



Announce date: October 15, 2004

---

---

## IBM @server p5 Announcement Overview

---

---

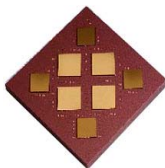
### *IBM @server p5 595 and 590 – POWER5 powerhouses*

Today, IBM introduces two high-end IBM @server® p5 systems that redefine the IT economics of enterprise UNIX® and Linux® computing. The 16- to 64-way @server p5 595 server is the new flagship of the @server p5 product line with almost three times the commercial performance, twice the scalability and double the memory capacity of its predecessor, the IBM @server pSeries® 690<sup>1</sup>. Accompanying the p5-595 is the up to 32-way @server p5 590 that offers enterprise-class function and more performance than the p690 at a significantly lower price for comparable configurations<sup>2</sup>.



Both systems are powered by IBM's most advanced 64-bit Power Architecture™ microprocessor, IBM POWER5™, with simultaneous multi-threading which makes each processor look like two to the operating system, thus increasing commercial performance and system utilization over servers without this capability. The p5-595 features a choice of IBM's fastest POWER5 processors running at 1.9 GHz or 1.65 GHz, while the p5-590 offers 1.65 GHz processors.

#### **POWER5: the “gold standard” in performance**



The power of IBM's most advanced 64-bit microprocessor, POWER5, is clearly demonstrated by the industry-leading commercial and technical computing performance of the p5-595 and p5-590 systems. The 64-way p5-595 more than doubles the performance of the 64-way HP Superdome for Java™ serving<sup>3</sup> and HPC<sup>4</sup> applications. For clients who don't require the maximum scalability of POWER5 computing power, the @server p5 590 excels in running both commercial and technical computing workloads, with 32-way industry leadership in SPECint\_rate2000, SPECfp\_rate2000 and Linpack HPC<sup>5</sup>.

#### **Virtualization – POWER5 at work**

But industry-leading performance is only one part of the p5-590 and p5-595 story. These servers come standard with IBM Virtualization Engine™ systems technologies like dynamic logical partitioning (LPAR), Micro-Partitioning™ and virtual I/O, and offer optional Capacity on Demand (CoD) capability for processors and memory. These breakthrough IBM innovations open the door to vast cost saving consolidation opportunities, providing clients almost unlimited flexibility in configuring their systems and responding quickly and economically to changing business demands.

*IBM @server p5: Make no compromises. Accept no limitations.*

Every @server p5 server includes the **POWER™ Hypervisor™**, which is firmware that helps control partitioning, hardware resource management and Capacity on Demand (CoD) capabilities. The Hypervisor provides dynamic LPAR and virtual LAN, which enables high-speed, secure partition-to-partition communications to help improve performance.

In addition, every p5-590 and p5-595 server comes standard with **Advanced POWER Virtualization**, providing **Micro-Partitioning** to enable system configurations with more partitions than available processors. Processing resources can be allocated in units as small as 1/10<sup>th</sup> of a processor and be fine-tuned in increments of 1/100<sup>th</sup> of a processor. So an @server p5 590 or p5 595 system can support up to ten “virtual servers” per processor (maximum of 254 per system), controlled in a shared processor pool for automatic, non-disruptive resource balancing.

Another capability provided with Advanced POWER Virtualization is the **Virtual I/O Server**, which includes virtual SCSI for sharing Fibre Channel and SCSI adapters and the attached disk drives and virtual networking to enable sharing of Ethernet adapters. The Virtual I/O Server requires APAR IY62262 and is supported by AIX 5L™ V5.3 with APAR IY60349, as well as by SLES 9 and RHEL AS 3. Also included in Advanced POWER Virtualization is **Partition Load Manager**, a powerful policy-based tool for automatically managing resources among LPARs running AIX 5L V5.3 or AIX 5L V5.2 with the 5200-04 Recommended Maintenance package.

To allow clients the flexibility to respond quickly and cost-effectively to both permanent and short-term workload increases, the @server p5 590 and 595 offer **CoD for processors and memory**. Above the minimum configuration starting points, up to half the total number of processors installed may be inactive until needed for growth, at which time they can be permanently or temporarily activated one at a time. For partitions running AIX 5L or SLES 9, clients may utilize the standby power of the inactive processor(s) with four attractive processor CoD functions:

- **Capacity Upgrade on Demand (CUoD)** allows clients to pay for additional permanent processor capacity when required by increased transaction loads, such as new application deployment or server consolidation.
- **Reserve CoD** allows clients to purchase additional processing capacity in prepaid blocks of 30 processor days. The CoD processors are assigned to a shared processor pool and are available immediately<sup>6</sup> to automatically provide additional processing power as workload demands require. Reserve CoD requires AIX 5L V5.3 or SLES 9.
- **On/Off CoD** works like a credit card with quarterly billing, allowing clients to activate and deactivate the CoD processors temporarily as predictable business spikes occur. Clients pay only after resources have actually been used.
- **Trial CoD** gives clients a one-time, no additional charge 30-day trial to allow them to evaluate the use of additional processor capacity and better gauge the amount of standby power they might need in the future.

On the p5-590 and p5-595, memory may also be installed for quick and cost-effective activation as required. The 8GB DDR1 CUoD Memory with 4GB Active and 4GB DDR1 CUoD Memory with 2GB Active features allow clients to activate memory in 1GB increments, using either of three functions:

*IBM @server p5: Make no compromises. Accept no limitations.*

- **Capacity Upgrade on Demand** enables permanent activation of unused memory capacity when required.
- **On/Off CoD** allows clients to activate memory temporarily to meet short-term workload changes.
- **Trial CoD** gives clients a one-time, no additional charge 30-day trial to allow them to evaluate the effect of increased memory capacity on their system operation.

### **Mainframe-inspired RAS**

IBM @server p5 590 and 595 servers provide significant extensions to the mainframe-inspired reliability, availability and serviceability (RAS) capabilities found in @server p5 and pSeries systems. Redundant processor clock cards allow operation to resume by rebooting the system, in the event of a clock card failure, and IBM has stated its intention to make available in 1H 2005 automatic failover capability to a redundant service processor. The p5-590 and p5-595 incorporate redundancy throughout the power subsystem and offer optional redundant battery backup. Other powerful @server p5 RAS functions include dynamic firmware updates<sup>7</sup> to allow most applications to remain operational while IBM system firmware is updated and enhanced self-healing capabilities like finer-grained Level 2 (L2) cache deallocation, improved Level 3 (L3) cache line deletes and ECC (error checking and correction) cache designed to protect data.

### **Flexible operating environment choices**

The core of @server p5 590 and 595 systems is the operating system (OS). Clients have a choice of concurrently running AIX 5L V5.3, AIX 5L V5.2, selected Linux distributions and i5/OS™ V5R3 in separate dynamic LPARs<sup>6</sup> on the same system. Today's announcements also include support for i5/OS V5R3 on the IBM @server p5 570. The ability to consolidate Linux, UNIX and i5/OS workloads on the same system helps simplify administration and migration. And, companies can continue operations with the current release of AIX 5L V5.2 as they prepare to move to the function-rich AIX 5L V5.3, the latest release that supports IBM Virtualization Engine systems technologies and simultaneous multi-threading.

IBM @server p5 590 and 595 systems are supported by the following operating systems<sup>6</sup>:

- AIX 5L V5.2 with the 5200-04 Recommended Maintenance Package (APAR IY56722), or later, plus APAR IY60347
- AIX 5L V5.3 with APAR IY60349, or later
- SUSE LINUX Enterprise Server 9 for POWER (SLES 9), or later
- Red Hat Enterprise Linux AS 3 for POWER (RHEL AS 3) Update 3
- i5/OS V5R3, or later
  - Maximum of two processor licenses on p5-590 and p5-595 and one processor license on p5-570
  - Supported on 1.65 GHz processors only

### **Designed to grow**

p5-590 and p5-595 systems are designed using innovative 16-way units called “books”, each of which contains two 8-way multichip modules (MCMs) with four dual-core POWER5 processor chips. Each chip contains 1.9MB of Level 2 (L2) cache and an integrated memory controller. In addition, the MCM contains 36MB of L3 cache per dual-core processor chip, for a total of 144MB L3. Each book provides 16 memory card slots, allowing 8GB to 512GB of memory per book, and six Remote I/O-2 (RIO-2) cards for attaching I/O drawers. So a p5-590 can scale up to

*IBM @server p5: Make no compromises. Accept no limitations.*

32 processors and 1TB of memory, while the p5-595 goes all the way to a 64-way system and an amazing 2TB of total memory capacity.

Using processor and memory CoD, clients can configure systems poised for rapid response to their changing business needs. Above the minimum requirements of eight active processors for the p5-590 and 16 active for the p5-595, up to 50% of the installed processors may be inactive. For example, an 8-way p5-590 has eight inactive processors available for temporary or permanent scaling, one processor at a time. In the p5-595, at least 16 processors must be active. So, with two processor books installed, a 16-way system has 16 more processors ready to respond to growing workload demands. CoD for memory allows clients the portions of permanent and On/Off activation of 1GB memory increments support additional processors.

Using the RIO-2 ports in the processor books, up to 12 I/O drawers can be attached to an @server p5 595 and up to eight I/O drawers to the @server p5 590, providing up to 9.3TB and 14.0TB of 15K rpm disk storage, respectively. Each 4U (4 EIA unit) drawer provides 20 hot-plug, blind-swap PCI-X I/O adapter slots, 16 front-accessible, hot-swappable disk drive bays and two integrated Ultra3 SCSI controllers. I/O drawers can be installed in the primary 24-inch rack or in an optional expansion rack(s). Attachment to a wide range of IBM TotalStorage® storage system offerings – including disk storage subsystems, storage area network components, tape libraries and external media drives – is also supported. For clients who run the i5/OS operating system, a broad range of compatible I/O options may be ordered using the IBM @server p5 I/O Subsystem for i5/OS (9411-100) for attachment to p5-595, p5-590 and p5-570 servers with 1.65 GHz POWER5 processors.

For clients whose requirements grow beyond the capability of the 32-way p5-590 server, IBM also announces a serial number protected model conversion from the @server p5 590 (9119-590) to @server p5 595 (9119-595). In support of this model conversion, several feature conversions have also been announced.

For system control and service functions, @server p5 590 and 595 systems are attached to an IBM 7310-C03 Desktop or 7310-CR2 Rack-mount Hardware Management Console (HMC) using the integrated Ethernet connections in the Bulk Power Controllers. For redundancy, connection to two HMCs is supported.

### **Scale-out and improve availability with advanced clustering options**

IBM has stated its intention to provide support in 4Q 2004 for the @server p5 595 and 590 within the Cluster 1600 (9078-160) running Cluster Systems Management (CSM) V1.4 for AIX 5L V5.2 and V5.3 and for Linux (SLES 9). For additional protection of critical business applications, two or more IBM @server p5 590 and 595 servers may be configured with proven IBM High Availability Cluster Multiprocessing (HACMP™) V5.2 software<sup>8</sup> to allow automatic failover in the event of system failure.

### **Summary**

Today's announcement of the high-end @server p5 590 and 595 servers completes an unbeatable lineup of fast, flexible, secure @server p5 systems to fit the needs of clients ranging from small and mid-sized businesses to the largest enterprises. The other family members are:

- IBM @server p5 520 and 520 Express – deskside or rack-mount, entry-level 1- and 2-way symmetric multi-processing (SMP) servers

*IBM @server p5: Make no compromises. Accept no limitations.*

- IBM @server p5 550 and 550 Express – up to 4-way deskside or rack-mount SMP servers with additional functionality and capacity for the entry market
- IBM @server p5 570 and 570 Express – rack-mount, mid-range 2- to 16-way SMP systems offering a range of POWER5 processor speeds, scalability and expansion capacity

IBM innovations in processor technology, IBM Virtualization Engine systems technologies, scalability, clustering and autonomic computing put IBM @server p5 systems among the most powerful, versatile, reliable and secure servers in the world. Through leading-edge performance and flexibility, the @server p5 product line can help companies of all sizes simplify their IT infrastructures and safeguard critical data.

Planned availability for IBM @server p5 590 and 595 servers is November 19, 2004, with the following exceptions:

- December 10, 2004, for i5/OS and the IBM @server p5 I/O Subsystem for i5/OS
- February 28, 2005, for Acoustic Doors OEM (FCs 6852 and 6854)
- February 28, 2005, for model conversion from 9119-590 to 9119-595
- April 8, 2005, for 32GB Memory Cards (FCs 7829 and 8198)

#### **IBM Statements of Direction**

IBM intends to offer Capacity BackUp configurations for machine type 9119 for use in disaster recovery scenarios. The systems will be offered with primarily inactive CoD processors and will only support temporary activation of processors using On/Off CoD. The announcement and availability dates are planned for the first quarter of 2005.

IBM plans to extend the capabilities of the IBM @server pSeries High Performance Switch (7045-SW4) with AIX 5L V5.2 by introducing support for the IBM @server p5 595 and 590. This capability is planned to be available in second quarter 2005.

To increase the flexibility of IBM Capacity on Demand offerings and capabilities, IBM intends to make available daily software license entitlements for AIX 5L and selected pSeries Licensed Programs in 4Q 2004. These daily license entitlements will allow clients to purchase license entitlements for only the amount of processor days they need, thereby temporarily expanding the capacity of their existing full licenses of AIX 5L or the selected pSeries License Programs on any available temporary processor.

## *IBM @server p5: Make no compromises. Accept no limitations.*

### Footnotes

1 – Based on @server p5 595 with up to 64 1.9 GHz POWER5 processors, up to 2TB of memory capacity and rPerf of 306.21 vs. pSeries 690 with up to 32 1.9 GHz POWER4+™ processors, up to 1TB of memory capacity and rPerf of 104.17.

2 - Based on @server p5 590 with 32 1.65 GHz POWER5 processors and rPerf of 151.72 at U.S. list price of \$1,420,855 vs. pSeries 690 with 32 1.9 GHz POWER4+ processors and rPerf of 104.17 at U.S. list price of \$2,607,521. Configuration prices effective October 15, 2004.

3 - Based on SPECjbb2000 benchmark result of 2,200,162 operations per second (results submitted to SPEC, awaiting approval) for the 64-way 1.90 GHz POWER5 IBM @server p5-595 versus a 1.5 GHz 64-way HP Superdome result of 1,008,604 operations per second. Source: <http://www.spec.org>.

4 - Based on SPECCompMpeak2001 benchmark result of 92,979 OpenMP performance (results submitted to SPEC, awaiting approval) for 64-way 1.90GHz POWER5 IBM @server p5 595 (running 128 threads) versus a 1.5 GHz 64-way HP Superdome (running 64 threads) result of 42,290 OpenMP performance. Source: <http://www.spec.org>.

5 - For a complete list of all current POWER5 #1 results, go to <http://ibm.com/eserver/benchmarks>

6 - Some IBM @server p5 functions described in this document are operating system dependent and may not be available on Linux distributions.

7 - Dynamic firmware update capability is planned to be available in 1Q05.

8 – HACMP V5 support for IBM @server p5 590 and 595 systems running AIX 5L, when available, will be documented in the IBM Sales Manual. Enter product number 5765-F62 for HACMP V5.



© Copyright IBM Corporation 2004

IBM Corporation  
Marketing Communications  
Systems and Technology Group  
Route 100  
Somers, New York 10589

Produced in the United States of America  
October 2004  
All Rights Reserved

This document was developed for products and/or services offered in the United States. IBM may not offer the products, features, or services discussed in this document in other countries. The information may be subject to change without notice. Consult your local IBM business contact for information on the products, features and services available in your area.

This equipment is subject to FCC rules. It will comply with the appropriate FCC rules before final delivery to the buyer.

IBM hardware products are manufactured from new parts, or new and used parts. Regardless, our warranty terms apply.

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

Information concerning non-IBM products was obtained from the suppliers of these products. Questions on the capabilities of the non-IBM products should be addressed with the suppliers.

All performance information was determined in a controlled environment. Actual results may vary. Performance information is provided "AS IS" and no warranties or guarantees are expressed or implied by IBM.

IBM, the IBM logo, the e-business logo, @server, AIX 5L, IBM Virtualization Engine, HACMP, Hypervisor, i5/OS, Micro-Partitioning, POWER, Power Architecture, POWER4+, POWER5, pSeries and TotalStorage are trademarks or registered trademarks of International Business Machines Corporation in the United States or other countries or both. See <http://www.ibm.com/legal/copytrade.shtml>.

UNIX is a registered trademark of The Open Group in the United States, other countries or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries or both.

Java and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and/or other countries.

SPECjbb and SPEC OMP are trademarks of the Standard Performance Evaluation Corp (SPEC).

Other company, product, and service names may be trademarks or service marks of others.

The IBM home page on the Internet can be found at <http://www.ibm.com>.

The IBM UNIX systems home page on the Internet can be found at <http://www.ibm.com/servers/eserver/pseries>.

More information about IBM @server Cluster 1600 can be found at <http://www.ibm.com/servers/eserver/clusters/>.