Enterprise-class capabilities in a small package

IBM @server pSeries 630 Models 6C4 and 6E4

IBM @server pSeries 630 Model 6C4

IBM @server pSeries 630 Model 6E4

Highlights

- ***High-end reliability, availability and serviceability features at an entry UNIX® server price***
- ***Innovative, high-performance POWER4™ and POWER4+™ processors***
- ***Flexible deployment with desk-side and rack-mount models***

Accept no compromises

Selecting the right server for a particular solution often requires making compromises. Traditionally, businesses find they have to trade off price for reliability, flexibility and performance.

The IBM @server™ pSeries™ 630 entry server offers organizations a no-compromise solution: a very affordable, small package with enterprise-class reliability, availability and serviceability features for business-critical applications and excellent price/performance for scientific and technical computing.

The pSeries 630 is a one- to four-way symmetric multiprocessor (SMP) server featuring POWER4 technology. It is available in two packages: the Model 6C4 is an industry-standard drawer for rack mounting; the Model 6E4 is a compact deskside unit.

This combination of exceptional flexibility, performance and reliability features helps the pSeries 630 server deliver value in a variety of roles. It can easily consolidate workloads from multiple one- or two-way servers, providing increased manageability and availability in a server-farm environment. It offers a powerful, expandable standalone solution for a remote location, a department of a large enterprise or a small to mid-size business. The pSeries 630 is a great choice as a low-cost development platform for companies moving into the POWER4 environment. And it can provide a cost-effective solution for companies that need to run demanding high performance computing (HPC) applications as well as critical business solutions.

In particular, the pSeries 630 server is well-suited for handling the e-infrastructure and business processing tasks for distribution,

financial services and public sector organizations. The rack-mount Model 6C4 is planned to be optimized for the telecommunications and service provider industries with NEBS Level 3 compliance and -48 volt DC power.[1]

Head of the class

The pSeries 630 server is an integral part of the IBM @server product line—advanced servers that can help lower costs, improve efficiency and speed e-business transformation. The foundation of this server class is innovative technology from across IBM.

The pSeries 630 offers mid-range performance and capacity at an entry price—providing 1.0 GHz POWER4 or 1.45 GHz POWER4+, 64-bit processor speeds and from 1GB to 32GB of memory. 1.0 GHz and 1.45 GHz processors may not be installed on the same server. It incorporates the latest advancement in leadership chip technology from IBM, the POWER4+ microprocessor, a design enhancement of the POWER4 chip. These copper/silicon-on-insulator (SOI) chips are among the fastest 64-bit processors in the world.[2]

POWER4 technology represents an enhanced "SMP-on-a-chip" design for UNIX servers. One or two processors with shared Level 2 (L2) cache are incorporated on each chip and mounted on a processor card. Also on the card is a shared Level 3 (L3) cache which helps stage information more efficiently from system memory to application programs.

The processor card is packaged with the system memory to form a processor book—a sealed unit that protects the components in a rigid structure for greater reliability. This design simplifies upgrades. The base one-way processor card can quickly be replaced with a two-way card. Plugging in a second two-way processor book with its L3 cache and memory creates a four-way system.

Up to 16GB of system memory is available with one- or two-way systems. A maximum of 32GB of memory can be installed in a four-way system—invaluable for transaction processing and HPC applications.

The pSeries 630 supports logical partitioning (LPAR) which allows the system to be divided into independent "virtual" servers or partitions, each with its own AIX 5L™ operating system. The Hardware Management Console (HMC) for pSeries, a dedicated workstation, is used to define and manage the allocation of processors, memory and I/O resources to the partitions. The Model 6E4 supports up to three partitions while the Model 6C4 can be configured with up to four.

LPAR offers excellent flexibility in matching resources to workloads for more efficient use of the system thus helping to lower cost of ownership. It also allows developers to concurrently run and test different levels of their applications or operating system. Dynamic LPAR, which requires AIX 5L Version 5.2, allows the system administrator to dynamically reconfigure partitions—without interrupting operations—to meet changing workload demands, resulting in greater system availability.

High availability, all day, every day

To help ensure strategic applications remain highly available, the pSeries 630 incorporates additional enterprise-class technology.

Feature	Benefits
POWER4/POWER4+ microprocessors with L3 cache	• Provide improved system performance and higher reliability in a smaller, more efficient package (“SMP-on-a-chip”) • Expand performance levels for SMP commercial applications
Copper and SOI technology	• Improve processor performance and reliability while using less power and producing less heat to help conserve energy
High memory and I/O bandwidth	• Remove performance bottlenecks that can occur when fast processors must wait for data to be moved through the system — particularly important for HPC applications
Space-saving deskside or rack-mount	• Allows greater flexibility in deployment • Allows use in high-density environments, where horizontal scalability is important • Fits beside and under desks saving valuable floor space (deskside)
Up to four processors per system	• Enables flexible growth in computing power
Up to 32GB memory	• Allows exploitation of 64-bit addressing for departmental database or HPC applications • Provides growth options for much greater throughput
Chipkill™ ECC, bit-steering memory	• Significantly helps to lower number of memory failures that cause system outages, thus increasing system availability • Provides memory spares that are activated when multiple memory errors are encountered
Book packaging	• Protects processor and memory components against accidental disconnection and/or contamination • Allows for easier servicing
Front-mounted serial port	• Offers convenient connection of handheld devices for easy systems management
Wireless systems management	• Allows remote operations personnel to perform system maintenance and monitor system performance • Enables server farms to be managed more easily
LPAR	• Permits multiple applications to be consolidated on a single server, reducing the number of systems to manage and maintain • Offers greater flexibility in using available capacity and dynamically matching resources to changing business needs (requires AIX 5L v5.2)
Up to 6 hot-plug PCI-X adapter slots (1.45 GHz systems—up to 4 on 1.0 GHz systems)	• Provide growth options for significantly increased capacity at a low cost • Support many commonly used adapters for increased availability at lower cost • Allow adapters to be added or removed without interrupting the system
Hot-swappable disk bays	• Provide greater system availability and smooth growth by allowing swapping or adding disk drives without powering down the system
Built-in service processor	• 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
Redundant hot-plug power and cooling subsystems	• Enhance system availability since cooling fans and power supplies can be changed without interrupting operations • Provide backup power and cooling if primary unit fails
Dynamic processor and PCI-X bus slot deallocation	• Designed to automatically deallocate resources when impending failure is detected so applications can continue to run uninterrupted
Concurrent 32- and 64-bit application support	• Allows running 32- and 64-bit applications at the same time, helping to protect existing investments while enabling a move to more advanced technology
Linux® operating system	• Offers support for 64-bit Linux applications • Enables access to thousands of Open Source applications • Provides a common operating environment across IBM @server platforms
AIX 5L operating system	• Delivers maximum throughput for mixed workloads without the need for complex system configuration or tuning • Provides upward binary compatibility to help preserve software investments • Extends application choices with Linux affinity

IBM 7014 Model T00 rack with eight pSeries 630 Model 6C4 drawers

Each pSeries 630 system includes an integrated service processor—a computer within a computer—that constantly monitors the system's vital signs. In the event of a malfunction, the service processor working with the AIX 5L operating system is capable of "calling home" by automatically dialing out to an IBM service center, often before any problem is apparent to users or system administrators. In this fashion, the service technician may be able to correct the problem and restore system function remotely without interruption.

The service processor enables First Failure Data Capture (FFDC), which helps to virtually eliminate the need to recreate intermittent errors—a time-consuming, inefficient and sometimes impossible process. FFDC identifies and logs the source of failures in real-time and helps make it possible to determine the replacement parts necessary to fix the problem.

The pSeries 630 uses ECC (error checking and correcting) memory technology to enhance reliability and error correction of L2 and L3 cache memory, as well as main memory. ECC technology is designed to detect single- and double-bit errors and correct all single-bit errors.

To further maximize system availability, the pSeries 630 server has built-in fault and error correction functions. For main memory, Chipkill ECC memory technology—developed by IBM for mainframe servers—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 user's convenience. IBM studies indicate that IBM systems with Chipkill memory are up to 100 times less likely to experience an outage due to memory failure.[3]

In addition, redundant, spare main memory chips are provided. Through a technique known as bit-steering, these spares can be dynamically activated and replace a failing memory chip in the event multiple bit memory errors exceed a threshold.

The use of advanced memory technologies—ECC, Chipkill and bit-steering—helps protect the server from memory failures that can cause costly, unscheduled downtime. These automatically invoked functions are part of the innovative IBM @server architecture.

pSeries 630 servers also feature the ability to deallocate critical system resources, including the processors and PCI-X bus slots. In the unlikely event that one of these components fails or indicates an impending failure, this capability—working with the AIX 5L operating system and service processor—is designed to dynamically take the faulty component offline. Its workload is reassigned automatically to other processors to avoid interruption. If the system must be rebooted, previously deallocated components will not be included, therefore avoiding repetition of the error condition. Replacement of the failing component can be scheduled during normal service to minimize system and application downtime.

Reliability and availability features also include redundant hot-plug power supplies (optional) and cooling fans (optional on 1.0 GHz systems), which can be easily replaced without affecting system operations. Also available are environmental monitoring functions such as temperature monitoring that increases the fan speed in response to above-normal temperatures.

For near continuous availability, from two to 32 pSeries 630 servers can be clustered with High Availability Cluster Multiprocessing (HACMP) software from IBM. HACMP helps to minimize downtime of systems and applications, providing a superior base for high availability—an essential ingredient of business-critical environments.

Great packaging

The pSeries 630 offers the same electronics in two different packages for configuration flexibility.

The Model 6C4 is an industry-standard four EIA Unit (4U) drawer, designed to provide maximum power in a "rack and stack" environment. It can easily be installed in a 19-inch IBM or OEM rack. Up to nine Model 6C4 servers may be installed in an IBM 7014 Model T00 36U rack.

The Model 6E4 is a compact desk-side unit, just 6.8 inches wide and 24 inches deep, and fits ideally in an office environment.

Each server features one, two or four POWER4 processors running at 1.0 GHz or POWER4+ processors running at 1.45 GHz. Memory can be expanded from 1GB to 32GB. There are two integrated 10/100 Mbps Ethernet controllers, as well as three serial ports and one parallel port. And both models come with a choice of standard 110 or 220 volt auto-ranging AC power.

A pair of high-performance Ultra3 SCSI controllers are integrated into each system. This may help eliminate the need to install additional SCSI controller cards and frees PCI-X slots for other functions.

The pSeries 630 provides excellent expandability. There are four hot-swappable disk bays that can accommodate 18.2GB, 36.4GB, 73.4GB or 146.8GB drives, for total internal disk storage capacity of up to 587.2GB. There are also two media bays that can contain a combination of CD-ROM, DVD-RAM, diskette drive or tape drive. On 1.45 GHz systems, six (four on 1.0 GHz systems) 133 MHz hot-plug PCI-X slots support most pSeries 32- and 64-bit expansion adapters.

The Model 6C4 also allows the attachment of up to two 7311 Model D20 rack-mount I/O drawers for even greater expandability. Each high-density drawer adds an additional seven 133 MHz hot-plug PCI-X slots and, optionally, 12 hot-swappable disk bays. The maximum internal disk storage capacity on the Model 6C4 is 4.1TB, an astounding figure for an entry server.

Clustering for growth

Clustering allows multiple servers to be interconnected into a single computing resource for improved availability, scalability, manageability and performance.

With the IBM @server Cluster 1600, companies can manage up to 128 AIX® operating system images from a single point-of-control. A higher scalability limit of 512 is available via special order. Up to 64 pSeries 630 servers, each with its own AIX 5L operating system image, can be included in the Cluster 1600.

Designed to save money and deliver the right amount of performance, the Cluster 1600 can deliver exceptional cluster management, continuous access to business-critical data and applications, and investment protection through the coexistence of old

and new technology. A cluster of pSeries 630 servers could be an effective solution for many HPC applications that require parallel processing for faster turnaround.

Can you manage?

To help organizations deal effectively with increased complexity, IBM announced an autonomic computing initiative 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 control spiraling pressure on critical skills, software and service/support costs.

The pSeries 630 incorporates many leading self-managing system capabilities from across the IBM @server product line. For example, the system has a built-in, front-accessible serial interface for handheld devices such as the IBM WorkPad® or Palm™ to enable quick system setup, network configuration and performance monitoring using specialized IBM no-charge System Networking, Analysis and Performance Pilot software. This allows a system administrator to quickly set up and install the server within a network environment.

Other examples of self-managing capabilities include the service processor, dynamic processor and bus deallocation functions, and memory functions such as Chipkill and bit-steering. These help contribute to a reduced overall cost of ownership for the server.

The AIX advantage

The pSeries 630 system is matched with AIX 5L—the advanced, open, scalable UNIX operating system from IBM. Providing real value in reliability, availability and security, AIX 5L is tuned for e-business application performance and is recognized as state-of-the-art in systems and network management.

AIX 5L delivers Java™ technology, Web performance and scalability enhancements for managing single servers to large, complex e-business installations. Web-based remote management tools control the system and monitor key resources such as adapter and network availability, file system status and processor workload. AIX 5L incorporates Workload Manager, which can help ensure that critical applications remain responsive even during periods of peak system demand.

The Linux advantage

The Linux operating system is available for the pSeries 630 from SuSE as the “SuSE Linux Enterprise Server 8”, which includes a full complement of Open Source tools and applications. Linux does not require the use of AIX. Linux applications can share many of the same resources and benefit from many of the performance advantages of the pSeries 630.[4] Full service support for Linux is available from IBM Global Services or SuSE.

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 don’t need to be locked into a single platform as their businesses grow. The result is flexibility to deploy applications in a cost-effective way.

pSeries 630 Models 6C4 and 6E4 at a glance

Minimum configuration	
Microprocessor:	One-way 1.0 GHz POWER4 or 1.45 GHz POWER4+
Level 3 (L3) cache:	32MB on 1.0 GHz system or 8MB on 1.45 GHz system (ECC)
RAM (memory):	1GB (ECC, Chipkill)
Internal disk drive:	One 18.2GB Ultra3 SCSI
Internal disk bays:	Four hot-swappable (18.2GB, 36.4GB, 73.4GB and 146.8GB disk drives available; up to 587.2GB)
Media bays:	Two
Expansion slots:	Six (1.45GHz systems)/Four (1.0 GHz systems) PCI-X; 64-bit, 133 MHz, 3.3 volt
Bus width:	32- and 64-bit
Standard features	
I/O adapters:	Two 10/100 Mbps Ethernet controllers Two integrated Ultra3 SCSI controllers Integrated SCSI SE Controller (1.45 GHz processor systems only)
Ports:	One parallel and three serial ports
System expansion	
SMP configuration:	Two- or four-way 1.0 GHz POWER4 or 1.45 GHz POWER4+—one or two processor books
L3 cache:	64MB (32MB per processor book) on 1.0 GHz systems; 16MB (8MB per processor book) on 1.45 GHz systems
RAM:	Up to 32GB (ECC, Chipkill)—16GB per processor book
PCI-X expansion slots (Model 6C4 only):	Seven additional 64-bit adapters per I/O drawer (two maximum)
Internal disk bays (Model 6C4 only):	12 front accessible per I/O drawer (two maximum); up to 4,110GB of disk storage
RAS features	Copper, SOI microprocessors Chipkill ECC, bit-steering memory ECC L2 cache, L3 cache Service processor First Failure Data Capture Hot-swappable disk bays Hot-plug PCI-X slots, power supplies and cooling fans Dynamic Processor Deallocation Dynamic deallocation of logical partitions and PCI-X bus slots Redundant power supplies and cooling fans NEBS Level 3 compliance*
Operating systems	AIX 5L Versions 5.1/5.2 SuSE Linux Enterprise Server 8
Power requirements	100v to 127v or 200v to 240v AC / -48v DC*
System dimensions	6.8" H x 17.5" W x 24" D (172.8 mm x 444.4 mm x 609.6 mm)—standard 4U rack-mount 20.9" H x 11.8" W x 28.5" D (530 mm x 300.0 mm x 725.0 mm)—deskside Weight: 79.2 lb (36.0 kg)**—deskside; 70.4 lb (32.0 kg)**—rack-mount
Warranty	Onsite, next-business-day for one year (limited) at no additional cost Warranty and maintenance upgrades available

* Statement of General Direction announced.

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

The pSeries 630 server represents the IBM @server commitment to true application flexibility through open standards. In addition to including enhanced Java scalability and performance, AIX 5L provides Application Programming Interfaces (APIs) that allow popular Linux and Open Source applications to run on AIX 5L with a simple recompilation. The AIX Toolbox for Linux Applications provides utilities, editors, debuggers and other application development tools to aid in this recompilation.

Managing e-business

The IBM @server product line is backed by a comprehensive suite of offerings and resources that provides value at every stage of IT implementation. These can help companies test possible solutions, obtain financing, plan and implement applications and middleware, manage capacity and availability, improve performance and obtain technical support across their entire infrastructure. The result is an easier way to help businesses 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.

More value

Pre-configured Express Configurations for pSeries 630 systems are easy to order with extensive features to meet the needs of mission-critical environments. They are available for AIX 5L or Linux at a cost saving from standard prices for an outstanding value.

Backed by IBM

pSeries 630 systems are backed by worldwide service and support from IBM. The one-year basic warranty is end-to-end and includes operating system support, hardware fixes, manned phone hardware support and call tracking.

The basic warranty provides Monday to Friday, 8 A.M. to 5 P.M., on-site, next-business-day service, and warranty upgrades are available including 24x7x365 coverage with a four-hour response time objective. The warranty terms and conditions may be different in some countries. Please consult your local IBM marketing representative or IBM Business Partner for country-specific terms and conditions.

Summary

By incorporating technology from IBM's most advanced enterprise servers, the pSeries 630 server helps eliminate the compromises of most entry systems. In fact, the pSeries 630 delivers the reliability, performance and scalability features commonly associated with much larger systems in a smaller, more affordable package.

Many small- to mid-size businesses may find that they can easily handle all their business-critical computing tasks with the pSeries 630, allowing them to consolidate workloads onto a single, easy-to-manage server. For others, it provides a perfect building-block for creating a scalable, rack-dense foundation for application solutions. And the power, capacity and enterprise-class capabilities of the pSeries 630 server make it an ideal choice for any company looking to strengthen its e-business infrastructure with highly reliable, highly available components.

In short, the pSeries 630 server is one of the most innovative entry servers available today, a no-compromise solution that helps companies better align their IT infrastructure with their business needs—today and tomorrow.

For more information

To learn more about the IBM @server pSeries 630 Models 6C4 and 6E4, 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**/servers/solutions
- **ibm.com**/ibmlink

[1] *Statement of Direction* announced for 1H 2003

[2] Based on SPEC CPU2000 benchmarks as of February 18, 2003 available at www.spec.org

[3] IBM Study by Timothy J. Dell, "A White Paper on the Benefits of Chipkill-Correct ECC for PC Server Main Memory," (November 25, 1997) available at: http://www.**ibm.com**/servers/eserver/pseries/campaigns/chipkill.pdf

[4] Many of the pSeries 630 features described in this document are operating system dependent and may not be available on Linux. For more information, please check: www.**ibm.com**/servers/eserver/pseries/linux/whitepapers/linux_pseries.html

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