

Flagship enterprise server designed as the ideal server consolidation platform



## IBM Power 595 server



Power 595 server

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### Highlights

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- ***For data centers supporting large-scale transaction processing and database applications***
- ***For large-scale server consolidation to increase flexibility and lower operational and energy cost***
- ***For enterprises requiring the highest levels of RAS for their mission-critical applications***

The IBM Power™ 595 server is designed to help enterprises deploy the most cost effective and flexible IT infrastructure while achieving the industry's best application performance and increasing the speed of deployment of new applications and services. As the most powerful member of the IBM Power Systems™ family, this server provides exceptional performance, massive scalability and energy-efficient processing for a full range of complex, mission-critical applications with the most demanding computing requirements.

Equipped with ultra-high frequency IBM POWER6™ processors in up to 64-core, symmetric multiprocessing (SMP) configurations, the Power 595 server can scale rapidly and seamlessly to address the changing needs of today's data center. With advanced PowerVM™ virtualization, EnergyScale™ technology and Capacity on Demand (CoD) options, the the Power 595 helps businesses take control of their IT infrastructure and confidently consolidate multiple UNIX®, IBM i and Linux® application workloads onto a single system.

Extensive mainframe-inspired reliability, availability and serviceability (RAS) features in the Power 595 help ensure that mission-critical applications run reliably around the clock. Clients have the ability to upgrade their POWER5™ 590 or 595 servers and know that their investment in IBM Power Architecture® technology has again been rewarded.



Feature	Benefits
<b>Ultra-high frequency POWER6 processors</b>	<ul style="list-style-type: none"> <li>• Designed to provide excellent application performance</li> <li>• Includes new high reliability features such as Processor Instruction Retry, Alternate Processor Recovery and storage keys</li> <li>• Provides integrated hardware acceleration for Decimal Hardware Floating-Point operations</li> <li>• Improve response time and transaction processing efficiency</li> <li>• Designed with simultaneous multithreading to help increase commercial system performance and processor utilization</li> </ul>
<b>Extensive scalability and configuration options</b>	<ul style="list-style-type: none"> <li>• Deliver data faster for the needs of large-scale transaction processing and memory-intensive applications</li> <li>• Allow growth of existing applications or addition of new applications without adding new servers</li> <li>• High-density 24-inch system frame enables the most efficient, large scale consolidation and maximum growth</li> <li>• Offer flexibility and built-in redundancy so the system can grow with your business</li> </ul>
<b>Mission-critical application availability</b>	<ul style="list-style-type: none"> <li>• Provides 24x7 access to enterprise applications</li> <li>• Increases IT productivity by avoiding costly downtime and recovery</li> <li>• Enables monitoring, detection and resolution of issues without disruption</li> </ul>
<b>PowerVM virtualization</b>	<ul style="list-style-type: none"> <li>• Improves system efficiency to lower operational expense</li> <li>• Provides flexibility to rapidly respond to changing business requirements, including reallocation of system resources without rebooting affected partitions</li> <li>• Provides the ability to transparently share processing power and memory between partitions and to handle unexpected workload peaks by sharing resources</li> <li>• Enables energy savings and maintains application availability</li> </ul>
<b>Flexibility with Capacity on Demand</b>	<ul style="list-style-type: none"> <li>• Allows standby processors and memory to be permanently added to meet long term workload growth</li> <li>• Provides temporary access to additional processors and memory to meet business spikes</li> <li>• Provides prepaid access to processors to meet intermittent or seasonal demands</li> <li>• Offers a one-time 30 day trial to test increased processor or memory capacity before permanent activation</li> </ul>
<b>EnergyScale technology</b>	<ul style="list-style-type: none"> <li>• Helps lower data center energy costs without sacrificing performance or business flexibility</li> <li>• Enables management to understand power and cooling usage and better predict peak requirements</li> </ul>
<b>Multiple operating system support</b>	<ul style="list-style-type: none"> <li>• Provides the flexibility to select the right operating system and the right applications to meet needs</li> <li>• Enables enterprises to consolidate applications onto a more scalable, cost-effective system</li> </ul>

The Power 595 provides a solid foundation on which to consolidate server infrastructure, reduce the complexity of systems administration and optimize computing resources. With extraordinary power, proven IBM technology and expansive growth potential, the Power 595 server is ready to take your business to the next level.

### **POWER6 processors tackle complex workloads**

The Power 595 server features IBM's latest generation of dual-core processor technology, the POWER6 processor—the world's fastest chip, with lightning-fast speeds of 5.0 or 4.2 GHz to deliver truly exceptional performance. These powerful processors make it possible for applications to run faster and be more responsive, processing complex workloads in less time than the previous generations of IBM servers.

POWER6 processors feature simultaneous multithreading, allowing two application "threads" to be run at the same time, which can reduce processing time without increasing system utilization. Hardware Decimal Floating-Point support is designed into the processor, helping to improve the performance of the basic mathematical calculations

of financial transactions on today's business computers. In addition, the processor includes an AltiVec™ SIMD accelerator, which helps to improve the performance of high performance computing workloads.

The Power 595 server uses advanced Multichip Modules (MCMs) to accelerate performance and help ensure system reliability. Each dense MCM contains a dual-core processor chip, 4 MB L2 cache per core and 32 MB L3 cache in an area that could fit in the palm of your hand.

### **Extensive scalability and configuration options**

The Power 595 server is designed to grow with a business by offering outstanding configuration flexibility. Processors, memory, I/O drawers, adapters and disk bays can be easily added to realize the potential power and capacity of the system. The Power 595 server starts with an 8-core configuration and can be scaled to a 64-core system by adding additional processor "books." Each book contains four dual-core MCMs, 32 memory DIMM slots, four I/O ports and two service processors. Dual service processor packaging per book helps improve reliability and availability by reacting to error conditions quickly and effectively.

A Power 595 system can be scaled to 4 TB of memory. Up to three I/O drawers may be installed in the initial system frame, each drawer providing 20 PCIe adapter slots and 26 SAS hot-swap Small Form Factor disk bays. To provide ample room for growth and capacity, expansion frames are available to support up to 29 additional I/O drawers.

### **Mission-critical application availability**

The Power 595 server includes many innovative RAS features as a fundamental part of its design to help keep the system up and running around the clock. The Power 595 extends IBM's world-class RAS capabilities by utilizing hot-plug, hot-swappable and redundant power and cooling components; integrating sophisticated redundant service processors into each processor book; including two system clocks that are both active and support dynamic failover; utilizing IBM Chipkill™ ECC and bit-steering memory that check and correct most memory errors; using First Failure Data Capture mechanisms to log and help prevent the recurrence of intermittent failures that diagnostics cannot reproduce; designing in dynamic de-allocation of system components, including processors and PCI bus slots, to help reallocate resources

when an impending failure is detected so applications can continue to run unimpeded. These functions help to increase system availability and allow more work to be processed with less potential for disruption.

In addition, a new POWER6 capability called Processor Instruction Retry provides for the continuous monitoring of processor status with the capability to restart a processor if certain errors are detected. If required, workloads can be redirected to alternate processors, all without disruption to application execution.

Power 595 logical partitions are designed to be isolated to provide a high level of data security and increased application availability. Dynamic LPAR allows clients to dynamically allocate many system resources to application partitions without rebooting, simplifying overall systems administration and helping to balance workloads and enhance availability. In addition, IBM System Storage™ and PowerHA™ offerings deliver a range of high-availability options, including mirroring in a clustered server environment for near-continuous system availability.

### **PowerVM virtualization**

IBM PowerVM is the family of technologies, capabilities and offerings that deliver industry-leading virtualization. It includes base components provided with Power Systems firmware, and optional components—PowerVM Editions—designed to provide advanced virtualization technologies resulting in efficiencies in resource utilization and cost savings.

PowerVM Standard Edition includes capabilities such as Micro-Partitioning™, Virtual I/O Server, Multiple Shared Processor Pools and Shared Dedicated Capacity, which are designed to allow businesses to increase system utilization, while helping to ensure applications continue to get the resources they need. PowerVM Enterprise Edition includes all the features of Standard Edition plus Live Partition Mobility (LPM) and Active Memory Sharing. Live Partition Mobility allows a partition to be relocated from one server to another with virtually no impact to the applications running inside the partition. LPM is designed to enable servers to work together to help optimize system utilization and energy savings, improve application availability, balance critical workloads and respond

to ever-changing business demands. Active Memory Sharing is an advanced memory virtualization technology which intelligently flows memory from one partition to another for increased utilization and flexibility of memory usage. With this memory virtualization enhancement, partitions can share a pool of memory and have PowerVM automatically allocate the memory based on the partition's workload demands.

### **Flexibility with Capacity on Demand**

Providing additional capacity to a Power 595 system could not be easier: standby processors and memory may be activated in granular increments through Capacity on Demand (CoD) options.

Several types of Capacity on Demand (CoD) are available. Clients can activate processors (in one processor increments) or memory (in one GB increments) on a day-to-day basis (On/Off CoD), a 30-day trial (Trial CoD), or permanently (Capacity Upgrade on Demand (CUoD)). Additionally, Utility CoD allows clients to install processors and activate them on a minute-to-minute basis. The modular architecture of the Power 595 and its support

Capacity on Demand offerings enables enterprises to accommodate growth with a system designed for continuous application availability.

### **EnergyScale technology**

As the price of energy increases and resources become limited, energy efficiency through better utilization has become increasingly vital. Leveraging IBM Power Systems and PowerVM virtualization technologies, corporations around the world have reduced energy consumption by up to 70 – 80%<sup>3</sup>, better managed system growth, and achieved total operating cost reductions of up to 72%<sup>4</sup>.

The Power 595 server delivers an enhanced airflow design and dynamic, deeply integrated power and thermal monitoring. IBM Systems Director Active Energy Manager™ software

exploits EnergyScale technology by monitoring power/thermal utilization and conserving energy through enablement of power management features for improved system utilization and energy efficiency.

### **Support for multiple operating systems**

The Power 595 is designed to manage growth, complexity and risk by giving clients the flexibility to run the AIX®, i, and Linux operating systems concurrently, via logical partitions. AIX, IBM's industrial-strength UNIX environment, is built on a tradition of reliability, availability, security and open standards for business-critical applications.

The IBM i operating system is a highly scalable and virus resistant architecture with a proven reputation for integration, simplicity and exceptional business

resiliency. It integrates a trusted combination of relational database, security, Web services, networking and management capabilities and provides a broad and highly stable database and middle-ware foundation for efficiently deploying business processing applications.

The Red Hat and Novell/SUSE Linux operating systems may be ordered from IBM and select Linux distributors and include many open source applications, tools and utilities. By utilizing the PowerVM Editions feature PowerVM Lx86 running on a Linux for Power distribution, the Power 595 system now offers the flexibility and performance to consolidate x86 servers running a mix of Web, LAMP (Linux, Apache, MySQL and PHP/Perl/Python) and database workloads, helping clients to better manage growth without adding complexity.

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## Power 595 server at a glance

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<b>Processor cores</b>	8- to 64-core POWER6 4.2 or 5.0 GHz via 8-core processor books;
<b>L2 cache</b>	4 MB per core
<b>L3 cache</b>	32 MB per chip
<b>RAM (memory)</b>	16 to 32 DIMMs per processor book Up to 4 TB of 400 MHz DDR2 or Up to 1 TB of 533 MHz DDR2
<b>PCIe I/O drawers</b>	24": 1 – 32
<b>Internal disk bays</b>	26 SAS Small Form Factor bays in each 24" PCIe I/O drawer Up to 832 maximum per system
<b>Adapter slots</b>	20 PCIe in each 24" I/O drawer 640 maximum per system
<b>I/O ports</b>	4 GX adapter ports per processor book, 32 per system
<b>Hardware Management Console ports</b>	Two pairs via redundant Ethernet hubs
<b>POWER Hypervisor™</b>	LPAR, Dynamic LPAR, Virtual LAN
<b>PowerVM Standard Edition (optional)</b>	Micro-Partitioning with up to 10 micro-partitions per processor (254 maximum); Multiple Shared Processor Pools; Virtual I/O Server; Shared Dedicated Capacity; PowerVM Lx86
<b>PowerVM Enterprise Edition<sup>1</sup> (optional)</b>	PowerVM Standard Edition plus Live Partition Mobility and Active Memory Sharing
<b>Capacity on Demand (CoD) configurations</b>	8 to 64 processor cores in increments of one (via one to eight processor books); 4.2 or 5.0 GHz POWER6 processor cores

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## Power 595 server at a glance

### RAS features

Processor Instruction Retry  
Alternate Processor Recovery  
Selective dynamic firmware updates  
IBM Chipkill ECC, bit-steering memory  
ECC L2 cache, L3 cache  
Redundant service processors with automatic failover  
Redundant system clocks with dynamic failover  
Hot-swappable disk bays  
Hot-plug/blind-swap PCI slots  
Hot-add I/O drawers  
Hot-plug power supplies and cooling fans  
Dynamic Processor Deallocation  
Dynamic deallocation of logical partitions and PCI bus slots  
Extended error handling on PCI slots  
Redundant power supplies and cooling fans  
Battery backup and redundant battery backup (optional)

### Capacity on Demand features (optional)

Processor CUoD (in increments of one processor), Memory CUoD (in increments of 1 GB), Reserve CoD, On/Off Processor CoD, On/Off Memory CoD, Trial CoD, Utility CoD

### Operating systems

AIX V5.3 or later  
IBM i 5.4 or later  
SUSE Linux Enterprise Server 10 for POWER™ (SLES10 SP2) or later; Red Hat Enterprise Linux 4.7 for POWER (RHEL 4.7) or later RHEL 5.2 or later

### High availability

PowerHA family

### Power requirements

200v to 240v; 380v to 415v; 480v AC

### System dimensions

One frame (slimline doors): 79.3"H x 30.5"W x 58.5"D (201.4 cm x 77.5 cm x 148.6 cm); weight: 3,376 lb (1,531 kg)<sup>2</sup>; One frame (acoustic doors): 79.3"H x 30.5"W x 71.1"D (201.4 cm x 77.5 cm x 180.6 cm); weight: 3,422 lb (1,552 kg)<sup>2</sup>

### Warranty (limited)

24x7, same day response for one year; on-site (varies by country). Warranty service upgrades and maintenance are available.



## For more information

To learn more about the IBM Power 595 server, please contact your IBM marketing representative or IBM Business Partner, or visit the following Web sites:

- [ibm.com/systems/power/](http://ibm.com/systems/power/)
- [ibm.com/systems/power/software/aix](http://ibm.com/systems/power/software/aix)
- [ibm.com/systems/power/software/i](http://ibm.com/systems/power/software/i)
- [ibm.com/linux/power](http://ibm.com/linux/power)
- [ibm.com/common/ssi](http://ibm.com/common/ssi)

<sup>1</sup> Not supported on IBM i 5.4, 6.1.

<sup>2</sup> Weight will vary when disks, adapters, additional frames, and other peripherals are installed.

<sup>3</sup> Based on joint press release by IBM and PG&E, May 2007 ([ibm.com/press/us/en/pressrelease/21517.wss](http://ibm.com/press/us/en/pressrelease/21517.wss)); Vieth customer case study, April 2007 ([http://www-306.ibm.com/software/success/cssdb.nsf/CS/STRD-72NM7N?OpenDocument&Site=eserverpseries&cty=en\\_us](http://www-306.ibm.com/software/success/cssdb.nsf/CS/STRD-72NM7N?OpenDocument&Site=eserverpseries&cty=en_us)) and Plala Networks, May 2007 ([http://www-306.ibm.com/software/success/cssdb.nsf/CS/CMPN-732N6Q?OpenDocument&Site=eserverpseries&cty=en\\_us](http://www-306.ibm.com/software/success/cssdb.nsf/CS/CMPN-732N6Q?OpenDocument&Site=eserverpseries&cty=en_us))

<sup>4</sup> "Impact of IBM System p Server Virtualization," Transforming the IT Value Equation with POWER6 Architecture. International Technology Group, 05/2007. Study methodology: Companies in financial services, manufacturing and retail with \$15 billion+ revenues focusing on UNIX large enterprise environments with multiple, broad-ranging applications. Study compared the cost of the company's workloads running on multiple vendor servers and employing minimal virtualization to the cost of the company's workloads running on System p® 570 (POWER6 processor-based) as well as POWER5+™ processor-based servers—all using Advanced POWER Virtualization (APV—now known as PowerVM Standard Edition). This cost analysis was performed for financial services, manufacturing and retail example environments with an overall average savings of up to 72% in total operating cost savings by virtualizing and consolidating on the Power Systems servers. Total operating cost may not be reduced in each consolidation case. Total operating cost depends on the specific client environment, the existing environments and staff, and the consolidation potential.

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