

## IBM System p 570 server



p570 modular building blocks

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### Highlights

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- **Advanced IBM POWER6 processor cores for enhanced performance and reliability**
- **Building block architecture delivers flexible scalability and modular growth**
- **Advanced virtualisation features facilitate highly efficient systems utilisation**
- **Enhanced reliability, availability and serviceability (RAS) features enable improved application availability.**

The IBM POWER6 processor-based System p 570 mid-range server delivers outstanding price/performance, mainframe-inspired reliability and availability features, flexible capacity upgrades and innovative virtualisation technologies. This powerful 19-inch rack-mount system, which can handle up to 16 POWER6 cores, can be used for database and application serving, as well as server consolidation. The modular p570 is designed to continue the tradition of its predecessor, the

IBM POWER5+ processor-based System p5 570 server, for resource optimisation, secure and dependable performance and the flexibility to change with business needs. Clients have the ability to upgrade their current p5-570 servers and know that their investment in IBM Power Architecture technology has again been rewarded.

The p570 is the first server designed with POWER6 processors, resulting in performance and price/performance advantages while ushering in a new era in the virtualisation and availability of UNIX® and Linux® data centres. POWER6 processors can run 64-bit applications, while concurrently supporting 32-bit applications to enhance flexibility. They feature simultaneous multi-threading,<sup>1</sup> allowing two application 'threads' to be run at the same time, which can significantly this allows completion of more tasks in any given period of time.

The p570 system is more than an evolution of technology wrapped into a familiar package; it is the result of

'thinking outside the box.' IBM's modular symmetric multi-processor (SMP) architecture means that the system is constructed using 4-core building blocks. This design allows clients to start with what they need and grow by adding additional building blocks, all without disruption to the base system.<sup>2</sup> Optional Capacity on Demand (CoD) features allow the activation of dormant processor power for times as short as one minute<sup>3</sup>. Clients may start small and grow with systems designed for continuous application availability.

### **POWER6 enhancements**

With the introduction of POWER6 processor-based technology to the System p product line, exciting advances in performance, RAS and virtualisation bring new perspectives to the world of IT compute efficiency. A new Integrated Virtual Ethernet adapter comes standard with every system, paving the way to easier virtualisation of high-speed Ethernet connections.

To enhance application availability, a new Processor Instruction Retry feature will automatically monitor the POWER6 processor and if needed, restart the processor workload without disruption to the application. Hot-node add<sup>2</sup> will allow p570 systems to be upgraded with additional building blocks without taking the system down.

In addition, cold-node repair<sup>2</sup> will allow building blocks that have been deactivated due to component failure to be repaired and reintegrated without disruption to the system or applications.

Additional features taking advantage of Power Architecture technology help make system operations more productive. A new Hardware Management Console (HMC) graphical user interface (GUI) offers enhanced systems control. Hardware decimal floating-point support is designed into the POWER6 processor, helping to improve the performance of the basic mathematical calculations of financial transactions that occur daily on today's business computers.

It is anticipated that System p virtualisation will be enhanced with Partition Mobility<sup>2</sup> to be offered as part of the optionally available Advanced POWER Virtualization (APV) feature. This function is designed to move running partitions from one POWER6 server to another with no downtime. POWER6 processor-based systems will be able to work together to help optimise system utilisation, improve application availability, balance critical workloads across multiple systems and respond to ever-changing business demands.

### **Modular building blocks provide increased capacity and easy scalability**

The p570 server is packaged as 4U (EIA units) building block modules (also referred to as nodes) designed for installation in a 19-inch rack. Each module can support up to four POWER6 3.5, 4.2 or 4.7 GHz processor cores along with cache, memory, media, disks, input/output (I/O) adapters, power and cooling to create a balanced, extremely high-performance rack-mount system. Up to four modules can be configured as a single SMP server consisting of up to 16 processor cores, 768 Gigabyte (GB) of Double Data Rate (DDR) 2 buffered memory, four media bays, integrated ports for attaching communications devices, 24 mixed PCI-X and PCI Express adapter slots and 24 internal Serial Attached SCSI (SAS) drives accommodating up to 7.2 Terabyte (TB) of internal disk storage. In addition, up to 32 optional I/O drawers may be attached, significantly adding to the adapter slot and disk storage capacity. A fully configured 16-core p570 server with six optional IBM 7311-D20 I/O drawers may be installed in a single 42U 19-inch rack. This configuration offers 66 adapter slots and 28.8 TB of disk storage in the footprint of a single rack.

Clients can cost-effectively build systems sized specifically for their processing needs by providing the

infrastructure, such as power, room cooling and rack space, to support the number of building blocks and I/O drawers required. As computing demands increase, up to three additional p570 building blocks and multiple I/O drawers can be added to a base system without taking the system down. The p570 system provides tremendous capacity and flexibility for seamless application growth. The building block approach to systems design ensures that as a client grows, the system can easily grow – memory, I/O capacity, processing power and bandwidth. The scalability of p570 building blocks keeps the system in balance.

#### **Virtualisation technologies drive utilisation and improve productivity**

The p570 server can utilise logical partitioning (LPAR) technology implemented via System p virtualisation technologies and the operating system (OS). Logical partitions allow clients to run separate workloads in different partitions on the same server, thereby helping lower costs. p570 partitions are designed to be shielded from each other to provide a high level of data security and increased application availability. The supported OS also implement dynamic LPAR, which allows clients to dynamically allocate many system resources to application

partitions without rebooting, simplifying overall systems administration and workload balancing and enhancing availability.

Optionally available on the p570 server is APV<sup>1</sup> including IBM Micro-Partitioning and Virtual I/O Server (VIOS) capabilities, which are designed to allow businesses to increase system utilisation while helping to ensure applications continue to get the resources they need. Micro-Partitioning technology helps lower costs by allowing the system to be finely tuned to consolidate multiple independent workloads. Micro-partitions can be defined as small as 1/10th of a processor and changed in increments as small as 1/100th of a processor.

VIOS allows the sharing of disk drives as well as communications and Fibre Channel (FC) adapters to help simplify system administration and reduce expenses. A shared processor pool can allow automatic non-disruptive balancing of processing power between partitions assigned to the shared pool – resulting in increased throughput and utilisation. The priority scheme used in managing the pool is designed to instantly allocate the processing power

to the most critical applications to provide consistent service levels for mission-critical applications.

The p570 system must be attached to an HMC, a dedicated system unit that provides the systems administrator an interface for configuring and managing the resources of the server. For redundancy, connection of two HMCs is supported. Among the leading-edge functions controlled using the HMC are virtualisation technologies and CoD. The HMC also provides tools for problem determination and service support. Its use allows server resources to be readjusted dynamically so that companies can respond more readily to changes in requirements. The enhanced graphical user interface of the HMC, along with the integration of capacity planning tools, allows for easier administration and planning of systems growth.

IBM System Storage technology offers additional virtualisation and partitioning capabilities within the storage infrastructure for the p570 server. Storage virtualisation via the IBM SAN Volume Controller (SVC) complements and provides flexibility within the storage backbone allowing clients to move physical devices, create storage pools across multiple devices and provide a central point-of-control.

### **Growth on demand**

Several types of CoD are optionally available on the p570 server to help meet changing resource requirements in an on demand environment by using resources installed on the system but not activated at the time of the original purchase:

- **Capacity Upgrade on Demand (CUoD)** allows clients to purchase additional permanent processor or memory capacity and dynamically activate them when needed
- **On/Off CoD** enables processors or memory to be temporarily activated in full day increments as needed. Charges are based on usage reporting collected monthly
- **Utility CoD** automatically provides additional processor capacity on a temporary basis within the shared processor pool. Usage is measured in processor minute increments and is reported via a Web interface. Billing is based on the reported usage. This capability will be available during the third quarter of 2007
- **Trial CoD** offers a one-time, no additional charge 30-day trial to allow clients to explore the uses of inactive processor and memory capacity on their server.

### **Flexibility and security features**

The System p 570 server is designed to give clients the flexibility to run the AIX 5L and Linux OS concurrently in micro-partitions. The AIX 5L OS, IBM's industrial-strength UNIX environment, is built on a tradition of reliability, availability, security and open standards and is tuned for business-critical applications. It delivers enhancements to Java™ technology, Web performance and scalability for managing systems of all sizes – from single servers to large, complex e-business installations. Web-based remote management tools give administrators centralised control of the system, enabling them to monitor key resources, including adapter and network availability, file system status and processor workload.

The Linux OS is known for its extensive set of available open source applications, the ability to rapidly deploy new or customised solutions and the ability to run on many different platforms from different hardware vendors. Red Hat and Novell/SUSE Linux on POWER may be ordered from IBM and select Linux distributors and include many open source applications, tools and utilities. As a result, Linux on POWER may be less expensive to licence than many proprietary OS. Businesses have a wide choice of IBM and independent software vendor

(ISV) fee-based Linux applications to meet their requirements.<sup>4</sup> IBM is firmly committed to Linux on POWER and has enabled many of the unique Power Architecture technologies into the Linux kernel.

Security is no longer just desirable; it is an absolute requirement. That is why the p570 micro-partition environment is designed to protect security and privacy policies across partition boundaries. Micro-partitions are certified with EAL4 compliance to ensure that virtualisation implementations do not compromise system integrity.

### **RAS features**

The p570 server features mainframe-inspired RAS features that deliver outstanding application availability for mission-critical workloads. Among the world-class RAS capabilities provided are a sophisticated service processor with a second redundant service processor for multiple building block systems;<sup>5</sup> hot-plug, hot-swappable, blind-swap and redundant components; IBM Chipkill error checking and correction (ECC) and bit-steering memory and dynamic deallocation of system components. The resulting increase in system availability allows more work to be processed with less

operational disruption. For enhanced server availability, the p570 can be clustered with IBM High Availability Cluster Multi-processing (HACMP) software designed to provide near continuous availability.

Additional RAS capabilities, Processor Instruction Retry and Concurrent Maintenance<sup>2</sup> (hot-node add and cold-node repair), are designed to enhance application availability and improve the quality of the service provided. Processor Instruction Retry comes standard with all POWER6 processors and 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.

The attachment of additional building block modules to existing p570 systems will not require powering the system down. Planned as a firmware update, the hot-node add<sup>2</sup> capability will be designed to enable clients to grow their systems with additional building blocks without causing disruption to existing users of the system. In certain select cases where the system has deactivated a module due to component failure, a

planned firmware update, cold-node repair,<sup>2</sup> will be designed to enable repair and replacement of components within the inactive module without disruption to existing applications in the system. When the repair is complete, the module can be brought back online and the new resources made immediately available for assignment to new or existing application environments.

### **Complementary offerings**

System p 570 servers can be enhanced by including complementary offerings from IBM and IBM partners. These include IBM System Storage I/O products, Licensed Program Products (LPPs) and Global Services (IGS) consulting and services. A large portfolio of products from ISVs is also supported on the p570 server.

IBM storage products are complemented by a full range of capabilities like advanced copy services, management tools and virtualisation services to help protect data and provide infrastructure flexibility. IBM Storage Area Network (SAN) products and solutions provide integrated SAN solutions with multi-protocol local, campus, metropolitan

and global storage networking. Tape products, network attached storage and a variety of software offerings are also available to meet business and end user requirements.

IBM Tivoli offers a variety of software products to enhance the effectiveness and efficiency of managing the p570 system. These products help ensure maximum system performance and availability and assist clients with functions such as asset management; resource accounting and security, data and information management. Tivoli offers special versions of two products – one monitoring product (IBM Tivoli Monitoring Systems Edition for System p) and one security product (IBM Tivoli Access Manager for System p) – at no additional charge to System p clients. IBM also offers leading database and Web commerce software.

IBM combines these offerings with ISV offerings and services from IGS to help clients tailor their environments with tested integrated solution offerings. With support across the entire System p portfolio, these offerings include recommended configurations to cover a range of user requirements and

guidelines on how to design, set-up, install and deploy an enhanced infrastructure for common IT and industry-specific tasks.

**IBM System p 570: Modular growth, application availability and IT efficiency**

Designing systems for performance is one thing. Delivering revolutionary performance while pushing the boundaries of IT efficiency, flexibility and

application availability is something else. Introduced with the IBM System p 570 server, POWER6 technology changes the way UNIX servers are deployed. No longer is virtualisation confined to a single physical server. With the new Partition Mobility<sup>2</sup> and enhanced RAS functions, IT departments can redistribute workloads to match changing capacity

requirements, consolidate applications from multiple servers and perform upgrades and maintenance, all while keeping applications up and running. All of this occurs while leveraging state-of-the-art hardware and software, in a secure environment, just the way clients want it. With the availability of the System p 570 server, IBM continues to be a leader in advanced computing.

**p570 at a glance**

Standard configurations	Per building block	p570 (maximum)
Processor cores	Two or four 64-bit, 3.5, 4.2 or 4.7 GHz POWER6 processor cores in the first building block; four cores in all others	16 64-bit 3.5, 4.2 or 4.7 GHz POWER6 processor cores
Cache	4 Megabyte (MB) Level 2 (L2) cache per core 32 MB Level 3 (L3) cache shared per two cores	64 MB L2 cache per system 256 MB L3 cache per system
RAM (memory) <sup>7</sup>	<ul style="list-style-type: none"> <li>• 2 GB to 48 GB of 667 MHz buffered DDR2 or</li> <li>• 16 GB to 96 GB of 533 MHz buffered DDR2 or</li> <li>• 32 GB to 192 GB of 400 MHz buffered DDR2</li> </ul>	<ul style="list-style-type: none"> <li>• 16 GB to 192 GB of 667 MHz buffered DDR2 or</li> <li>• 128 GB to 384 GB of 533 MHz buffered DDR2 or</li> <li>• 256 GB to 768 GB of 400 MHz buffered DDR2</li> </ul>
Internal disk bays	Six SAS drives	24 SAS drives
Internal disk storage	Up to 1.8 TB (30.6 TB with optional I/O drawers)	Up to 7.2 TB (79.2 TB with optional I/O drawers)
Media bays (optional)	One hot-plug slimline	Four hot-plug slimline
PCI adapter slots	Four PCI Express 8x slots; Two PCI-X DDR @ 266 MHz. All slots are blind-swap	Sixteen PCI Express 8x slots; Eight PCI-X DDR @ 266 MHz. All slots are blind-swap.

**Standard I/O adapters**

Ethernet	<ul style="list-style-type: none"> <li>• Standard: <ul style="list-style-type: none"> <li>– One dual-port Gigabit Ethernet (GbE) and two system ports or</li> </ul> </li> <li>• Options: <ul style="list-style-type: none"> <li>– One quad-port GbE and one system port or</li> <li>– One dual-port 10 GbE and one system port</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Standard: <ul style="list-style-type: none"> <li>– Four dual-port GbE and two system ports or</li> </ul> </li> <li>• Options: <ul style="list-style-type: none"> <li>– Four quad-port GbE and one system port or</li> <li>– Four dual-port 10 GbE and one system port</li> </ul> </li> </ul>
Integrated disk	One SAS controller	Four SAS controllers
Other ports	Two USB; two HMC; two SPCN	Eight USB; two HMC; eight SPCN

## p570 at a glance

### Expansion features (optional)

I/O expansion	Up to eight I/O drawers (combination of 7311-D11, 7311-D20 and/or 7314-G30) <sup>6</sup>	Up to 20 I/O drawers (7311-D11 and 7311-D20) or up to 32 7314-G30 <sup>6</sup>
Connectivity support	4 Gigabit (Gb) FC; 10 Gbe; 12x GX HCA; Ultra320 SCSI	
GX slots	Two (second slot shares space with one PCI Express 8x slot)	Eight

### System p virtualization technologies

POWER Hypervisor	Dynamic LPAR; Virtual LAN (VLAN) (Memory to memory inter-partition communication) <sup>1</sup>
APV <sup>1</sup> (optional)	Micro-Partitioning; Shared processor pool; VIOS; Partition Mobility <sup>2</sup>

### CoD features (optional)

Processor CUoD  
Memory CUoD  
On/Off Processor CoD  
On/Off Memory CoD  
Utility CoD  
Trial Processor CoD  
Trial Memory CoD

### OS

AIX 5L V5.2 or later  
SUSE Linux Enterprise Server (SLES) 10 SP1 for POWER (SLES 10 SP1) or later  
Red Hat Enterprise Linux (RHEL) 4 Update 5 (RHEL 4.5) or later starting in the third quarter of 2007

### Power requirements

200 v to 240 v AC

### System dimensions

p570 building block: 6.85"H (4U) x 19.0"W x 32.4"D (174 mm x 483 mm x 824 mm);  
weight 140.0 lb (63.6 kg)<sup>76</sup>  
7311-D11 I/O drawer: 6.9"H (4U) x 17.5"W x 28.0"D (175 mm x 445 mm x 711 mm);  
weight 86.0 lb (39.1kg)<sup>76</sup>  
7311-D20 I/O drawer: 7.0"H (4U) x 19.0"W x 24.0"D (178 mm x 482 mm x 610 mm);  
weight 101.0 lb (45.9 kg)<sup>76</sup>  
7314-G30 I/O drawer: 7.0"H (4U) x 17.5"W x 24.0"D (178 mm x 445 mm x 610 mm);  
weight 101.0 lb (45.9 kg)<sup>76</sup>

### Warranty (varies by country)

8 A.M. to 5 P.M., next-business-day for one year (limited) at no additional cost; on-site for selected components; customer replaceable unit (CRU) for all other units (varies by country).  
Warranty service upgrades and maintenance are available.

## For more information

To learn more about the System p 570 server, please contact your IBM representative or IBM Business Partner (BP), or visit the following Web sites:

- [ibm.com/systems/p/](http://ibm.com/systems/p/)
- [ibm.com/servers/aix](http://ibm.com/servers/aix)
- [ibm.com/linux/power](http://ibm.com/linux/power)
- [ibm.com/systems/p/solutions](http://ibm.com/systems/p/solutions)
- [ibm.com/common/ssi](http://ibm.com/common/ssi)



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<sup>1</sup> Not supported on AIX 5L V5.2.

<sup>2</sup> The announcement of this capability is an IBM Statement of General Direction for late 2007. All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.

<sup>3</sup> This capability is planned to be available during the third quarter of 2007.

<sup>4</sup> For a full list of IBM and ISV Linux on POWER applications, visit: [ibm.com/systems/linux/power/apps/all.html](http://ibm.com/systems/linux/power/apps/all.html).

<sup>5</sup> Redundant service processor functions are planned for general availability in late 2007. All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.

<sup>6</sup> Not all configuration options are available. Contact your IBM representative or IBM BP for more information.

<sup>7</sup> Weight will vary when disks, adapters and peripherals are installed.

<sup>8</sup> 400 MHz memory is not available on 3.5 GHz systems.