

IBM @server pSeries 680



IBM @server pSeries 680 high-end server

Highlights

- **Powered by advanced IBM copper and SOI chips to run complex e-business applications and to meet future growth and application needs**
- **Offers availability and reliability to succeed in today's 24x7 global environment**
- **Provides valuable offerings for support, financing and on-demand growth**

Growth as needed

Today's pace of business transformation requires an enterprise server that offers the flexibility and power needed to quickly adapt to change. The IBM @server pSeries™ 680 is a powerful UNIX® symmetric multiprocessor (SMP) system. It excels at many diverse e-business applications, including Web serving and hosting, mission-critical enterprise resource planning, supply chain management and data warehousing support.

The new standard

The pSeries 680 is part of the IBM @server product line — advanced servers that can help lower costs, improve efficiency and speed e-business transformation. With 4 to 24 microprocessors, each with 16MB of ECC (error checking and correcting), Level 2 (L2) cache, the pSeries 680 has the power, capacity and reliability for the most demanding e-business applications. For customers with lower performance needs, 6 to 24 450 MHz processor options are available.

The pSeries 680 is the first UNIX platform to feature RS64 IV microprocessors, based on state-of-the-art copper, silicon-on-insulator (SOI) technology from IBM. It delivers lots of power for business applications with a total aggregate internal bandwidth of 43.2GB/sec for enhanced throughput.

Rapid growth

The pSeries 680 (p680) provides the scalability necessary to handle business growth smoothly, and extend business-critical applications to the Web. Processors, cache and memory are packaged in “books” to protect the sensitive electronics with four or six processors.¹ As demands on the system grow, up to three additional processor books—each with six processors—can simply be added and plugged into the system as required. The combination of the p680 system and AIX® operating system helps companies to easily handle unexpected peaks in demand. The Workload Manager function of AIX automatically allocates system resources based on customer-established priorities. This allows critical applications to remain responsive, even if multiple applications are running on a single pSeries 680.

The Capacity Upgrade on Demand feature enables businesses to scale the system very quickly to handle requirements for more computing resources. For a fee, one or more additional processor books may be installed, but initially disabled.

When the need for additional capacity arises, an AIX command activates as many additional processors as required in increments of two. Workload Manager ensures that system resources are allocated to accommodate the newly activated processors. Capacity planning is easier to implement with granular growth options (i.e. 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 processors).

Protecting assets

The pSeries 680 helps leverage and protect current information assets. For example, businesses can manage the evolution of an e-business into 64-bit computing while continuing to support existing 32-bit applications. Hardware can also be upgraded independently of application software, ensuring business continuity.

The pSeries 680 packaging offers exceptional configuration flexibility to meet growth needs, while protecting hardware investments. Packaged in two side-by-side rack units, one houses the processors and memory; the other contains one to four 19-inch I/O drawers. The first drawer includes a high-performance 18.2GB Ultra

SCSI internal disk drive, CD-ROM, 1.44MB 3.5-inch diskette drive, two Ultra SCSI PCI adapters, a service processor plus 11 available PCI slots, one available media bay and 11 available hot-swappable disk drive bays. Each additional drawer adds 14 PCI slots, two media bays and 12 hot-swappable disk drive bays. IBM 7014 Model T00 or T42 racks may be used for additional storage and communication capability.

A fully configured pSeries 680 system has 24 600 MHz processors with 96GB of system memory, 56 PCI adapter slots (three of which are reserved for the service processor plus the two required Ultra SCSI adapters), 48 hot-swappable disk bays and eight media bays, one of which is reserved for the CD-ROM drive. This is enough capacity for many demanding applications.

Feature	Benefits
600 MHz RS64 IV microprocessors	<ul style="list-style-type: none"> •Greatly expand performance levels for SMP commercial applications •Provide capacity to grow to 24 processors
Copper and SOI technology²	<ul style="list-style-type: none"> •Provide significant performance increases over non-copper technologies •Offer improved reliability over processors without copper while reducing the heat produced
16MB ECC L2 cache per processor	<ul style="list-style-type: none"> •Provides increased performance and greater reliability
Up to 96GB ECC Chipkill™ memory	<ul style="list-style-type: none"> •Allows exploitation of 64-bit addressing for large database applications •Provides growth options with much greater throughput •Significantly lowers number of memory failures that cause system outages; thus increasing system availability
64-bit system architecture	<ul style="list-style-type: none"> •Improves physical memory use for applications requiring faster access to large amounts of data
Up to 56 PCI adapter slots	<ul style="list-style-type: none"> •Provide growth options for significantly increased capacity •Support many commonly used adapters for increased availability at lower cost
Hot-swappable disk drive bays	<ul style="list-style-type: none"> •Provide greater system availability and smooth growth by allowing swapping or adding of disk drives without powering down the system
Redundant hot-plug power and cooling subsystems	<ul style="list-style-type: none"> •Enhance system availability since cooling fans or power supplies can be changed without interrupting operations
Built-in service processor	<ul style="list-style-type: none"> •Continuously monitors system operations and takes preventive or corrective actions for quick problem resolution and high system availability •Allows diagnostics and maintenance to be performed remotely
Dynamic Processor Deallocation	<ul style="list-style-type: none"> •Automatically deallocates resources when impending processor failures are detected so applications can continue to run uninterrupted
Concurrent 32- and 64-bit application support	<ul style="list-style-type: none"> •Allows customers to migrate to 64-bit applications at their own pace •Protects customers' 32-bit software investments while allowing them to participate in technology enhancements
Capacity Upgrade on Demand	<ul style="list-style-type: none"> •Provides a cost-effective growth path in processing capacity •Satisfies new, unanticipated user application demand rapidly
SP™ Switch attachment	<ul style="list-style-type: none"> •Allows attachment to a high-speed SP Switch providing consolidation and operational advantages in a cluster environment
Cluster 1600	<ul style="list-style-type: none"> •Provides centralized management of multiple systems •Provides ability to handle unexpected workload peaks by sharing resources •Allows for more granular growth so user demands can be readily satisfied
AIX operating system	<ul style="list-style-type: none"> •Supports full interoperability and coexistence between 32- and 64-bit applications with processes that may run concurrently or cooperatively •UNIX 98 technology-compliant and first to achieve UNIX 98 Server registration •Provides an AIX binary compatible environment that helps assure continuing application availability across AIX releases when binary compatibility rules are observed

Availability when you need it

At the heart of the pSeries 680 is an integrated service processor—a computer within a computer—that constantly monitors the system's vital signs. Often, it can determine and recommend actions before a problem arises. If desired, a service call may be automatically placed. Other standard availability functions to help speed system recovery and optimize system availability include: service processor error collection, online concurrent diagnostics, auto restart and remote maintenance and diagnostics.

To maximize system availability, the pSeries 680 server has built-in fault and error correction functions. For main memory, Chipkill memory technology—developed by IBM for the S/390® mainframe server—detects multiple bit errors and corrects most of them transparently. If the error rate exceeds the critical threshold, a maintenance action is initiated automatically by the system, to be resolved at the customer's convenience. IBM studies indicate that systems with Chipkill memory are up to 100 times less likely to experience an outage due to memory failure.³

A unique feature, Dynamic Processor Deallocation, monitors the processors themselves. In the event a processor indicates an impending failure, this feature (working with AIX) is designed to take the faulty processor offline. Work from the failing processor is reassigned automatically to other processors, and replacement of the failing processor can be scheduled during normal service to minimize system and application downtime.

Redundant, hot-plug cooling fans and power supplies further enhance reliability and availability by providing backup capability in the event a fan or power supply becomes disabled. Additionally, failing fans or power supplies may be replaced without affecting system operations.

For near-continuous availability, two pSeries 680 servers can be clustered using High Availability Cluster Multiprocessing (HACMP) software, UNIX disaster recovery software from IBM. The clustering solution minimizes downtime of systems and applications for both planned and unplanned outages and provides a superior base for high availability, an essential ingredient of business-critical environments.

Better management

To help organizations deal effectively with increased complexity, IBM announced Project eLiza™—a blueprint for self-managing systems. Its goal is to create an intelligent IT infrastructure that responds to unexpected capacity demands or to system failures. By using technology to minimize human intervention, businesses can react faster to changing circumstances while at the same time controlling spiraling pressure on critical skills, software and service/support costs.

The pSeries 680 incorporates many leading self-managing system capabilities from across the IBM @server product line. Examples include the service processor, Dynamic Processor Deallocation and Chipkill memory.

Clustering alternatives

Clustering enables multiple servers to be interconnected into a single computing resource for improved availability, scalability, manageability and performance. With the IBM @server Cluster 1600 and AIX, companies can mix or match up to 128 nodes and servers (512 via special order) including up to 16 pSeries 680 systems.

pSeries 680 at a glance

Minimum configuration

Microprocessor:	Six-way 450 MHz RS64 III or four- or six-way 600 MHz RS64 IV
RAM (memory):	4GB (Chipkill)
Level 1 (L1) cache:	128KB data/128KB instruction
Memory slots:	16
Level 2 (L2) cache:	8MB (450 MHz) or 16MB (600 MHz) per processor
Memory bus width:	Quad 512-bit
PCI bus width:	32- and 64-bit
Expansion slots:	14 PCI (11 available)
Media bays:	Two (one available)
Disk drive bays:	12 (11 available)
Internal disk drive:	18.2GB Ultra SCSI (hot-swappable)
Ports:	One parallel, two serial, one keyboard and one mouse

Standard features

CD-ROM drive, service processor, 1.44MB 3.5-inch diskette drive, two Ultra SCSI PCI adapters

System expansion

SMP configurations: Up to four six-way processor books (450 MHz or 600 MHz)
RAM: Up to 96GB (Chipkill)
PCI expansion slots: Up to 56
Internal disk bays: Up to 48 (hot-swappable)
Internal disk storage: Up to 873.6GB
Internal media bays: Up to eight
Attachment: SP System Attachment Adapter for use in a Cluster 1600 Configuration

RAS features

Copper, SOI microprocessors²
Chipkill RAM memory
ECC L1 data cache, L2 cache
Service processor
Hot-swappable disk bays
Hot-plug power supplies and cooling fans
Dynamic Processor Deallocation
Redundant power supplies and cooling fans

Operating system

AIX 5L™ Version 5.1 or Version 4.3.3

Power requirements

200 – 245 volts AC

System dimensions

CEC enclosure: 62" H x 22.3" W x 47.3" D (1577 mm x 565 mm x 1201 mm);
880 lbs (400 kg)*
I/O rack (36U): 71" H x 25.4" W x 45.2" D (1804 mm x 644 mm x 1147 mm);
535 lbs (244 kg)**
I/O rack (42U): 79.3" H x 25.4" W x 45.2" D (2015 mm x 644 mm x 1147 mm);
575 lbs (261 kg)**

Warranty

On site 24x7 for one year (limited) at no additional cost

* Fully loaded 24-way system with 96GB memory

** Weight will vary when disks, adapters and other peripherals are installed

Designed to save money and deliver the right amount of performance, the Cluster 1600 provides cluster management from single point-of-control, a continuous access to business-critical data and applications and investment protection through the co-existence of old and new technology. The Cluster 1600 is especially suited for business intelligence environments with large databases, for server consolidation where diverse workloads are more easily managed, and for solving the world's largest and most complex problems in high performance computing.

It is also an excellent choice for environments requiring horizontal growth, which involves replicating the same application across multiple servers as business grows. The Cluster 1600 offers a highly scalable and reliable platform for hosting extremely large and growing corporate data warehouses, or simplifying management of IT infrastructure and reducing total cost of ownership.

The AIX advantage

The pSeries 680 system is matched with AIX, the advanced UNIX operating system from IBM. Providing real value in reliability, availability and security, AIX is tuned for e-business application performance and is widely recognized as state-of-the-art in systems and network management.⁴

AIX delivers Java™ technology, Web performance and scalability enhancements for managing large, complex e-business installations. Web-based remote management tools control the system and monitor key resources such as network availability, file system status and processor workload. AIX incorporates Workload Manager, which can help ensure that critical applications remain responsive even during periods of peak system demand. AIX runs across all pSeries and RS/6000® servers for greater compatibility and investment protection.

The latest release of AIX, AIX 5L Version 5.1, adds new functionality to further improve security and system availability to enhance Workload Manager and improve Java scalability and performance. In fact, the system management and Internet/Web-application services of AIX 5L rank as industry leaders.⁴

Greater application choice

The IBM @server product line is about uncompromising flexibility in selecting, building and deploying the applications a business needs. Toward that end, IBM offers one of the industry's broadest range of platforms and operating systems. IBM is committed to industry-standard, cross-platform technologies—such as Java, XML, HTML, SOAP and UDDI—that are at the heart of a flexible e-business infrastructure. Support for these standards in our key middleware—including DB2® Universal Database™, WebSphere® Application Server and MQSeries®—means that companies won't be locked into a single platform as their businesses grow. As a result, they always have the flexibility to deploy applications in a cost-effective way.

The pSeries 680 represents the IBM **@server** product line commitment to true application flexibility through open standards. In addition to including enhanced Java scalability and performance, AIX 5L provides integrated Linux[®] system-compatible Application Programming Interfaces that allow popular Linux and Open Source applications to run on AIX with a simple recompilation. The AIX Toolbox for Linux Applications (distributed "AS IS" with AIX 5L) provides compilers, utilities, editors, debuggers and other application development tools to aid in this recompilation.

Tools for managing e-business

The pSeries 680 is backed by a comprehensive suite of offerings and resources that provide value at every stage of IT implementation. These tools can help customers test possible solutions, obtain financing, plan and implement applications and middleware, manage capacity and availability, improve performance, and obtain technical support across the entire infrastructure.

The result is an easier way to handle the complexities and rapid growth of e-business. In addition, IBM Global Services experts can help with business and IT consulting, business transformation and total systems management services, as well as customized e-business solutions.

Backed by IBM

The pSeries 680 is backed by worldwide service and support from IBM. Our commitment behind every system sold is to provide the highest possible customer satisfaction.

Availability support is enhanced with advanced maintenance and diagnostic capabilities built into the pSeries 680 offerings, with a framework for delivery of system and performance information via the Web.

The bottom line . . .

With a powerful combination of performance, scalable growth options, investment protection, reliability and flexibility, the pSeries 680 offers comprehensive solution for business-critical computing environments today and into the future. It is a strategic solution for mid- to large-size companies.

For more information

To learn more about the IBM **@server** pSeries 680, contact your IBM marketing representative or IBM Business Partner or visit the following Web sites:

ibm.com/eserver/pseries
ibm.com/servers/aix
ibm.com/eserver/clusters
ibm.com/servers/solutions
ibm.com/ibmlink
ibm.com/shop*

* IBM **@server** pSeries 680 is available through **ibm.com/shop** in the United States, United Kingdom and Canada only.



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¹ Four-way option available only with 600 MHz RS64 IV processors.

² SOI not available on 450 MHz processors.

³ IBM Chipkill Memory White paper available at www.pc.ibm.com/qtechinfo/MCGN-46AMQP.html

⁴ *2001 UNIX Function Review*, D.H. Brown Associates, Inc., March 2001 and *IBM Flexes UNIX Muscle with AIX 5L*, D.H. Brown Associates, Inc., May 2001.