



IBM @server p5 590 server



Highlights

- ***Provides the power to run mission-critical applications with up to 32 IBM POWER5 processors***
- ***Offers exceptional flexibility by supporting IBM AIX 5L, Linux and i5/OS operating systems***
- ***Built with high-end reliability, availability and serviceability features for an on demand world***

To succeed in an on demand world, enterprises need computer systems with the power to compete in a global marketplace, the reliability to operate around the clock, the agility to react swiftly to changing market conditions and the flexibility to run the applications required to meet their objectives. Businesses should be able to achieve those challenges without adding unnecessary complexity or costs.

The IBM @server® p5 590 server is designed to deliver outstanding performance at a price-point that will transform IT economics. Equipped with advanced 64-bit IBM POWER5™ processors in up to 32-way symmetric multiprocessing (SMP) configurations, this server is built to provide the processing power for a wide range of complex, mission-critical applications with demanding processing requirements—from database services to enterprise resource planning (ERP) and transaction processing.

With advanced IBM Virtualization Engine™ system technologies such as Micro-Partitioning™ technology plus Capacity on Demand (CoD) options, this server can scale rapidly and seamlessly to address changing needs. The p5-590 can execute AIX 5L™, Linux® and i5/OS™ operating systems simultaneously providing the flexibility to run the applications businesses need to achieve their goals. And, extensive mainframe-inspired reliability, availability and serviceability (RAS) features can help ensure that the system will be ready for business, 24 hours a day, 7 days a week.

Fast processors deliver more work in less time

The @server p5 590 features advanced fifth-generation POWER5 microprocessors with 1.65 GHz clock speeds to deliver outstanding performance. With these powerful processors, the p5-590 can do more work in less time than the top of the line IBM @server pSeries® system, the p690.

Built with 64-bit capabilities, POWER5 processors can run 64-bit applications today, while concurrently supporting 32-bit applications to enhance flexibility. The POWER5 processor also features simultaneous multi-threading capabilities, allowing the processor to run two application “threads” at the same time, which can significantly reduce the time to complete tasks. With the p5-590, you have the freedom to choose the operating environment and applications that best fit business needs, and you can have the confidence that this server will be ready to handle future requirements as well.

Innovative server packaging enhances performance and reliability

The p5-590 uses advanced Multichip Modules (MCMs) to accelerate performance and help ensure system reliability. Each dense MCM contains eight microprocessors in an area that could fit in

the palm of your hand. By decreasing the physical distance between processors, MCMs enable faster movement of information and increase reliability.

MCMs are assembled in “books”, each containing two eight-way MCMs. This form of packaging helps to insulate components from physical damage and improve reliability. With up to two books per server, the p5-590 can provide up to 32-way processing, greatly enhancing the performance of the system.

Capacity on Demand offers exceptional scalability

The p5-590 starts with an eight-way entry server configuration, but it can be easily scaled up to a 32-way system. When an organization requires additional processing power—temporarily or permanently, it can activate additional inactive processors (in one processor increments) or memory (in 1GB increments), already installed in the system frame, through the Capacity on Demand (CoD) options. With CoD, you can respond transparently to either temporary spikes in demand or long-term increases in workloads.

Several types of CoD options are available for the p5-590. These options use resources already installed in the system but not activated at the time of the original purchase:

- **Capacity Upgrade on Demand (CUoD)** allows companies to purchase additional permanent processor or memory capacity that can be activated when needed.
- **Trial CoD** offers a one-time, 30-day trial at no additional charge to allow clients to explore the uses of added processor or memory capacity on their server.
- **Reserve CoD** allows companies to purchase processor features in pre-paid blocks of 30 processor days and activate them in full day increments in response to workload demand. They can then deactivate the processors automatically when demand subsides.
- **On/Off CoD** enables processors or memory to be activated in full day increments as needed.
- **Capacity BackUp on Demand** will provide inactive CoD processors activated using On/Off CoD in disaster recovery situations. This function is planned for availability in the first quarter of 2005.¹

¹All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Virtualization and partitioning capabilities help consolidate servers and workloads

Advanced IBM Virtualization Engine system technologies with Micro-Partitioning capabilities bring a new dimension to UNIX® and Linux computing. Using the IBM Virtualization Engine technology (a standard feature for this server), the p5-590 can run multiple operating systems on the same server. Dynamic Micro-Partitioning capabilities enable processors to be subdivided to handle multiple workloads at once. The p5-590 can handle 10 micro-partitions per processor, or up to 254 total per server.

IBM logical partitioning (LPAR) technology enhances the security of applications with Evaluation Assurance Level 4+ (EAL4+) and Controlled Access Protection Profile (CAPP) certification. The system is designed to shield application data running in one partition from data in another partition to provide a high level of data security and increased application availability.

All of these capabilities allow server resources to be readjusted so that companies can respond more readily to changes in requirements. In addition, more services can be consolidated on each server—which can lower licensing costs and reduce the complexity of server management.

The p5-590 delivers configuration options

The p5-590 offers outstanding configuration flexibility so the server can grow with a business. Add processors, memory, I/O drawers, adapters and disk bays to realize the potential power and capacity of the p5-590.

Equipped with 8GB of memory in its basic configuration, the p5-590 can be scaled to 1TB using DDR1 266 MHz memory. From 8GB to 128GB of DDR2 533 MHz memory, useful for high-performance applications, is available. The server features 7.6MB L2 and 144MB L3 caches in each MCM to help stage information more effectively from processor memory to applications. These caches allow the p5-590 to run workloads significantly faster than predecessor servers.

The processor MCMs, L3 cache and memory books are packaged into a 24-inch frame. This frame, which contains 42 EIA units (42U) of rack space, uses a bulk power subsystem with redundant hot-plug bulk power assemblies to provide power for other p5-590 components.

At least one I/O drawer is required with 20 PCI or PCI-X adapter slots and 16 hot-swappable Ultra3 SCSI disk bays for 36.4GB or 73.4GB 15K rpm disk drives. With support for 64-bit adapters and backward compatibility for 32-bit cards, these slots provide investment protection and ample room for growth. Hot-plug/blind-swap slots also allow administrators to insert and remove adapters with the I/O drawer in place, which helps prevent system interruption and improves availability.

Up to four I/O drawers and a primary and redundant optional integrated battery backup feature may be installed in the system frame. For more capacity, an expansion frame is available allowing a maximum of eight I/O drawers. This results in a maximum of 160 PCI-X slots and 128 disk storage bays accommodating up to 9.3TB of disk storage.

The p5-590 can be converted to an IBM **@server** p5 595 server, to provide even greater performance and increased scalability. The p5-595 offers up to 64 processors, 2TB of memory, up to 240 PCI-X slots, up to 192 disk storage bays and up to 14TB of internal disk storage.

RAS features help ensure availability of mission-critical applications

The p5-590 is designed to provide new levels of proven, mainframe-inspired reliability, availability and serviceability for mission-critical applications. It comes equipped with multiple resources to identify and help resolve system problems rapidly. During ongoing operation, error checking and correction (ECC) checks data for errors and can correct them in real time. First Failure Data Capture (FFDC) capabilities log both the source and root cause of problems to help prevent the recurrence of intermittent failures that diagnostics cannot reproduce. Meanwhile, Dynamic Professor Deallocation and dynamic deallocation of PCI bus slots help to reallocate resources when an impending failure is detected so applications can continue to run unimpeded. If problems do arise, a finely grained L2 cache and improved L3 cache line delete capabilities are designed to protect data.

The p5-590 also includes structural elements to help ensure outstanding availability and serviceability. The 24-inch system frame includes hot-swappable disk bays and PCI slots that allow administrators to repair, replace or install components without interrupting

the system. Redundant hot-pluggable power and cooling subsystems provide power and cooling backup in case units fail, and they allow for easy replacement. In the event of a complete power failure, Early Power Off Warning capabilities are designed to perform an orderly shutdown. In addition, both primary and redundant battery backup power subsystems are optionally available.

Future planned capabilities will enhance RAS features.² A redundant service processor will help the available service processor prevent outages and identify failing components by continuously monitoring system operations and taking preventive action for quick problem resolution. Dynamic firmware update capabilities will allow administrators to update servers without taking them offline.

The p5-590 is also backed by worldwide IBM service and support. The one-year end-to-end warranty includes AIX 5L operating system support, hardware fixes, staffed phone hardware support and call tracking.

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The p5-590 provides the flexibility to run needed applications

The p5-590 can run the AIX 5L, Linux and i5/OS operating systems (OS) simultaneously on the same server, giving the flexibility to support an extensive range of applications while also saving money.

AIX 5L is an industrial-strength IBM UNIX environment specially tuned for mission-critical applications and loaded with exceptional security, reliability and availability features. The AIX 5L operating system 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 centralized control of the system, enabling them to monitor key resources, including adapter and network availability, file system status and processor workload.

The AIX 5L OS also incorporates AIX 5L Workload Manager, a resource management tool that specifies the relative importance of workloads to balance the demands of competing workloads and enhance system resources. Workload Manager can help ensure that critical applications remain responsive even during periods of peak system demand.

i5/OS is the next generation of OS/400®, building on and extending the capabilities of that operating system. i5/OS can help streamline processes and deploy business applications faster with its integrated, pre-tested database and middleware. By supporting a comprehensive set of open and SQL standards, i5/OS also allows outstanding flexibility and code portability. Extended data partitioning allows you to perform scheduled maintenance and switch database objects to other systems easily, helping to minimize interruptions to normal operations.

By supporting the Linux OS, the p5-590 offers important cost-saving opportunities. Because Linux is an open source technology, it is much less expensive to license than many proprietary operating systems. With a growing list of Linux applications available, it offers businesses the freedom to use the right applications for their needs.

The Linux OS is available from one or more Linux distributors in packages that include a range of open source tools and applications. With the extensive IBM commitment to Linux, you have access to expert service and support.

The p5-590 helps achieve outstanding performance

With the p5-590 server, you can achieve high-end performance, scalability, reliability and flexibility at an affordable price. Using innovative POWER5 processors in partitions and accessing advanced IBM Virtualization Engine system technologies with Micro-Partitioning capabilities, this server can help complete more transactions, solve larger problems and conduct more complex queries than predecessor servers. It does so with a smaller footprint, allowing you to consolidate your

server infrastructure, reduce the complexity of systems administration and optimize required resources. With the ability to use multiple operating systems simultaneously, you have great flexibility to run a variety of applications. Extensive RAS features are designed to help applications run reliably around the clock.

By accessing these outstanding performance features at exceptional price/performance levels for high-end UNIX servers, you can ease worries about hitting performance ceilings. The p5-590 scales easily, allowing processing power, memory and storage capacity to be added.

IBM @server p5 590 server at a glance

Minimum configuration

Microprocessors	Eight POWER5 1.65GHz processors in a single MCM (16-way system with eight processors inactive)
L2 cache	7.6MB per MCM
L3 cache	144MB per MCM
RAM (memory)	8GB
Disk bays	16 hot-swappable via one I/O drawer
I/O drawers	One
Expansion slots	20 hot-plug/blind-swap PCI-X via one I/O drawer
PCI bus width	32- and 64-bit

Standard features

I/O adapters	Two integrated dual Ultra3 dual SCSI controllers
Ports	Two serial ports for connecting Hardware Management Console

System expansion

SMP configurations	16- or 32-way SMP (two- or four MCMs); 1.65GHz POWER5
RAM	Up to 1TB DDR1 266MHz; up to 128GB DDR2 533MHz
PCI-X expansion slots	Up to 160 adapters via eight I/O drawers
Connectivity support	2 Gigabit Fibre Channel
Disk bay expansion	Up to 128 hot-swappable disk bays via eight I/O drawers; up to 9.3TB of total disk storage (36.4GB and 73.4GB 15K rpm disk drives available)
Logical partitioning support	Dynamic LPAR
IBM Virtualization Engine technology	Micro-Partitioning Shared processor pool Virtual LAN Virtual I/O
Battery backup	Up to two (optional)

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RAS features

Copper, silicon-on-insulator (SOI) microprocessors
Dynamic firmware updates (planned for 1Q2005)
IBM Chipkill™ ECC, bit-steering memory
ECC L2 cache, L3 cache
Service processor
Redundant service processor (planned for 1H2005)
Redundant system clock requiring system reboot
Hot-swappable disk bays
Hot-plug/blind-swap PCI-X slots
Hot-plug power supplies and cooling fans
Dynamic Processor Deallocation
Dynamic deallocation of logical partitions and PCI bus slots
Redundant power supplies and cooling fans
Battery backup and redundant battery backup (optional)

Capacity on Demand features (optional)

Processor CUoD
Memory CUoD*
Reserve CoD
On/Off Processor CoD
On/Off Memory CoD*
Trial CoD
BackUp CoD (planned for 1Q 2005)

Operating systems

AIX 5L Versions 5.2/5.3
i5/OS V5.3
Linux

- SUSE LINUX Enterprise Server 9 for POWER™
- Red Hat Enterprise Linux AS 3 for POWER Update 3

Power requirements

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

System dimensions

One frame: 79.2" H x 30.9" W x 66.2" D (2,025mm x 785mm x 1,681mm)
Weight: 2,887 lb (1,310 kg)**
Two frames: 79.2" H x 62.0" W x 66.2" D (2,025mm x 1,575mm x 1,681mm)
Weight: 4,956 lb (2,248 kg)**

Warranty

24x7, same day service for one year (limited) at no additional cost; on-site for selected components; CRU (customer replaceable units) for all other units (varies by country).

* Using DDR1 266MHz memory

** With acoustic door and integrated battery backup. Weight will vary when disks, adapters and other peripherals are installed.

For more information

To learn more about the IBM **@server** p5 590 server contact your IBM marketing representative or IBM Business Partner, or visit:

- ibm.com/eserver/pseries
- ibm.com/common/ssi



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