IBM Remote Support Center or IBM Designated Service
- Provide interactive intelligence within the diagnostics with detailed online failure information while connected to IBM's back-end system

Automatic diagnostics

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

Stand-alone diagnostics

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

- Compact disk-based diagnostics
- Keying in commands
- Interactively selecting steps from a list of choices

Concurrent maintenance

The system will continue to support concurrent maintenance of power, cooling, HDD or SSD, DVD, and firmware updates (when possible). The determination of whether a firmware release can be updated concurrently is identified in the readme information file released with the firmware.

Service labels

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

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

Packaging for service

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

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

Error handling and reporting

In the event of system hardware or environmentally induced failure, the system runtime error capture capability systematically analyzes the hardware error

signature to determine the cause of failure. The analysis result will be stored in system NVRAM. When the system can be successfully restarted either manually or automatically, the error will be reported to the operating system. Error Log Analysis (ELA) can be used to display the failure cause and the physical location of the failing hardware.

With the integrated Service Processor, the system has the ability to automatically send out an alert via phone line to a pager or call for service in the event of a critical system failure. A hardware fault will also turn on the amber system fault LED located on the system unit to alert the user of an internal hardware problem. The indicator may also be set to blink by the operator as a tool to allow system identification. For identification, the blue locate LED on the enclosure and at the system level will turn on solid. The amber system fault LED will be on solid when an error condition occurs.

On POWER7 processor-based servers, hardware and software failures are recorded in the system log. When an HMC is attached, an ELA routine analyzes the error, forwards the event to the Service Focal Point (SFP) application running on the HMC, and notifies the system administrator that it has isolated a likely cause of the system problem. The Service Processor event log also records unrecoverable checkstop conditions, forwards them to the SFP application, and notifies the system administrator. Once the information is logged in the SFP application, if the system is properly configured, a call home service request will be initiated and the pertinent failure data with service parts information and part locations will be sent to an IBM service organization. Customer contact information and specific system-related data such as the machine type, model, and serial number, along with error log data related to the failure are sent to IBM Service.

Service Processor

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

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

Call home

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

IBM Electronics Services

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

Integrated in the operating system in addition to the HMC, Electronic Service Agent is designed to automatically and electronically report system failures and customer-perceived issues to IBM , which can result in faster problem resolution and increased availability. System configuration and inventory information collected by Electronic Service Agent also can be viewed on the secure Electronic Services web portal and used to improve problem determination and resolution between the customer and the IBM support team. As part of an increased focus to provide even better service to IBM customers, Electronic Service Agent tool configuration and activation comes standard with the system. In support of this effort, a new HMC External Connectivity security whitepaper has been published, which describes data exchanges between the HMC and the IBM Service Delivery Center (SDC) and the methods and protocols for this exchange. To read the whitepaper and prepare for Electronic Service Agent installation, go to the "Reference Guide" section at

<http://www.ibm.com/support/electronic>

Select your country.

Click on " IBM Electronic Service Agent Connectivity Guide."

Benefits

Increased uptime

Electronic Service Agent is designed to enhance the warranty and maintenance service by providing faster hardware error reporting and uploading system information to IBM Support. This can optimize the time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. And 24 x 7 monitoring and reporting means no more dependency on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security

Electronic Service Agent is secure in monitoring, reporting, and storing the data at IBM . Electronic Service Agent securely transmits via the Internet (HTTPS or VPN) and can be configured to communicate securely through gateways to provide customers a single point of exit from their site. Communication between the customer and IBM only flows one way. Activating Service Agent does not enable IBM to call into a customer's system. System inventory information is stored in a secure database, which is protected behind IBM firewalls. The customer's business applications or business data is never transmitted to IBM .

More accurate reporting

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

Customized support

Using the IBM ID entered during activation, customers can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Services website.

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

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

For more information on how to utilize the power of IBM Electronic Services, visit the following website or contact an IBM Systems Services Representative

<http://www.ibm.com/support/electronic>

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Section 508 of the US Rehabilitation Act

IBM PowerLinux 7R2 server is capable as of June 15, 2012, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Statement of general direction

Red Hat intends to support the PCIe Gen2 2-Port 10Gb Ethernet RoCE SFP+ Adapter (FC #EL27) with an upcoming Red Hat Enterprise Linux 6 minor release. Red Hat plans availability for such update for the second quarter 2012. For additional questions about the availability of this release, contact Red Hat.

Information concerning Red Hat Enterprise Linux was obtained from Red Hat. Questions concerning Red Hat Enterprise Linux should be directed to Red Hat, as Red Hat Enterprise Linux is not an IBM product. Red Hat Enterprise Linux is sold or licensed, as the case may be, to users under Red Hat's terms and conditions. Availability and support is the responsibility of Red Hat. IBM IS NOT LIABLE AND MAKES NO WARRANTIES, EXPRESS OR IMPLIED, REGARDING RED HAT ENTERPRISE LINUX, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OR CONDITION OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Moreover, all statements regarding IBM's or Red Hat's future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only. Information regarding potential future third-party products that may work with an IBM product should not be relied on in making a purchase decision. The information mentioned regarding potential future third-party products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future third-party products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for IBM or Red Hat products remains at IBM's or Red Hat's sole discretion, as applicable.

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any future features or functionality described for our products remains at our sole discretion.

Reference information

Refer to Software Announcement [212-012](#), dated April 24, 2012 (IBM PowerVM for IBM PowerLinux).

Refer to Software Announcement [212-020](#), dated April 24, 2012 (Red Hat Enterprise Linux for IBM POWER).

Refer to Hardware Announcement [112-063](#), dated April 24, 2012 (PowerLinux 7R2).

Product number

The following are newly announced features on the specific models of the IBM Power Systems 8246 machine type:

Description	Machine type	Model	Feature number
IBM PowerLinux 7R2	8246	L2S	
SSD Placement Indicator - 5887	8246	L2S	0465
Load Source Not in CEC	8246	L2S	0719
Specify #5887 Load Source placement	8246	L2S	0728
USB External Docking Station for Removable Disk Drive	8246	L2S	1104
System port/UPS Conversion Cable	8246	L2S	1827
PCIe2 LP 4-port 1GbE Adapter	8246	L2S	5260
PCIe2 LP 4-Port 10GbE&1GbE SFP+ Copper&RJ45	8246	L2S	5279
PCIe2 LP 4-Port 10GbE&1GbE SR&RJ45 Adapter	8246	L2S	5280
PCIe2 LP 2-Port 4X IB QDR Adapter 40Gb	8246	L2S	5283
PCIe2 LP 2-port 10GbE SR Adapter	8246	L2S	5284
PCIe2 LP 2-Port 10GbE SFP+ Copper Adapter	8246	L2S	5286
EXP24S SFF Gen2-bay Drawer	8246	L2S	5887
specify mode-1 & (1)5901/5278 for EXP24S #5887	8246	L2S	9359
Specify mode-1 & (2)5901/5278 for EXP24S #5887	8246	L2S	9360
Specify mode-2 & (2)5901/5278 for EXP24S #5887	8246	L2S	9361
Specify mode-4 & (4)5901/5278 for EXP24S #5887	8246	L2S	9365
Specify mode-2 & (4)5901/5278 for EXP24S #5887	8246	L2S	9366
Specify mode-1 & CEC SAS port for EXP24 #5887	8246	L2S	9384
IBM PowerVM for IBM PowerLinux	8246	L2S	EC22
Specify Mode-1 & (1)ESA1/ESA2 for EXP24S #5887	8246	L2S	EJP1
Specify Mode-1 & (2)ESA1/ESA2 for EXP24S #5887	8246	L2S	EJP2
Specify Mode-2 & (2)ESA1/ESA2 for EXP24S #5887	8246	L2S	EJP3
Specify Mode-2 & (1)ESA1/ESA2 for EXP24S #5887	8246	L2S	EJP6
Specify Mode-2 (2)ESA1/ESA2 for EXP24 #5887	8246	L2S	EJP7
Specify mode-2 (1) ESA1/ESA2 for EXP24 #5887	8246	L2S	EJPA
Specify mode-2 (2)ESA1/ESA2 for EXP24#5887	8246	L2S	EJPB
Specify mode-4 (1)ESA1/ESA2 for EXP24 #5887	8246	L2S	EJPC
Specify mode-4 (2)ESA1/ESA2 for EXP24 #5887	8246	L2S	EJPD
Specify mode-4 (3)ESA1/ESA2 for EXP24 #5887	8246	L2S	EJPE
Specify mode-2 (1)5901/5278 for EXP24 #5887	8246	L2S	EJPJ
Specify mode-2 (2)5901/5278 for EXP24 #5887	8246	L2S	EJPK
Specify mode-4 (1)5901/5278 for EXP24 #5887	8246	L2S	EJPL
Specify mode-4 (2)5901/5278 for EXP24 #5887	8246	L2S	EJPM
Specify mode-4 (3)5901/5278 for EXP24 #5887	8246	L2S	EJPN
Storage Backplane -- 6 SFF Drives/SATA DVD	8246	L2S	EL0R
Storage Backplane -- 3 SFF Drives/SATA DVD/HH Tape	8246	L2S	EL0T
Storage Backplane -- 6 SFF Drives/SATA DVD/RAID/ External SAS Port	8246	L2S	EL0V
Storage Backplane -- 6 SFF Drives/SATA DVD			

PowerLinux	8246	L2S	EL0W
Storage Backplane -- 3 SFF Drives/SATA DVD/HH Tape - PowerLinux	8246	L2S	EL0X
Storage Backplane -- 6 SFF Drives/SATA DVD/RAID/External SAS Port - PowerLinux	8246	L2S	EL0Y
300GB 15K RPM SAS SFF Disk Drive - PowerLinux	8246	L2S	EL0Z
PCIe2 LP 4-port 1GbE Adapter	8246	L2S	EL11
8GB (2x4GB) Memory DIMMs - PowerLinux	8246	L2S	EL15
16GB (2x8GB) Memory DIMMs - PowerLinux	8246	L2S	EL16
32GB (2x168GB) Memory DIMMs - PowerLinux	8246	L2S	EL17
8GB (2x4GB) Memory DIMMs - PowerLinux	8246	L2S	EL1F
16GB (2x8GB) Memory DIMMs - PowerLinux	8246	L2S	EL1G
32GB (2x168GB) Memory DIMMs - PowerLinux	8246	L2S	EL1H
177GB SFF-2 SSD w/ eMLC (AIX/Linux)	8246	L2S	EL1K
387GB SFF-2 SSD for AIX/Linux with eMLC	8246	L2S	EL1L
146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	8246	L2S	EL1M
300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	8246	L2S	EL1N
300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	8246	L2S	EL1P
600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	8246	L2S	EL1Q
EXP24S SFF Gen2-bay Drawer	8246	L2S	EL1S
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	8246	L2S	EL1T
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	8246	L2S	EL1U
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	8246	L2S	EL1V
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	8246	L2S	EL1W
SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure	8246	L2S	EL1X
SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure	8246	L2S	EL1Y
SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure	8246	L2S	EL1Z
SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure	8246	L2S	EL20
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	8246	L2S	EL21
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	8246	L2S	EL22
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	8246	L2S	EL23
SAS YO Cable 15m - HD 3Gb Adapter to Enclosure	8246	L2S	EL24
SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure	8246	L2S	EL25
SAS YO Cable 10m - HD 6Gb Adapter to Enclosure	8246	L2S	EL26
SAS YO Cable 6m - HD 6Gb Adapter to Enclosure	8246	L2S	EL28
SAS YO Cable 3m - HD 6Gb Adapter to Enclosure	8246	L2S	EL29
SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter	8246	L2S	EL2A
SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter	8246	L2S	EL2B
SAS AA Cable 3m - HD 6Gb Adapter to Adapter	8246	L2S	EL2C
SAS AA Cable 6m - HD 6Gb Adapter to Adapter	8246	L2S	EL2D
PCIe2 LP RAID SAS Adapter Dual-port 6Gb	8246	L2S	EL2K
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	8246	L2S	EL2L
PCIe LP 2-Port 1GbE TX Adapter	8246	L2S	EL2M
PowerLinux Base package -- 16-core 3.3 GHz PowerLinux 7R2	8246	L2S	ELB4
PowerLinux Base package -- 16-core 3.55 GHz PowerLinux 7R2	8246	L2S	ELB5
Trial PowerVM Live Partition Mobility	8246	L2S	ELPM
PCIe2 LP 8Gb 4-port Fibre Channel Adapter	8246	L2S	EN0Y
8-core 3.3 GHz POWER7 Processor Module (Zero-priced)	8246	L2S	EPL4
8-core 3.55 GHz POWER7 Processor Module (Zero-priced)	8246	L2S	EPL5
Processor Activation for #EPL4 (Zero-priced)	8246	L2S	EPL9
Processor Activation for #EPL5 (Zero-priced)	8246	L2S	EPLA
387GB SFF-1 SSD for AIX/Linux with eMLC	8246	L2S	ES0A
RDX 320 GB Removable Disk Drive	8246	L2S	EU08

The following are features already announced for the IBM Power Systems 8246 machine type:

Description	Machine type	Model	Feature number
Linux Partition Specify	8246	L2S	0266
V.24/EIA232 6.1m (20-Ft) PCI Cable	8246	L2S	0348
V.35 6.1m (20-Ft) PCI Cable	8246	L2S	0353
X.21 6.1m (20-Ft) PCI Cable	8246	L2S	0359
SSD Placement Indicator - CEC	8246	L2S	0462
19 inch, 1.8 meter high rack	8246	L2S	0551
19 inch, 2.0 meter high rack	8246	L2S	0553
Rack Filler Panel Kit	8246	L2S	0599
SAN Load Source Specify	8246	L2S	0837
US TAA Compliance Indicator	8246	L2S	0983
USB 160 GB Removable Disk Drive	8246	L2S	1106
USB 500 GB Removable Disk Drive	8246	L2S	1107
USB Internal Docking Station for Removable RDX Disk Drive	8246	L2S	1123
Custom Service Specify, Rochester Minn, USA	8246	L2S	1140
177GB SFF-1 SSD w/ eMLC (AIX/Linux)	8246	L2S	1775
177GB SSD Module with eMLC (AIX/Linux)	8246	L2S	1995
PCIe LP RAID & SSD SAS Adapter 3Gb	8246	L2S	2053
Primary OS - Linux	8246	L2S	2147
2M LC-SC 50 Micron Fiber Converter Cable	8246	L2S	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	8246	L2S	2459
3M Asynchronous Terminal/Printer Cable EIA-232	8246	L2S	2934
Asynchronous Cable EIA-232/V.24 3M	8246	L2S	2936
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	8246	L2S	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	8246	L2S	3125
Widescreen LCD Monitor	8246	L2S	3632
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	8246	L2S	3925
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	8246	L2S	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	8246	L2S	3928
System Serial Port Converter Cable	8246	L2S	3930
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	8246	L2S	4242
Extender Cable - USB Keyboards, 1.8M	8246	L2S	4256
VGA to DVI Connection Converter	8246	L2S	4276
Rack Integration Services: BP only	8246	L2S	4648
Rack Integration Services	8246	L2S	4649
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
Rack Indicator- Not Factory Integrated	8246	L2S	4650
Rack Indicator, Rack #1	8246	L2S	4651
Rack Indicator, Rack #2	8246	L2S	4652
Rack Indicator, Rack #3	8246	L2S	4653
Rack Indicator, Rack #4	8246	L2S	4654
Rack Indicator, Rack #5	8246	L2S	4655
Rack Indicator, Rack #6	8246	L2S	4656
Rack Indicator, Rack #7	8246	L2S	4657
Rack Indicator, Rack #8	8246	L2S	4658
Rack Indicator, Rack #9	8246	L2S	4659
Rack Indicator, Rack #10	8246	L2S	4660
Rack Indicator, Rack #11	8246	L2S	4661
Rack Indicator, Rack #12	8246	L2S	4662
Rack Indicator, Rack #13	8246	L2S	4663
Rack Indicator, Rack #14	8246	L2S	4664
Rack Indicator, Rack #15	8246	L2S	4665
Rack Indicator, Rack #16	8246	L2S	4666
Software Preload Required	8246	L2S	5000
PCIe LP POWER GXT145 Graphics Accelerator	8246	L2S	5269
PCIe LP 10Gb FCoE 2-port Adapter	8246	L2S	5270
PCIe LP 4-Port 10/100/1000 Base-TX Ethernet Adapter	8246	L2S	5271
PCIe LP 10GbE CX4 1-port Adapter	8246	L2S	5272
PCIe LP 8Gb 2-Port Fibre Channel Adapter	8246	L2S	5273

PCIe LP 2-Port 1GbE SX Adapter	8246	L2S	5274
PCIe LP 10GbE SR 1-port Adapter	8246	L2S	5275
PCIe LP 4-Port Async EIA-232 Adapter	8246	L2S	5277
PCIe LP 2-Port 1GbE TX Adapter	8246	L2S	5281
PCIe LP 2-Port Async EIA-232 Adapter	8246	L2S	5290
RFID Tags for Servers, Blades, BladeCenters, Racks, and HMCs	8246	L2S	5524
System AC Power Supply, 1725 W	8246	L2S	5603
SATA Slimline DVD-RAM Drive	8246	L2S	5762
Full width Keyboard -- USB, US English, #103P	8246	L2S	5951
Full width Keyboard -- USB, French, #189	8246	L2S	5952
Full width Keyboard -- USB, Italian, #142	8246	L2S	5953
Full width Keyboard -- USB, German/Austrian, #129	8246	L2S	5954
Full width Keyboard -- USB, UK English, #166P	8246	L2S	5955
Full width Keyboard -- USB, Spanish, #172	8246	L2S	5956
Full width Keyboard -- USB, Japanese, #194	8246	L2S	5957
Full width Keyboard -- USB, Brazilian Portuguese, #275	8246	L2S	5958
Full width Keyboard -- USB, Hungarian, #208	8246	L2S	5959
Full width Keyboard -- USB, Korean, #413	8246	L2S	5960
Full width Keyboard -- USB, Chinese, #467	8246	L2S	5961
Full width Keyboard -- USB, French Canadian, #445	8246	L2S	5962
Full width Keyboard -- USB, Belgian/UK, #120	8246	L2S	5964
Full width Keyboard -- USB, Swedish/Finnish, #153	8246	L2S	5965
Full width Keyboard -- USB, Danish, #159	8246	L2S	5966
Full width Keyboard -- USB, Bulgarian, #442	8246	L2S	5967
Full width Keyboard -- USB, Swiss/French/German, #150	8246	L2S	5968
Full width Keyboard -- USB, Norwegian, #155	8246	L2S	5969
Full width Keyboard -- USB, Dutch, #143	8246	L2S	5970
Full width Keyboard -- USB, Portuguese, #163	8246	L2S	5971
Full width Keyboard -- USB, Greek, #319	8246	L2S	5972
Full width Keyboard -- USB, Hebrew, #212	8246	L2S	5973
Full width Keyboard -- USB, Polish, #214	8246	L2S	5974
Full width Keyboard -- USB, Slovakian, #245	8246	L2S	5975
Full width Keyboard -- USB, Czech, #243	8246	L2S	5976
Full width Keyboard -- USB, Turkish, #179	8246	L2S	5977
Full width Keyboard -- USB, LA Spanish, #171	8246	L2S	5978
Full width Keyboard -- USB, Arabic, #253	8246	L2S	5979
Full width Keyboard -- USB, Thai, #191	8246	L2S	5980
Full width Keyboard -- USB, Russian, #443	8246	L2S	5981
Full width Keyboard -- USB, Slovenian, #234	8246	L2S	5982
Full width Keyboard -- USB, US English Euro, #103P	8246	L2S	5983
Opt Front Door for 1.8m Rack	8246	L2S	6068
Opt Front Door for 2.0m Rack	8246	L2S	6069
1.8m Rack Acoustic Doors	8246	L2S	6248
2.0m Rack Acoustic Doors	8246	L2S	6249
1.8m Rack Trim Kit	8246	L2S	6263
2.0m Rack Trim Kit	8246	L2S	6272
Power Cable 4.3m (14-ft), Drawer to IBM PDU, (250V/10A)	8246	L2S	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	8246	L2S	6460
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU, (250V, 15A), U. S.	8246	L2S	6469
Power Cord 1.8m(6-ft), To Wall (125V, 15A)	8246	L2S	6470
Power Cord 2.7m (9-ft), To wall/OEM PDU, (125V, 15A)	8246	L2S	6471
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 16A)	8246	L2S	6472
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 10A)	8246	L2S	6473
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 13A)	8246	L2S	6474
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 16A)	8246	L2S	6475
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 10A)	8246	L2S	6476
Power Cord 2.7m (9-ft), To wall/OEM PDU, (250V, 16A)	8246	L2S	6477
Power Cord 2.7 M(9-foot), To wall/OEM PDU, (250V, 16A)	8246	L2S	6478
Power Cord 2.7m (9-ft), To wall/OEM PDU, (125V,			

15A or 250V, 10A)	8246	L2S	6488
4.3m (14-Ft) 3PH/24A Power Cord	8246	L2S	6489
4.3m (14-Ft) 1PH/48A Pwr Cord	8246	L2S	6491
4.3m (14-Ft) 1PH/48-60A Pwr Cord	8246	L2S	6492
Power Cord 2.7m (9-ft), To Wall/OEM PDU, (250V, 10A)	8246	L2S	6493
Power Cord 2.7m (9-ft), To Wall/OEM PDU, (250V, 10A)	8246	L2S	6494
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8246	L2S	6496
Power Cable - Drawer to IBM PDU, 200-240v/10A	8246	L2S	6577
Optional Rack Security Kit	8246	L2S	6580
Modem Tray for 19-Inch Rack	8246	L2S	6586
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)	8246	L2S	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	8246	L2S	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	8246	L2S	6655
4.3m (14-Ft)1PH/24A Power Cord	8246	L2S	6656
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 15A)	8246	L2S	6659
Power Cord 4.3m (14-ft), Drawer to OEM PDU (125V, 15A)	8246	L2S	6660
Power Cord 3m (10-ft), Drawer to IBM PDU, (250V/10A)	8246	L2S	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	8246	L2S	6669
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	8246	L2S	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	8246	L2S	6672
Power Cord 2.7m (9-ft), To Wall/OEM PDU, (250V, 10A)	8246	L2S	6680
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	8246	L2S	7109
Environmental Monitoring Probe	8246	L2S	7118
Power Distribution Unit	8246	L2S	7188
Ethernet Cable, 15m, Hardware Management Console to System Unit	8246	L2S	7802
Linux Software Preinstall	8246	L2S	8143
Linux Software Preinstall (Business Partners)	8246	L2S	8144
USB Mouse	8246	L2S	8845
Order Routing Indicator- System Plant	8246	L2S	9169
Language Group Specify - US English	8246	L2S	9300
New Red Hat License Core Counter	8246	L2S	9442
New SUSE License Core Counter	8246	L2S	9443
Other Linux License Core Counter	8246	L2S	9445
3rd Party Linux License Core Counter	8246	L2S	9446
VIOS Core Counter	8246	L2S	9447
Month Indicator	8246	L2S	9461
Day Indicator	8246	L2S	9462
Hour Indicator	8246	L2S	9463
Minute Indicator	8246	L2S	9464
Qty Indicator	8246	L2S	9465
Countable Member Indicator	8246	L2S	9466
Language Group Specify - Dutch	8246	L2S	9700
Language Group Specify - French	8246	L2S	9703
Language Group Specify - German	8246	L2S	9704
Language Group Specify - Polish	8246	L2S	9705
Language Group Specify - Norwegian	8246	L2S	9706
Language Group Specify - Portuguese	8246	L2S	9707
Language Group Specify - Spanish	8246	L2S	9708
Language Group Specify - Italian	8246	L2S	9711
Language Group Specify - Canadian French	8246	L2S	9712
Language Group Specify - Japanese	8246	L2S	9714
Language Group Specify - Traditional Chinese (Taiwan)	8246	L2S	9715
Language Group Specify - Korean	8246	L2S	9716
Language Group Specify - Turkish	8246	L2S	9718
Language Group Specify - Hungarian	8246	L2S	9719
Language Group Specify - Slovakian	8246	L2S	9720
Language Group Specify - Russian	8246	L2S	9721

Language Group Specify - Simplified Chinese (PRC)	8246	L2S	9722
Language Group Specify - Czech	8246	L2S	9724
Language Group Specify -- Romanian	8246	L2S	9725
Language Group Specify - Croatian	8246	L2S	9726
Language Group Specify -- Slovenian	8246	L2S	9727
Language Group Specify - Brazilian Portuguese	8246	L2S	9728
Language Group Specify - Thai	8246	L2S	9729
80/160GB DAT160 SAS Tape Drive (3.5") for PowerLinux	8246	L2S	EL01
300GB 10K RPM SFF SAS Disk Drive - PowerLinux	8246	L2S	EL02
146GB 15K RPM SFF SAS Disk Drive - PowerLinux	8246	L2S	EL03
PCIe LP 4Gb 2-Port Fibre Channel Adapter - PowerLinux	8246	L2S	EL09
Memory Riser Card - PowerLinux (Zero-priced)	8246	L2S	EL0A
Memory Riser Card - PowerLinux	8246	L2S	EL0K
600GB 10K RPM SAS SFF Disk Drive - PowerLinux	8246	L2S	EL0P
PCIe LP 2-x4-port SAS Adapter 3Gb - PowerLinux	8246	L2S	EL10
1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper	8246	L2S	EN01
3m (9.8-ft) 10Gb E'Net Cable SFP+ Act Twinax Copper	8246	L2S	EN02
5m (16.4-ft) 10Gb E'Net Cable SFP+ Act Twinax Copper	8246	L2S	EN03
1TB Removable Disk Drive Cartridge	8246	L2S	EU01

Business Partner information

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

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=112-070>

Publications

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

- System overview
- Planning for the system
- Installing and configuring the system
- Working with consoles, terminals, and interfaces
- Managing system resources
- Working with operating systems and software applications
- Troubleshooting, service, and support

You can access the product documentation at

<http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/index.jsp>

Product documentation is also available on DVD (5K5T-7087).

The following information is shipped with the 8246-L2S:

- Power Hardware Information DVD (5K5T-7087)
- Installing the 8246-L2S
- Safety Information

Hardware documentation such as installation instructions, user's information, and service information is available to download or view at

<http://www.ibm.com/systems/support>

Visit the IBM System Support Site, which contains the documentation for the hardware

<http://www.ibm.com/systems/support>

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

<http://publib14.boulder.ibm.com/infocenter/systems>

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<http://www.ibm.com/shop/publications/order>

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, as well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge.

Services

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 visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

Technical information

Specified operating environment

Physical specifications

- Width: 440 mm (19.0 in)
- Depth: 706 mm (27.8 in)
- Height: 89 mm (3.5 in)
- Weight (Maximum configurator): 29.5 kg (65 lb)

Operating environment

- Temperature: (nonoperating) 5° to 45° C (41° to 113° F); recommended temperature (operating) 18° to 27° C (64° to 80° F); allowable operating temperature 5° to 35° C (41° to 95° F)
- Relative humidity: Nonoperating 8% to 80%; recommended 5.5° C (42° F) dew point to 60% RH and 15° C (59° F) dew point
- Maximum dew point: 28° C (84° F) (operating)
- Operating voltage: 200 to 240 V ac
- Operating frequency: 47/63 Hz
- Maximum measured power consumption:
 - 1260 watts (maximum)
- Power factor: 0.98
- Thermal output:
 - 4,300 Btu/hour (maximum)
- Power-source loading
 - 1.286 kVa (maximum configuration)
 - Maximum altitude: 3,050 m (10,000 ft)

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

<http://www-912.ibm.com/see/EnergyEstimator>

Noise level and sound power (Preliminary data)

6.6 bels (Operating and idling)

EMC conformance classification:

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

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

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

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

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

Product safety/Country testing/Certification:

- UL 60950 Underwriters Laboratory, Safety Information
- CSA C22.2 No. 60950-00, Canadian Standards Association

- EN60950 European Norm
- IEC 60950, Edition 1, International Electrotechnical Commission, Safety Information
- Nordic deviations to IEC 60950-1 1st Edition

General requirements:

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

Hardware requirements

PowerLinux 7R2 minimum system configuration

The PowerLinux 7R2 offers 16-core configurations with two processor modules. The PowerLinux 7R2 can contain up to 256 GB of system memory (64 GB maximum per memory riser card).

The PowerLinux 7R2 offers five PCIe x8 Gen2 slots and one PCIe x4 Gen2 Low Profile slot, and three or six SFF HDDs/SDDs and one or two media devices, depending on the storage back-plane selected.

PowerLinux 7R2 initial order must include a minimum of the following items:

- Choose package from:
 - Feature ELB4 indicates a package that includes two 3.3 GHz processor modules (2 x #EPL4) and 16 processor activations (16 x #EPL9).
 - Feature ELB5 indicates a package that includes two 3.55 GHz processor modules (2 x #EPL5) and 16 processor activations (16 x #EPLA).
- A minimum of 64 GB of memory is required with ELB4. A minimum of 32 GB of memory is required with ELB5 Both are expandable to 256 GB.

Choose 32 GB minimum memory for ELB5 and first 32 GB memory for ELB4 from:

- 4 x 8 GB (2 x 4 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL15)
- 2 x 16 GB (2 x 8 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL16)
- 1 x 32 GB (2 x 16 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL17)

Choose additional 32 GB of memory for ELB4 from:

- 8 GB (2 x 4 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL1F)
- 16 GB (2 x 8 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL1G)
- 32 GB (2 x 16 GB) Memory DIMMs, 1066 MHz, DDR3 (#EL1H)

Note: The first two memory features chosen on an initial order are installed in the nonfeaturized memory riser card. When 4 x #EL15 are chosen to meet the minimum memory requirements, 1 x #EL0A must be ordered. Feature number EL0A is not allowed with feature number EL16 or EL17.

- Choose Storage Backplane from:
 - 3 x SFF/SATA DVD bay/Tape bay (#EL0R)
 - 6 x SFF/SATA DVD bay (#EL0T)
 - 6 x SFF/SATA DVD bay with Dual Write Cache RAID, and an external SAS port (#EL0V)
- One 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter (#EL2M)

Note: Takes up one PCIe slot.

- Choose minimum of two HDDs or SSDs from:
 - 177 GB SAS SFF SSD (#1775)

- 600 GB SAS SFF HDD 10,000 RPM (#EL0P)
- 300 GB SAS SFF HDD 15,000 RPM (#EL0Z)
- 146.8 GB SAS SFF HDD 15,000 RPM (#EL03)
- 300 GB SAS SFF HDD 15,000 RPM (#EL02)
- 177 GB SAS 1.8" Solid-State Drive (#1995)
- Feature 1995 requires feature 2053.
- No internal HDD or SSD is required if feature 0837 (Boot from SAN) is selected. In this case, a Fibre Channel or Fibre Channel over Ethernet adapter must also be ordered.
- Two 1725 watt AC Power Supplies (2 x #5603) and two power cords (2 x #6xxx)
- Linux Primary Operating System Indicator (#2147)
- One Language Group, Specify (#9300 or #97xx)

Note: The following features are initial order only and are part of packages ELB4 and ELB5:

EL15	8 GB (2x4 GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM (Zero-priced)
EL16	16 GB (2x8 GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM (Zero-priced)
EL17	32 GB (2x16 GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM (Zero-priced)
EL0R	Storage Backplane -- 3 SFF Drives/SATA DVD/HH Tape (Zero-priced)
EL0T	Storage Backplane -- 6 SFF Drives/SATA DVD (Zero-priced)
EL0V	Storage Backplane -- 6 SFF Drives/SATA DVD/RAID/External SAS Port (Zero-priced)
EL0A	Memory Riser Card (Zero-priced)
EPL4	8-core 3.3 GHz POWER7 Processor Module (Zero-priced)
EPL5	8-core 3.55 GHz POWER7 Processor Module (Zero-priced)
EPL9	Processor Activation for #EPL4 (Zero-priced)
EPLA	Processor Activation for #EPL5 (Zero-priced)

Note: One nonfeaturized memory riser card is included in the base system. Additional memory riser card features (#EL0K) can be ordered on the PowerLinux 7R2.

RAID

There are multiple protection options for HDD/SSD drives in the SAS SFF bays in PowerLinux 7R2 system units or drives in disk-only I/O drawers. Although protecting drives is always recommended, Linux users may choose to leave some or all drives unprotected at their own risk and IBM supports these configurations.

This HDD/SSD drive protection can be provided by Linux software or by the HDD or SSD hardware controllers. Mirroring of drives is provided by Linux software. In addition, Linux supports controllers providing RAID 0, 1, 5, 6, or 10. To further augment HDD/SSD protection, hot spare capability can be used for protected drives. Specific hot spare prerequisites apply.

An integrated SAS HDD/SSD controller is provided in the PowerLinux 7R2 system unit and provides support for JBOD and RAID 0, 1, and 10 for Linux. It is optionally augmented by RAID 5 and RAID 6 capability when storage backplane feature number EL0V is added to the configuration. Other disk/SSD controllers are provided as PCIe SAS adapters are supported. PCI Controllers with and without write cache are supported. RAID 5 and RAID 6 on controllers with write cache are supported.

Linux can use disk drives formatted with 512 byte blocks when being mirrored by the operating system. These disk drives must be reformatted to 528 byte sectors when used in RAID arrays. Although a small percentage of the drive's capacity is lost, additional data protection such as ECC and bad block detection is gained in this

reformatting. For example, a 300 GB disk drive when reformatted provides around 283 GB. IBM Power SSDs are formatted to 528 bytes.

Software requirements

- SUSE Linux Enterprise Server 11 Service Pack 1, or later, with current maintenance updates available from SUSE to enable all planned functionality
- SUSE Linux Enterprise Server 10 Service Pack 4, with current maintenance updates available from SUSE to enable all planned functionality
- Red Hat Enterprise Linux for POWER V6.1, or later
- Red Hat Enterprise Linux for POWER V5.7, or later

Users should also update their systems with the latest Linux for Power service and productivity tools available at

<http://www.ibm.com/support/customercare/sas/f/lopdiags/home.html>

Refer to the IBM Prerequisite website for software requirements for each feature number

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

The requirement that a Linux operating system support agreement be in place with the purchase or renewal of a RHEL license can be met in the following ways:

- Clients who want IBM Support should select IBM Operational Support Services - SupportLine for Linux on Power Systems servers (5771-LNX or 5773-LNX). Clients who select IBM SupportLine should not select the RHEL combined "Subscription and Support" features that IBM offers.
- Clients who want Red Hat support should select one of the RHEL combined Subscription and Support features that IBM offers.

Every RHEL subscription only offering includes IBM Support access to Red Hat technical resources in the event that IBM needs Red Hat's assistance in problem determination and resolution. In order to assure that Red Hat resources are available to assist IBM throughout the hours of support, IBM is providing clients with the appropriate subscription only offering. If clients are purchasing IBM Support with IBM support coverage 24 hours a day, 7 days a week, they must purchase a RHEL Premium Subscription offering. Clients who are purchasing IBM Support without 24 hour access to IBM may purchase a RHEL Standard Subscription offering.

Limitations

System

- Integrated system ports are not supported under Linux when the HMC ports are connected to an HMC. Either the HMC ports or the integrated system ports can be used, but not both.
- The integrated system ports are supported for modem and asynch terminal connections by 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.

Hardware Management Console (HMC) machine code

Notes for IBM Systems Director and VMControl:

- If implementing Dynamic Logical Partitioning:
 - An HMC or IVM is required to manage POWER7 processor-based servers implementing partitioning. Multiple POWER7 processor-based servers can be supported by a single HMC.
 - If an HMC is used to manage any POWER7 processor-based server, the HMC must be a CR3, or later, model rack-mount HMC or C05, or later, deskside HMC.

- When IBM Systems Director is used to manage an HMC or if the HMC manages more than 254 partitions, the HMC should have 3 GB of RAM minimum and be a CR3 model, or later, rack-mount or a C06, or later, desktide. SDMC cannot be managed by Systems Director at this time.
- If installing IBM Systems Director: IBM Systems Director Editions for Power Systems 6.3, or later.

For more details about the supported operating systems for IBM Systems Director Server, Common Agent, and Platform Agent, visit

http://publib.boulder.ibm.com/infocenter/director/pubs/topic/com.ibm.director.plan.helps.doc/fqm0_r_os_supported_by_ibm_director_630.html

- If installing IBM Systems Director VMControl :
 - IBM Systems Director VMControl 2.4, or later, is required.
 - VMControl is included in IBM Systems Director Express Edition.
 - IBM PowerVM is required to run VMControl.
 - VMControl Enterprise Edition requires IBM Systems Director version 6.3, or later. If the product is installed on an older version of IBM Systems Director, you will be prompted to perform an upgrade before accessing full functionality.

If attaching an HMC to a new server or adding function to an existing server that requires a firmware update, the HMC machine code may need to be updated.

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

<https://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html>

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

Boot requirements

- Selection of feature 0837 will indicate boot from SAN.

Processor modules

- Two processor modules are required on an order with four, six, or eight processor cores on each processor module. A minimum/maximum of two processor modules are required on a PowerLinux 7R2 order.
- All processors must be activated.
 - A PowerLinux 7R2 with two 8-core 3.3 GHz processor modules (2 x #EPL4) requires that 16 processor activation codes (16 x #EPL9) be ordered.
 - PowerLinux 7R2 with two 8-core 3.55 GHz processor modules (2 x #EPL5) requires that 16 processor activation codes (16 x #EPLA) be ordered.

Power supply

- Two 1725 watt ac power supplies (2 x #5603) are required.

Redundant fans

- Redundant fans standard

Power cords

Two power cords are required. The PowerLinux 7R2 supports 200-240 V ac power cords.

System memory

A minimum 32 GB of memory is required with 3.55 GHz configuration (ELB5). A system must be ordered with a minimum/maximum of 4 x #EL15, 2 x #EL16, or 1 x #EL17. Maximum memory is 256 GB.

A minimum 64 GB of memory is required with 3.3 GHz configuration (ELB4). A system must be ordered with a minimum/maximum of 4 x #EL15, or 2 x #EL16, or 1 x #EL17 and 32 GB of additional low priced memory from memory features EL1F, EL1G, and EL1H. Maximum memory is 256 GB.

- The base machine contains one nonfeaturized memory riser card with four DIMM sockets. Memory features consume two memory DIMM sockets.
 - The PowerLinux 7R2 offers three optional memory riser card features (3 x #EL0A on initial orders; 3 x EL0K on MES orders) with an additional four DIMM sockets per feature. Maximum system memory is 64 GB without feature EL0A/EL0K and 256 GB with three x feature EL0A/EL0K.
- A system can be ordered with a single memory feature EL17 for configuration ELB5. The second memory feature ordered on the same memory riser card does not have to match the first memory feature. Memory features can be mixed on either memory riser card.
- A minimum of one memory feature must be plugged into each memory riser card. Empty memory riser cards are not allowed.
- There is a performance benefit when all DIMMs on a memory riser card are of the same capacity.
- It is generally recommended that memory be installed evenly across all memory riser cards in the system. Balancing memory across the installed memory riser cards allows memory access in a consistent manner and typically results in the best possible performance for your configuration. However, balancing memory fairly evenly across multiple memory riser cards, compared to balancing memory exactly evenly typically has a very small performance difference.

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

Figure 1. Memory features

Feature	Feature number	Minimum quantity	Maximum quantity
8 GB 1066 MHz (2 x 4 GB RDIMMs) (Zero priced)	EL15	0	4
16 GB 1066 MHz (2 x 8 GB RDIMMs) (Zero priced)	EL16	0	2
32 GB 1066 MHz (2 x 8 GB RDIMMs) (Zero priced)	EL17	0	1
4 GB 1066 MHz (2 x 2 GB RDIMMs) (Reduced price)	EL1E	0	8
8 GB 1066 MHz (2 x 4 GB RDIMMs) (Reduced price)	EL1F	0	8
16 GB 1066 MHz (2 x 8 GB RDIMMs) (Reduced price)	EL1G	0	8
32 GB 1066 MHz (2 x 8 GB RDIMMs)	EL1H	0	8

(Reduced price)

PCI card slots

The PowerLinux 7R2 contains five x8 Gen2 Low Profile slots and one x4 Gen2 PCIe Low Profile slot, which is restricted to the standard Ethernet adapter.

Graphics adapters

- A graphics adapter, keyboard, and mouse are not required in the minimum configuration.
- The maximum number of graphics adapters supported in the PowerLinux 7R2 CEC is four.

I/O adapters

- Feature number EL2M is required in the 8246-L2S minimum configuration and occupies the x4 slot.
- Two GX++ slots are available on the PowerLinux 7R2. The GX++ slot 1 does not share space with the CEC PCIe Low Profile adapter slots. The GX++ slot 2 shares space with the PCIe x4 slot. If a GX++ adapter is plugged into the x4 slot, then the feature EL2M required LAN adapter must occupy one of the five x8 slots, leaving four x8 slots available for other adapters.
- No GX++ adapters are supported.
- Refer to Figure 2 for additional I/O adapter information.

Figure 2. I/O adapter features

I/O adapter	Orderable feature number	Supported feature number	CEC Max qty	Sys Max qty	Size
PCIe LP RAID & SSD SAS A	2053		2	2	LP
PCIe LP POWER GXT145 Graphics Acc	5269		4	4	LP
PCIe LP 10Gb FCoE 2-port Adapter	5270		5	5	LP
PCIe LP 4-Port 10/100/1000 Base-T	5271		5	5	LP
PCIe LP 10GbE CX4 1-port Adapter	5272		5	5	LP
PCIe LP 8Gb 2-Port Fibre Channel	5273		5	5	LP
PCIe LP 2-Port 1GbE SX Adapter	5274		5	5	LP
PCIe LP 10GbE SR 1-port Adapter	5275		5	5	LP
PCIe LP 4-Port Async EIA-232 Adap	5277		5	5	LP
PCIe2 LP 4-port 1/10GbE SFP+	5279		5	5	LP
PCIe2 LP 4-port 1/10GbE SR	5280		5	5	LP
PCIe LP 2-port 1GbE TX	5281		5	5	LP
PCIe2 LP PCIe2 2-port 4X IB QDR	5283		5	5	LP
PCIe2 LP PCIe2 2-port 10GbE SR	5284		5	5	LP
PCIe2 LP PCIe2 2-Port 10GbE SFP	5286		5	5	LP
PCIe LP 2-Port Async EIA 232	5290		2	2	LP
PCIe LP 2-Port 1GbE TX	EL2M		1	1	LP
PCIe LP 4 Gb 2-Port Fibre Channel	EL09		5	5	LP
PCIe LP 2-x4-port SAS Adapter 3Gb	EL10		5	5	LP

Storage devices/Bays

- The PowerLinux 7R2 has a slim media bay that can contain an optional DVD-RAM (#5762 or follow-on) and a tape bay (only available with #EL0T/#EL0X) that can contain a tape drive or removable disk drive.
- Either feature number EL0R, EL0T, or EL0V must be selected.
 - Feature number EL0T/EL0X supports three small form-factor (SFF) disk units, either HDD or SSD, an SATA DVD, and a tape. No split backplane supported. No RAID 5 or 6 support.
 - Feature number EL0R/EL0W supports six SFF disk units, either HDD or SSD, and an SATA DVD. No split backplane supported. No RAID 5 or 6 support.

- Feature number EL0V/EL0Y supports six SFF disk units, either HDD or SSD, and an SATA DVD External SAS port. No split backplane supported. RAID 5 and 6 is supported.
- A valid orderable HDD or SSD is required in a minimum configuration. No HDDs or SSDs are required in the CEC if feature number 0837 is selected.
- A feature EL01 DAT160 80/160 GB tape feature and a feature 1123 USB Internal Docking Station for Removable RDX Disk Drive are mutually exclusive. One or the other can be on the system but not both. A minimum of one x feature 1106 or feature 1107 or feature EU01 must be ordered with each feature 1123 ordered.
- SAS-bay-based 1775 support restrictions:
 - SFF feature 1775 is supported in the PowerLinux 7R2 CEC.
 - SSDs and disk drives (HDDs) are not allowed to mirror each other.

Figure 3. Storage device features

Device	Maximum quantity	Bay	Orderable feature number
DVD-RAM (SATA)	1	Slim	5762
DAT160 80/160 GB Tape	1	Tape	EL01
USB Internal Docking Station for Removable RDX Disk Drive	1	Tape	1123

Device	Maximum quantity	Bay	Orderable feature number
177 GB SAS, SFF, Solid-state	6	SFF 1-6	1775
300 GB 10K, SAS, SFF	6	SFF 1-6	EL02
146.8 GB 15K, SAS, SFF	6	SFF 1-6	EL03
600 GB 10K, SAS, SFF	6	SFF 1-6	EL0P
300 GB 15K, SAS, SFF	6	SFF 1-6	EL0Z
177 GB SAS, SFF, Solid-state	336	336 in 14 x #5887	EL1K
387 GB SAS, SFF, Solid-state	336	336 in 14 x #5887	EL1L
146.8 GB, 15K, SAS, SFF, GEN2	336	336 in 14 x #5887	EL1M
300 GB 10K, SAS, SFF, GEN2	336	336 in 14 x #5887	EL1N
300 GB 15K, SAS, SFF, GEN2	336	336 in 14 x #5887	EL1P
600 GB 10K, SAS, SFF, GEN2	336	336 in 14 x #5887	EL1Q
177 GB 1.8", Solid-state, for #2053	4	2 per #2053	1995

Note: Six disks or solid-state drives maximum can be installed internally.

Planning information

Cable orders

No cables required.

Security, auditability, and control

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

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, visit

<http://www.ibm.com/support/electronic>

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

Three years.

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. 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 effective on its date of installation. 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.

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend the time of your call and is subject to parts availability. 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:

- DASD drive
- DASD Media Backplane
- DVD drive
- Fan Air Baffle
- Fan
- All PCI Adapters
- Memory Riser Card
- Power Supply
- Line/power cord
- Keyboard
- Mouse
- External cables
- Display
- Operator Panel
- TOD battery

- Memory DIMMs
- Processor VRM
- SAS Conduit Cable
- SAS Tape Drive Cables
- USB and SAS Tape Drive
- USB Tape Drive Signal Cable
- Storage Interposer
- SPCN Cable
- Interlock Switch
- RAID Battery
- RAID Package Card
- RAID Battery Card

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 5:00 p.m. local time in order to qualify for next-business-day 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 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.

Warranty service upgrades

During the warranty period, warranty service upgrades provide an enhanced level of on-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of on-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed. See the **Warranty services** section above 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.

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.

The Service level is:

- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average response, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

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, via 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. 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.

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 Service level is:

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

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 may be provided as part of the machine's standard maintenance service except that you may install a CRU yourself or request IBM installation, at no additional charge, under any of the On-site Service levels specified above.

Non-IBM parts service

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

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

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

Warranty service upgrades

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.

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

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 or visiting

http://www.ibm.com/servers/support/machine_warranties/machine_code.html

Machine using LMC Type Model
8246-L2S

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM pSeries technical support website

<http://www-933.ibm.com/support/fixcentral/>

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

Educational allowance

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

The educational allowance is 18% for the products in this announcement.

Prices

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

The following are newly announced features on the specific models of the IBM Power Systems 8246 machine type:

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. Charge	Initial/ Monthly MES/ Both/ Support	RP CSU MES
IBM PowerLinux 7R2						
Linux Partition Specify	L2S					Yes
V.24/EIA232 6.1m (20 Ft) PCI C	L2S	0266			Both	Yes No
V.35 6.1m (20 Ft) PCI Cable	L2S	0348			Both	Yes No
X.21 6.1m (20 Ft) PCI Cable	L2S	0353			Both	Yes No
SSD Placement Indicator CEC	L2S	0359			Both	Yes No
SSD Placement Indicator 5887	L2S	0462			Both	Yes No
19 inch, 1.8 meter high rack	L2S	0465			Both	Yes No
19 inch, 2.0 meter high rack	L2S	0551			MES	Yes No
Rack Filler Panel Kit	L2S	0553			MES	Yes No
Load Source Not in CEC	L2S	0599			Both	Yes No
#5887 Load Source Specify	L2S	0719			Both	Yes No
SAN Load Source Specify	L2S	0728			Both	Yes No
US TAA Compliance Indicator	L2S	0837			Both	Yes No
USB External Docking Station R	L2S	0983			Both	Yes No
USB 160 GB Removable Disk Dr	L2S	1104			Both	Yes No
USB 500 GB Removable Disk Dr	L2S	1106			Both	Yes No
USB Internal Docking Station	L2S	1107			Both	Yes No
Custom Serv. Specify, Roch	L2S	1123			Both	Yes No
177GB SFF-1 SSD w/ eMLC AIX/Li	L2S	1140			Both	Yes No
System port/UPS Conversion Cab	L2S	1775			Both	Yes No
177GB SSD Module with eMLC (AI	L2S	1827			Both	Yes No
PCIe LP RAID SSD SAS Adapter 3	L2S	1995			Both	No No
Primary OS Linux	L2S	2053			Both	Yes No
LC-SC 50 Micron Fiber Conv Cab	L2S	2147			Both	Yes No
	L2S	2456			Both	Yes No

LC-SC 62.5 Mic.Fib.Conv.Cable				
	L2S	2459	Both	Yes No
Asynch.Termin/Print.Cbl	EIA232			
	L2S	2934	Both	Yes No
Asynchronous Cable	EIA 232/V			
	L2S	2936	Both	Yes No
Ser to Ser Port Cab Draw/Draw				
	L2S	3124	Both	Yes No
Serial to Se.Port Cbl Rack 8M				
	L2S	3125	Both	Yes No

NOTE: The monitor or display features are subject to a \$16 Electronic Waste Recycling Fee (15-INCH TO 34-INCH VIDEO DEVICE.)

Widescreen LCD Monitor				
	L2S	3632	Both	Yes No
0.3M Serial Prt Converter Cbl				
	L2S	3925	Both	Yes No
Serial Port Null Mod Cab 3.7M				
	L2S	3927	Both	Yes No
Ser.Port Null Modem Cable,10M				
	L2S	3928	Both	Yes No
System Serial Port Converter C				
	L2S	3930	Both	Yes No
6Foot Extend.Cbl for Displays				
	L2S	4242	Both	Yes No
Extender Cable USB Keybo 1.8M				
	L2S	4256	Both	Yes No
VGA to DVI Connection Converte				
	L2S	4276	Both	Yes No
Rack Integration Services: BP				
	L2S	4648	Initial	N/A No
Rack Integration Services				
	L2S	4649	Initial	N/A No

One and only one rack indicator feature is required on all orders (#4650 to #4666).

No Factory Integration Ind.				
	L2S	4650	Initial	N/A No
Rack Indicator, Rack 1				
	L2S	4651	Initial	N/A No
Rack Indicator, Rack 2				
	L2S	4652	Initial	N/A No
Rack Indicator, Rack 3				
	L2S	4653	Initial	N/A No
Rack Indicator, Rack 4				
	L2S	4654	Initial	N/A No
Rack Indicator, Rack 5				
	L2S	4655	Initial	N/A No
Rack Indicator, Rack 6				
	L2S	4656	Initial	N/A No
Rack Indicator, Rack 7				
	L2S	4657	Initial	N/A No
Rack Indicator, Rack 8				
	L2S	4658	Initial	N/A No
Rack Indicator, Rack 9				
	L2S	4659	Initial	N/A No
Rack Indicator, Rack 10				
	L2S	4660	Initial	N/A No
Rack Indicator, Rack 11				
	L2S	4661	Initial	N/A No
Rack Indicator, Rack 12				
	L2S	4662	Initial	N/A No
Rack Indicator, Rack 13				
	L2S	4663	Initial	N/A No
Rack Indicator, Rack 14				
	L2S	4664	Initial	N/A No
Rack Indicator, Rack 15				
	L2S	4665	Initial	N/A No
Rack Indicator, Rack 16				
	L2S	4666	Initial	N/A No
Software Preload Required				
	L2S	5000	Initial	N/A No
PCIe2 LP 4-port 1GbE Adapter				

PCIe LP POWER GXT145 Graphics	L2S	5260	Both	Yes	No
PCIe LP 10Gb FCoE 2 port Adapt	L2S	5269	Both	Yes	No
PCIe LP 4 Port 10/100/1000 Bas	L2S	5270	Both	Yes	No
PCIe LP 10GbE CX4 1 port Adapt	L2S	5271	Both	Yes	No
PCIe LP 8Gb 2 Port Fibre Chann	L2S	5272	Both	Yes	No
PCIe LP 2 Port 1GbE SX Adapter	L2S	5273	Both	Yes	No
PCIe LP 10GbE SR 1 port Adapt	L2S	5274	Both	Yes	No
PCIe LP 4 Port Async EIA 232 A	L2S	5275	Both	Yes	No
PCIe2 4Port 10GBE&1GBE SFP+ LP	L2S	5277	Both	Yes	No
PCIe2 4-Port 10GbE&1GbE SR LP	L2S	5279	Both	Yes	No
PCIe LP 2-Port 1GbE TX Adapter	L2S	5280	Both	Yes	No
PCIe2 LP 2-Port 4X IB QDR Adap	L2S	5281	Both	Yes	No
PCIe2 LP 2 port 10GbE SR Adapt	L2S	5283	Both	Yes	No
PCIe2 LP 2 Port 10GbE SFP Copp	L2S	5284	Both	Yes	No
PCIe LP 2 Port Async EIA 232 A	L2S	5286	Both	Yes	No
RFID Tags for Servers, Blades	L2S	5290	Both	Yes	No
System AC Power Supply, 1725 W	L2S	5524	Initial	N/A	No
SATA Slimline DVD RAM Drive	L2S	5603	Both	Yes	No
EXP24S SFF Gen2-bay Drawer	L2S	5762	Both	Yes	No
Full width Key USB, US English	L2S	5887	MES	Yes	No
Full width Key USB, French	L2S	5951	Both	Yes	No
Full width Key USB, Italian	L2S	5952	Both	Yes	No
Full width Key USB, German/Aus	L2S	5953	Both	Yes	No
Full width Key USB, UK English	L2S	5954	Both	Yes	No
Full width Key USB, Spanish	L2S	5955	Both	Yes	No
Full width Key USB, Japanese	L2S	5956	Both	Yes	No
Full width Key USB, BrazilianP	L2S	5957	Both	Yes	No
Full width Key USB, Hungarian	L2S	5958	Both	Yes	No
Full width Key USB, Korean	L2S	5959	Both	Yes	No
Full width Key USB, Chinese	L2S	5960	Both	Yes	No
Full width Key USB, French Can	L2S	5961	Both	Yes	No
Full width Key USB, Belgian/UK	L2S	5962	Both	Yes	No
Full width Key USB, Swedish/Fi	L2S	5964	Both	Yes	No
Full width Key USB, Danish	L2S	5965	Both	Yes	No
Full width Key USB, Bulgarian	L2S	5966	Both	Yes	No
Full width Key USB, Swiss/Fr/G	L2S	5967	Both	Yes	No
Full width Key USB, Norwegian	L2S	5968	Both	Yes	No

Full width Key USB, Dutch	L2S	5969	Both	Yes	No
Full width Key USB, Portuguese	L2S	5970	Both	Yes	No
Full width Key USB, Greek	L2S	5971	Both	Yes	No
Full width Key USB, Hebrew	L2S	5972	Both	Yes	No
Full width Key USB, Polish	L2S	5973	Both	Yes	No
Full width Key USB, Slovakian	L2S	5974	Both	Yes	No
Full width Key USB, Czech	L2S	5975	Both	Yes	No
Full width Key USB, Turkish	L2S	5976	Both	Yes	No
Full width Key USB, LA Spanish	L2S	5977	Both	Yes	No
Full width Key USB, Arabic	L2S	5978	Both	Yes	No
Full width Key USB, Thai	L2S	5979	Both	Yes	No
Full width Key USB, Russian	L2S	5980	Both	Yes	No
Full width Key USB, Slovenian	L2S	5981	Both	Yes	No
Full width Key USB, US English	L2S	5982	Both	Yes	No
Opt Front Door for 1.8m Rack	L2S	5983	Both	Yes	No
Opt Front Door for 2.0m Rack	L2S	6068	MES	Yes	No
1.8m Rack Acoustic Doors	L2S	6069	MES	Yes	No
2.0m Rack Acoustic Doors	L2S	6248	MES	Yes	No
1.8m Rack Trim Kit	L2S	6249	MES	Yes	No
2.0m Rack Trim Kit	L2S	6263	MES	Yes	No
Pwr Cbl 14FT, Drwr - IBM PDU	L2S	6272	MES	Yes	No
Pwr Crd (14FT), Drwr - OEM PDU	L2S	6458	Both	Yes	No
Pwr Crd 4.3M, Drw-wall/OEM PDU	L2S	6460	Both	Yes	No
PWR Cord(6foot),To wall	L2S	6469	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6470	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6471	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6472	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6473	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6474	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6475	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6476	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6477	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	L2S	6478	Both	Yes	No
PWR Cord(9foot), (125V,15A)	L2S	6488	Both	Yes	No
4.3m (14 Ft) 3PH/24A Power Cor	L2S	6489	MES	Yes	No
4.3m (14 Ft) 1PH/48A Pwr Cord	L2S	6491	MES	Yes	No
4.3m (14 Ft) 1PH/48 60A Pwr Co	L2S	6492	MES	Yes	No
Pwr Crd 2.7m 9ft wall 250V,10A	L2S				

	L2S	6493		Both	Yes	No
Pwr Crd 2.7m 9ft wall	250V,10A L2S	6494		Both	Yes	No
Pwr Crd 2.7m 9ft wall	250V,10A L2S	6496		Both	Yes	No
Power Cable Drawer to IBM PD	L2S	6577		Both	Yes	No
Optional Rack Security Kit	L2S	6580		MES	Yes	No
Modem Tray for 19-Inch Rack	L2S	6586		MES	Yes	No
Pwr Crd 2.7m 9ft wall	125V,15A L2S	6651		Both	Yes	No
4.3m 1PH/24-30A Pwr Cord	L2S	6654		MES	Yes	No
4.3m 14Ft 1PH/24 30A WR Pwr	L2S	6655		MES	Yes	No
4.3m 14Ft 1PH/24A Power Cord	L2S	6656		MES	Yes	No
Pwr.Cord(9ft),To wall/OEM PDU	L2S	6659		Both	Yes	No
PWR Cord(14ft),Dr.to OEM PDU	L2S	6660		Both	Yes	No
Pwr Cord 3M, Drwr to IBM PDU	L2S	6665		Both	Yes	No
Pwr Crd 4.3M, Drwr - OEM PDU	L2S	6669		Both	Yes	No
Pwr Crd 2.7M, Drwr - IBM PDU	L2S	6671		Both	Yes	No
Pwr Crd 1.5M, Drwr - IBM PDU	L2S	6672		Both	Yes	No
Pwr Crd 2.7M, wall - OEM PDU	L2S	6680		Both	Yes	No
IIntelligent PDU+ 1 EIA Unit	L2S	7109		MES	Yes	No
Environmental Monitoring Probe	L2S	7118		Both	Yes	No
Power Distribution Unit	L2S	7188		MES	Yes	No
Eth Cbl 15M HW Management	L2S	7802		Both	Yes	No
Linux Software Preinstall	L2S	8143		Initial	N/A	No
Linux Software Preinstall BP	L2S	8144		Initial	N/A	No
USB Mouse	L2S	8845		Both	Yes	No
Order Routing Indicator Syste	L2S	9169		Initial	N/A	No
Language Group Spcf-US Eng	L2S	9300	NC	Initial	N/A	No
specify mode-1 & (1)5901/5278	L2S	9359		Both	Yes	No
Specify mode-1 & (2)5901/5278	L2S	9360		Both	Yes	No
Specify mode-2 & (2)5901/5278	L2S	9361		Both	Yes	No
Specify mode-4 & (4)5901/5278	L2S	9365		Both	Yes	No
Specify mode-2 & (4)5901/5278	L2S	9366		Both	Yes	No
Specify mode-1 & CEC SAS port	L2S	9384		Both	Yes	No
New Red Hat Lic Core Counter	L2S	9442	NC	Initial	N/A	No
New SUSE Lic Core Counter	L2S	9443	NC	Initial	N/A	No
Other Linux Lic Core Counter	L2S	9445	NC	Initial	N/A	No
3rd Party Linux Lic Core Cnt	L2S	9446	NC	Initial	N/A	No
VIOS Core Counter	L2S	9447	NC	Initial	N/A	No
Month Indicator						

	L2S	9461		Initial	N/A	No
Day Indicator	L2S	9462		Initial	N/A	No
Hour Indicator	L2S	9463		Initial	N/A	No
Minute Indicator	L2S	9464		Initial	N/A	No
Qty Indicator	L2S	9465		Initial	N/A	No
Countable Member Indicator	L2S	9466		Initial	N/A	No
Language Group Spcf-Dutch	L2S	9700	NC	Initial	N/A	No
Language Group Spcf-French	L2S	9703	NC	Initial	N/A	No
Language Group Spcf-German	L2S	9704	NC	Initial	N/A	No
Language Group Spcf-Polish	L2S	9705	NC	Initial	N/A	No
Lang Group Specify - Norwegian	L2S	9706	NC	Initial	N/A	No
Lang.Group Spcf-Portuguese	L2S	9707	NC	Initial	N/A	No
Language Group Spcf-Spanish	L2S	9708	NC	Initial	N/A	No
Language Group Spcf-Italian	L2S	9711	NC	Initial	N/A	No
Langua Gr Speci Canadian Frenc	L2S	9712	NC	Initial	N/A	No
Language Group Spcf-Japanese	L2S	9714	NC	Initial	N/A	No
Language Group Specify Tr Chin	L2S	9715	NC	Initial	N/A	No
Language Group Spcf-Korean	L2S	9716	NC	Initial	N/A	No
Language Group Spcf-Turkish	L2S	9718	NC	Initial	N/A	No
Language Group Spcf-Hungarian	L2S	9719	NC	Initial	N/A	No
Language Group Spcf-Slovakian	L2S	9720	NC	Initial	N/A	No
Language Group Spcf-Russian	L2S	9721	NC	Initial	N/A	No
Lang Group Spcf Simpl Chinese	L2S	9722	NC	Initial	N/A	No
Language Group Spcf-Czech	L2S	9724	NC	Initial	N/A	No
Language Group Spcf-Romanian	L2S	9725	NC	Initial	N/A	No
Lang Group Specify - Croatian	L2S	9726	NC	Initial	N/A	No
Language Group Spcf-Slovenian	L2S	9727	NC	Initial	N/A	No
Lang Group Specify - Braz Port	L2S	9728	NC	Initial	N/A	No
Lang Group Specify - Thai	L2S	9729	NC	Initial	N/A	No
IBM PowerVM for IBM PowerLinux	L2S	EC22		Both	Yes	No
Mode-1 & (1)ESA1/ESA2 for 5887	L2S	EJP1		Both	Yes	No
Mode-1 & (2)ESA1/ESA2 for 5887	L2S	EJP2		Both	Yes	No
Mode-2 & (2)ESA1/ESA2 for 5887	L2S	EJP3		Both	Yes	No
Mode-2 & (1)ESA1/ESA2 for 5887	L2S	EJP6		Both	Yes	No
Specify Mode-2(2)ESA1/ESA2	L2S	EJP7		Both	Yes	No
Specify mode-2(1) ESA1/ESA2	L2S	EJPA		Both	Yes	No
Specify mode-2 (2) ESA1/ESA2	L2S	EJPB		Both	Yes	No

Specify mode-4 (1)ESA1/ESA2	L2S	EJPC	Both	Yes	No
Specify mode-4(2)ESA1/ESA2	L2S	EJPD	Both	Yes	No
Specify mode-4 (3)ESA1/ESA2	L2S	EJPE	Both	Yes	No
Specify mode-2 (1)5901/5278	L2S	EJPJ	Both	Yes	No
Specify mode-2(2)5901/5278	L2S	EJPK	Both	Yes	No
Specify mode-4 (1)5901/5278	L2S	EJPL	Both	Yes	No
Specify mode-4 (2) 5901/5278	L2S	EJPM	Both	Yes	No
Specify mode-4 (3) 5901/5278	L2S	EJPN	Both	Yes	No
80/160GB Tape - PowerLinux	L2S	EL01	Both	Yes	No
300GB 10K SFF Disk-PowerLinux	L2S	EL02	Both	Yes	No
146GB 15K SFF Disk-PowerLinux	L2S	EL03	Both	Yes	No
4Gb 2-port FCAL - PowerLinux	L2S	EL09	Both	Yes	No
Memory Riser Card(Zero-priced)	L2S	EL0A	Initial	N/A	No
Memory Riser Card - PowerLinux	L2S	EL0K	Both	Yes	No
600GB 10K SFF Disk-PowerLinux	L2S	EL0P	Both	Yes	No
Storage Backplane 6 SFF Dri	L2S	EL0R	Initial	N/A	No
Storage Backplane 3 SFF Dri	L2S	EL0T	Initial	N/A	No
Storage Backplane w/ext SAS	L2S	EL0V	Initial	N/A	No
Backplane 6 SFFs -PowerLinux	L2S	EL0W	MES	Yes	No
Backplane 3 SFFs -PowerLinux	L2S	EL0X	MES	Yes	No
Backplane w/ext SAS-PowerLinux	L2S	EL0Y	MES	Yes	No
300GB 15K SFF Disk-PowerLinux	L2S	EL0Z	Both	Yes	No
2-port SAS adapter -PowerLinux	L2S	EL10	Both	Yes	No
PCIe2 LP 4-port 1GbE Adapter	L2S	EL11	Initial	N/A	No
8GB (2x4GB) Memory-PowerLinux	L2S	EL15	Initial	N/A	No
16GB (2x8GB) Memory-PowerLinux	L2S	EL16	Initial	N/A	No
32GB (2x16GB) Memory-PowerLinu	L2S	EL17	Initial	N/A	No
8GB (2x4GB) Memory-PowerLinux	L2S	EL1F	Both	Yes	No
16GB (2x8GB) Memory-PowerLinux	L2S	EL1G	Both	Yes	No
32GB (2x16GB) Memory-PowerLinux	L2S	EL1H	Both	Yes	No
177GB SFF-2 SSD w/ eMLC AIX/Li	L2S	EL1K	Both	Yes	No
387GB SFF-2 SSD for AIX/Linux	L2S	EL1L	Both	Yes	No
146GB 15k RPM SAS SFF-2 Disk	L2S	EL1M	Both	Yes	No
300GB 10k RPM SAS SFF-2 Disk	L2S	EL1N	Both	Yes	No
300GB 15k RPM SAS SFF-2 Disk	L2S	EL1P	Both	Yes	No
600GB 10k RPM SAS SFF-2 Disk	L2S	EL1Q	Both	Yes	No
EXP24S SFF Gen2-bay Drawer	L2S	EL1S	Initial	N/A	No

SAS Cab(YO) Adapter to SAS1.5M	L2S	EL1T	Both	Yes	No
SAS Cab(YO) Adapter to SAS 15M	L2S	EL1U	Both	Yes	No
SAS Cab(YO) Adapter to SAS 3M	L2S	EL1V	Both	Yes	No
SAS Cab(YO) Adapter to SAS 6M	L2S	EL1W	Both	Yes	No
SAS X Cable 15m - HD 3Gb 2-Ada	L2S	EL1X	Both	Yes	No
SAS X Cable 10m - HD 6Gb 2-Ada	L2S	EL1Y	Both	Yes	No
SAS X Cable 3m - HD 6Gb 2-Adap	L2S	EL1Z	Both	Yes	No
SAS X Cable 6m - HD 6Gb 2-Adap	L2S	EL20	Both	Yes	No
SAS Cbl X Adp SAS Enc1 15M	L2S	EL21	Both	Yes	No
SAS Cable (X) Adapter to SAS E	L2S	EL22	Both	Yes	No
SAS Cbl X Adp SAS Enclosure 6M	L2S	EL23	Both	Yes	No
SAS YO Cable 15m - HD 3Gb Adap	L2S	EL24	Both	Yes	No
SAS YO Cable 1.5m - HD 6Gb Ada	L2S	EL25	Both	Yes	No
SAS YO Cable 10m - HD 6Gb Adap	L2S	EL26	Both	Yes	No
SAS YO Cable 6m - HD 6Gb Adapt	L2S	EL28	Both	Yes	No
SAS YO Cable 3m - HD 6Gb Adapt	L2S	EL29	Both	Yes	No
SAS AA Cbl 0.6m - HD 6Gb Adapt	L2S	EL2A	Both	Yes	No
SAS AA Cable 1.5m - HD 6Gb Ada	L2S	EL2B	Both	Yes	No
SAS AA Cable 3m - HD 6Gb Adapt	L2S	EL2C	Both	Yes	No
SAS AA Cable 6m - HD 6Gb Adapt	L2S	EL2D	Both	Yes	No
PCIe2 LP RAID SAS Adapter 6Gb	L2S	EL2K	Both	Yes	No
SAS Ca(YI) System to SAS 3M	L2S	EL2L	Both	Yes	No
PCIe LP 2-Port 1GbE TX Adapter	L2S	EL2M	Initial	N/A	No
PowerLinux Base - 16c 3.3GHZ	L2S	ELB4	Initial	N/A	No
PowerLinux Base - 16c 3.55GHZ	L2S	ELB5	Initial	N/A	No
Trial Live Partition Mobility	L2S	ELPM	Both	Yes	No
1m 10GbE Cable SFP+ Act Twinax	L2S	EN01	Both	Yes	No
3m 10GbE Cable SFP+ Act Twinax	L2S	EN02	Both	Yes	No
5m 10GbE Cable SFP+ Act Twinax	L2S	EN03	Both	Yes	No
PCIe2 LP 8Gb 4-port Fibre Chan	L2S	EN0Y	Both	Yes	No
8-core 3.3 GHz (Zero-priced)	L2S	EPL4	Initial	N/A	No
8-core 3.55 GHZ (Zero-priced)	L2S	EPL5	Initial	N/A	No
EPL4 Proc Activ (Zero-priced)	L2S	EPL9	Initial	N/A	No
EPL5 Proc Activ (Zero-priced)	L2S	EPLA	Initial	N/A	No
387GB SFF-1 SSD for AIX/Linux	L2S	ES0A	Both	Yes	No
1TB Removable Disk Cartridge	L2S	EU01	Both	Yes	No
RDX 320 GB Removable Disk Driv	L2S	EU08	Both	Yes	No

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Corrections

(Corrected on July 16, 2012)

The At a glance section was revised.

(Corrected on May 10, 2012)

In the Overview section, the product name IBM PowerLinux Solution Edition for SAP Applications was corrected.