IBM PowerLinux 7R1 server

High performance, energy-efficient server for Linux

Highlights

- A high performance, energy efficient, reliable and secure infrastructure, plus application solution in a compact 2U package. With IBM® POWER7+ workload-optimising technologies, the IBM PowerLinux Solutions 7R1 delivers fast transactions

- Optimised for emerging and traditional scale-out Linux® workloads

- Economical foundation for optimised solutions

- Deploy more secure, highly available solutions and services faster.

The way the world works is changing. Consumers want instant answers and ubiquitous access from smart devices. They are having billions of conversations on global social networks. Businesses selling goods and services to these consumers are utilising newly available information and instantaneous communication capabilities to more effectively market. Born-on-the-web companies are delivering massive amounts of information to millions of users. These smart companies have one thing in common – they are exploiting Linux and emerging solutions on scale-out systems to deliver the right services at the right time to the right clients.

Today, organisations of all sizes can participate in the data-centric revolution, even while struggling with rising costs and limited IT resources. The IBM PowerLinux 7R1 server is designed specifically as an economical foundation for emerging and traditional scale-out workloads. IBM PowerLinux workload optimised solutions, each tuned to a specific task, are affordable for businesses of all sizes. With solutions ranging from Virtualised Open Source Infrastructure services to IBM Watson-inspired big data analytics, companies which previously relied on x86-based servers can now enjoy the advantages the Power Architecture has brought to large enterprises (LEs):

- More throughput per server with impressive performance and more efficient virtualisation
- Superb reliability and security
- End-to-end (E2E) system optimisation.

A simpler PowerLinux-based IT environment with fewer servers to manage helps reduce infrastructure costs and frees IT staff to focus on bringing innovative products and services to market faster. Replacing aging x86-based Windows® servers with PowerLinux systems and open source applications can further reduce costs by eliminating high proprietary software licence fees and upgrade charges.

The IBM PowerLinux server and IBM PowerVM for IBM PowerLinux are optimised for Linux, providing more efficient horizontal scaling at price points comparable to traditional Linux servers. The IBM PowerLinux 7R1 server delivers the outstanding performance and workload-optimising capabilities of the POWER7+ processor in a Linux only, dense, 2U rack form factor that is ideal for running multiple application and infrastructure workloads in a virtualised environment. The one-socket, high performance, energy-efficient server supports up to eight POWER7+ cores and a choice of Linux operating systems (OS).

Built on the excellent performance of the POWER7+ processor, the IBM PowerLinux 7R1 server is a one-socket server that supports up to eight POWER7+ cores in a dense, rack-optimised form factor. As a high performance infrastructure or application server, the IBM PowerLinux 7R1 server contains innovative workload-optimising technologies that improve performance based on client computing needs. In addition, it includes **Intelligent Energy** features that help increase performance and optimise energy efficiency, resulting in one of the most cost-efficient solutions

IBM PowerLinux 7R1 rack-mount server

for workload deployments. Furthermore, for added versatility, IBM PowerLinux 7R1 offers two power options: 100V or 240 VAC.

Power is virtualisation without limits

Take advantage of the PowerLinux server's scalability and capacity by leveraging our impressive PowerVM technology to fully utilise the system. PowerVM allows any individual logical partition (LPAR) to access the maximum amount of memory and central processing unit (CPU) cores that are available in the server. PowerVM offers this capability to dynamically adjust system resources to partitions based on workload demands, enabling a dynamic infrastructure that dramatically reduces server sprawl via massive consolidation of applications and servers. In addition, optional components in PowerVM Editions are designed to provide advanced virtualisation technologies, resulting in efficiencies in resource utilisation and cost savings.

Power is the performance that delivers business advantage

The excellent performance of the POWER7+ processor makes it possible for applications to run faster with fewer processors, resulting in lower per-socket software licensing costs. In addition, a single system can now run more applications and reduce the number of required servers – lowering infrastructure costs. The latest model of the IBM PowerLinux 7R1 server adds increased memory capacity, higher performance POWER7+ processors, as well as high bandwidth Generation 2 peripheral component interconnect Express (PCIe) slots to provide even greater performance capabilities. And with the four-core, six-core and eight-core processors, it offers the capability to grow with your business through additional input/output (I/O) and storage capacities via expansion units.

Power is effortlessly balancing workload performance

POWER7+ **Intelligent Threads** technology enables workload optimisation by automatically switching between one, two and four execution threads per processor core in order to optimise application throughput. In addition, **Active Memory Sharing (AMS)** technology enables the sharing of a pool of physical memory among virtual machines (VMs) on a single server, helping to increase memory utilisation and drive down system costs. These workload-optimising capabilities can improve application performance and return on investment (ROI) from the server.

Power is dynamic energy optimisation

IBM Systems Director Active Energy Manager exploits **EnergyScale** technology, enabling **Intelligent Energy** management features, which can dramatically and dynamically conserve power and further improve energy efficiency. These Intelligent Energy features enable the POWER7+ processor to operate at a higher frequency if environmental conditions permit, for increased performance and performance per watt; or alternatively operate at a reduced frequency if user settings permit, for significant energy savings.

Power is availability you can count on

The IBM PowerLinux 7R1 is designed with capabilities to deliver impressive application availability and allow more work to be processed with less operational disruption. Reliability, availability and serviceability (RAS) capabilities include recovery from intermittent errors or failover to redundant components, detection and reporting of failures and impending failures, as well as self-healing hardware that automatically initiates actions to effect error correction, repair or component replacement. In addition, the Processor Instruction Retry feature provides for the continuous monitoring of processor status with the capability to restart a processor if certain errors are detected. If required, workloads are redirected to alternate processors, all without disruption to application execution. And, with the Live Partition Mobility (LPM) feature of PowerVM for PowerLinux, running workloads can be moved between servers to eliminate planned downtime.

The PowerLinux 7R1 implements Light Path diagnostics, which provide an obvious and intuitive means to positively identify failing components. This allows system engineers and administrators to easily and quickly diagnose hardware problems. Hardware failures that may have taken hours to locate and diagnose can now be detected in minutes, avoiding or significantly reducing costly downtime.

Feature	Benefits
Excellent POWER7+ performance	• Access data faster and improve response time • Do more work with fewer servers and benefit from infrastructure cost savings from a reduction in the number of servers and software licences
IBM Systems Director Active Energy Manager with EnergyScale Technology	• Dramatically and dynamically improve energy efficiency and lower energy costs with innovative energy management capabilities • Enables businesses to continue operations when energy is limited
IBM PowerVM for IBM PowerLinux	• Easily add workloads as your business grows • Utilise the full capability of the system to reduce infrastructure costs by consolidating workloads onto the Linux OS • Provides ability to efficiently handle unexpected workload peaks by sharing resources
AMS	• Do more with less memory by dynamically allocating memory to virtualised workloads as required versus inefficient fixed allocations
RAS Features	• Keep applications up and running so you can focus on growing your business
Light Path Diagnostics	• Easily and quickly diagnose hardware problems, reducing service time
Industry standard Linux from Red Hat and SUSE OS support	• Access thousands of applications available from the Linux and open source community, independent software vendors (ISVs) and IBM Software • Take advantage of widely available skills and collaboration across the Linux community • Choice of Linux OS from Red Hat and SUSE

IBM PowerLinux 7R1 at a glance	
Configuration options	Models 8246-L1D, 8246-L1T
POWER7+ processor modules – one per system	Four-core 3.6 GHz or six-core 4.2 GHz or eight-core 4.2 GHz
Sockets	One
Level 2 (L2) cache	256 kilobytes (KB) per core
Level 3 (L3) cache	10 megabytes (MB) per core
Memory	32 gigabytes (GB) to 256 GB of registered dual inline memory module (RDIMM) double data rate-3 (DDR-3) AMS
Solid State Drives (SSD)	Up to six small form factor (SFF) drives
Disk drives	Up to six SFF serial attached SCSI (SAS) drives
Disk capacity	Up to 5.4 terabytes (TB)
Media bays	Slimline for DVD-random access memory (RAM) Half height for tape drive* or removable disk
PCI Adapter slots	Five PCIe 8 times Gen2 low profile

IBM PowerLinux 7R1 at a glance

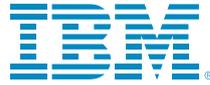| **Standard I/O adapters**	
Standard Ethernet	Four Ethernet 10/100/1000 megabits per second (Mbps) ports
Integrated SAS controller	One controller for SAS DASD/SSD with redundant array of independent disks (RAID) 10 and DVD-RAM Optional protected 175 MB cache with RAID 5, 6
Other integrated ports	Three universal serial buses (USBs), two hardware management consoles (HMCs), two system ports
GX slots	One GX++ (not available with four-core processor)
Expansion features (optional)	
High performance PCI adapters	8 Gigabit (Gb) Fibre Channel (FC) two-port 16 Gb per second (Gbps) FC two-port 10 Gb Ethernet (GbE) RoCE Dual port 10 GbE Dual port 10 Gb FC over Ethernet (FCoE) Dual port quad data rate (QDR) Infiniband 6 Gbps SAS RAID controller
PowerVM technologies	
POWER Hypervisor	Supports multiple VMs (partitions) on a single system; Dynamic partitioning (DPAR); Virtual local area network (vLAN) (memory-to-memory interpartition communication)
PowerVM for PowerLinux	Micro-Partitioning with up to 20 VMs per processor; Multiple Shared Processor Pools; virtualised disk and optical devices (VIOS); Integrated Virtualisation Manager (IVM); Shared Dedicated Capacity; LPM and AMS
RAS features	Error checking and correcting (ECC) memory with Chipkill Processor Instruction Retry Alternate Processor Recovery Service processor with fault monitoring Hot-plug disk bays Hot-plug and redundant power supplies and cooling fans Dynamic component Deallocation
OS†	The following commercial Linux OS releases are supported: Red Hat Enterprise Linux (RHEL) Version 6.4 for POWER or later SUSE Linux Enterprise Server (SLES) 11 SP2 or later
High availability (HA)	IBM Tivoli System Automation for Multiplatform (**ibm.com**/software/tivoli/products/sys-auto-multi) SUSE Linux Enterprise HA Extension (http://www.suse.com/products/highavailability)
Power requirements	100 V to 240 V ac, single phase
System dimensions	Rack Drawer: 3.4 in. H x 17.6 in. W x 28.6 in. D (86 mm x 447 mm x 728 mm); weight 65 lbs (29.5 kg)‡
Warranty (limited)	Three years Limited Warranty, on-site for selected components; Customer replaceable unit (CRU) for all other units (varies by country), Next Business Day 09:00 to 17:00 (excluding holidays), warranty service upgrades and maintenance are available

For more information

To learn more about the IBM PowerLinux 7R1 server and workload optimised solutions, please contact your IBM marketing representative or IBM Business Partner (BP) and visit the following website: **ibm.com**/power/powerlinux

Visit: **ibm.com**/developerworks/group/tpl to join the PowerLinux community for the latest news and technical information.

IBM Maintenance and Technical Support (MTS) solutions can help you get the most out of your IT investment by reducing support costs, increasing availability and simplifying management with integrated support for your multiproduct, multivendor hardware and software environment. For more information on hardware maintenance (HWMA), software support, solution support and managed support, visit: **ibm.com**/services/maintenance

Additionally, IBM Global Financing (IGF) can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. We will partner with credit-qualified clients to customise an IT financing solution to suit your business goals, enable effective cash management and improve your total cost of ownership (TCO). IGF is your smartest choice to fund critical IT investments and propel your business forward. For more information, visit: **ibm.com**/financing/uk

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