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+ processors***
- ***Flexible deployment with desk-side and rack-mount models***

Accept no compromises

Selecting the right server for an on demand environment 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 designed for on demand 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 can also 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 has been optimized for the telecommunications and service provider industries with NEBS Level 3 compliance and optional redundant -48 volt DC power.

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 transformation to e-business on demand™. The foundation of this server class is innovative technology and solutions from across IBM.

The pSeries 630 offers mid-range performance and capacity at an entry price—providing 1.2 or 1.45 GHz POWER4+™, 64-bit processors and from 1GB to 32GB of memory. To help preserve investments, existing systems with 1.0 GHz POWER4 processors may be upgraded to a 1.45 GHz POWER4+ configuration. The pSeries 630 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[1].

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 8MB of 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 sealed unit that protects the components in a rigid structure for greater reliability. This design simplifies upgrades. The base one-way processor card can be replaced with a two-way card. Plugging in a second two-way processor card with its L3 cache and memory creates a four-way system. For optimum performance, a two-way system can be configured with two 1-way processor cards.

Designed to support the incredible speed of the processors, pSeries 630 architecture also features a peak aggregate memory to L3 cache bandwidth of 12.8GB per second in a four-way configuration. In addition, the system can deliver aggregate I/O subsystem bandwidth of up to 4GB/second. With its unique system architecture, the entry pSeries 630 offers the speed and power to deliver efficient, cost-effective data sharing and application throughput.

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

Feature	Benefits
Up to four POWER4+ microprocessors with L3 cache	• Provide improved system performance and higher reliability for commercial applications in a smaller, more efficient package ("SMP-on-a-chip") • Enables flexible growth in computing power
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 in high-density environments • Fits beside and under desks saving valuable floor space (deskside)
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 to be activated when multiple memory errors are encountered
Processor card packaging	• Protects 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 personnel to perform system maintenance and monitor 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)
Six hot-plug PCI-X adapter slots	• Provide growth options for increased capacity • 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
NEBS Level 3 compliance (Model 6C4)	• Offers rugged packaging and optional DC power required for telecommunications central office operations and other harsh computing environments
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
IBM @server Cluster 1600	• Provides centralized management of multiple interconnected systems • Provides ability to handle unexpected workload peaks by sharing resources • Allows for more granular growth so user demands can be readily satisfied
Linux operating system	• Offers support for 32- and 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

Partitioning for quick response to change

IBM's logical partitioning (LPAR) implementation provides outstanding flexibility in matching resources to workloads, facilitating higher efficiency and lower total cost of ownership (TCO), while providing robust isolation of operating environments. The pSeries 630 Model 6E4 can be divided into up to three and the Model 6C4 into up to four independent servers or partitions, each with its own memory, processors, I/O and copy of the AIX 5L™ or Linux operating system. By enabling consolidation of applications using both operating systems onto a single platform, the pSeries 630 can increase system utilization, provide greater flexibility of managing the dynamics of multiple workloads in a single server, reduce complexity and deliver significant administration savings.

Based on business requirements and application needs, administrators can assign and manage resources in any combination using a single interface—the Hardware Management Console for pSeries. This dedicated workstation is used to define and manage the allocation of processors, memory and I/O resources to partitions. Dynamic LPAR, a function of AIX 5L Version 5.2, even allows reallocation of system resources without rebooting the affected partition and the creation of new partitions from resources removed from one or more partitions. Unused I/O expansion PCI slots and disk bays can also be populated concurrent with system operation to create new partitions. IBM's dynamic partitioning capabilities mean that partition changes can take effect much more rapidly, enabling companies to respond faster to changing requirements.

Keeping business processes running

Several innovations stemming from the IBM autonomic computing initiative—a blueprint for self-managing systems—contribute to uncompromising pSeries reliability, manageability and serviceability. Its goal is to create an intelligent IT infrastructure that responds to unexpected capacity demands and to system failures while at the same time helping to control spiraling pressure on critical skills, software and service/support costs.

To boost availability, an integrated service processor in every pSeries 630 server monitors system health. This feature can detect error conditions within the hardware and automatically place a service call to IBM, often before the problem becomes apparent to users. Then, if repairs are necessary, the service processor can initiate dynamic reconfiguration to correct the failure. In this manner, automated monitoring helps businesses minimize costly outages and reduce administrative overhead and support costs.

First Failure Data Capture (FFDC) identifies and logs the source and root cause of system failures to help prevent the reoccurrence of intermittent failures that diagnostics cannot reproduce. Designed to prevent outages and reduce repair time by identifying failing components in real time, FFDC contributes to outstanding pSeries system availability.

IBM Chipkill memory technology allows detection and correction of most multi-bit memory errors. This protection from memory failures helps prevent costly system memory crashes and improves pSeries reliability. In fact, IBM studies show that systems with Chipkill memory are up to 100 times less likely to have outages because of memory failure[2].

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

To help prevent system shutdowns caused by main memory and cache errors, error checking and correcting (ECC) memory detects both single- and double-bit errors and can correct all single-bit errors dynamically—complementing Chipkill memory to improve reliability. In addition, the pSeries 630 includes redundant, spare main memory chips. Through a technique known as bit-steering, these spares can be dynamically activated and replace a failing memory chip in the event that multiple memory bit errors exceed a threshold.

The pSeries 630 server also features 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—can dynamically take the faulty component offline. The system automatically reassigns the workload to other resources to avoid interruption. If the system must be rebooted, previously deallocated components will not be included, to avoid repetition of the error condition. Failing components can be replaced 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 1.2 GHz systems), which can be easily replaced without affecting system operations. Environmental monitoring functions—such as temperature monitoring that increases the fan speed in response to above-normal temperatures—boost reliability by helping to maintain the correct conditions for flawless system operation.

The pSeries 630 has a built-in, front accessible serial interface for hand-held devices such as the IBM WorkPad® or Palm™ to enable fast system setup, network configuration and performance monitoring using specialized IBM no-charge System Networking, Analysis, and Performance Pilot software facilitating rapid deployment of the server within a network environment.

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)[2] 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 1.2 or 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. Hot-plug -48 volt DC power is optionally available for the Model 6C4.

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 CD-ROM, DVD-ROM, DVD-RAM, diskette or tape drive. Six 133 MHz hot-plug PCI-X slots are included to 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 on demand availability

Clustering—an advanced computing technique designed to promote performance, scalability and availability—allows multiple servers to be interconnected into a single computing resource. Designed for near-continuous availability in an on demand environment, the IBM @server Cluster 1600 can deliver manageability, continuous access to business-critical data and applications, and investment protection through the coexistence of old and new technology. Diverse workloads such as Web serving and hosting, enterprise resource planning (ERP), enterprise resource management (ERM), supply chain management (SCM), business intelligence (BI) and HPC can all benefit from the reliability, availability and manageability offered by pSeries clusters.

With the Cluster 1600, companies can manage up to 128 AIX 5L 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 Model 6C4 servers, each with one to four LPARs can be included in a Cluster 1600 (maximum of 128 LPARs). Each server can be clustered with either an industry standard Ethernet or an SP™ Switch2 interconnection with the SP Switch2 PCI-X adapter.

pSeries 630 Models 6C4 and 6E4 at a glance

Minimum configuration	
Microprocessor:	One-way 1.2 GHz or 1.45 GHz POWER4+
Level 3 (L3) cache:	8MB (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 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
Ports:	One parallel and three serial ports
System expansion	
SMP configuration:	Two- or four-way 1.2 GHz or 1.45 GHz POWER4+—one or two processor cards
L3 cache:	16MB (ECC)—8MB per processor card
RAM:	Up to 32GB (ECC, Chipkill)—16GB per processor card
PCI-X expansion slots (Model 6C4 only):	Seven additional 64-bit adapters per 7311-D20 I/O Drawer (two maximum)
Disk bays expansion (Model 6C4 only):	12 front accessible per 7311-D20 I/O Drawer (two maximum): up to 3.5TB of additional 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, AC and DC power supplies and cooling fans Dynamic Processor Deallocation Dynamic deallocation of logical partitions and PCI-X bus slots Redundant cooling fans Redundant AC and DC power supplies NEBS Level 3 compliance (Model 6C4)
Operating systems	AIX 5L Versions 5.1/5.2 SuSE Linux Enterprise Server 8 or Turbolinux Enterprise Server 8
Power requirements	100v to 127v or 200v to 240v AC / -48v DC (Model 6C4)
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, 8 A.M. to 5 P.M., next-business-day for one year (limited) at no additional cost Warranty and maintenance upgrades are available

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

Open standards for e-business

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 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 such as adapter and network availability, file system status and processor workload. AIX 5L also incorporates Workload Manager, which can help ensure that critical applications remain responsive even during periods of peak system demand.

The pSeries 630 exemplifies 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 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.

Linux support offers versatility

The Linux operating system, available for the pSeries 630 from SuSE, "SuSE Linux Enterprise Server 8", and from Turbolinux, "Turbolinux Enterprise Server 8", offers a package that includes a full complement of Open Source tools and applications. Linux on the pSeries 630 does not require the use of AIX 5L. Linux applications can run natively or in an LPAR and can benefit from many of the performance features of the pSeries 630[4]. IBM Global Services, SuSE and Turbolinux all offer service and support for Linux.

Greater application choice

The IBM @server product line offers uncompromising flexibility in selecting, building and deploying the applications businesses need to succeed in today's on demand world. 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 that form the core of a flexible e-business infrastructure.

Support for these standards in key middleware—including DB2® Universal Database™, WebSphere® Application Server and MQSeries®—means that companies need not get locked into a single platform as their businesses grow. By embracing open standards, companies gain the flexibility to deploy applications in a highly cost-effective way.

Managing an on demand e-business

The IBM @server product line is backed by a comprehensive suite of offerings and resources that provide 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 complexities and rapid growth in an on demand world.

IBM Global Financing offers a wide range of financing options to help manage the bottom-line and meet the varying needs of e-business on demand.

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 savings 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 hardware warranty provides 8 A.M. to 5 P.M., on-site, next-business-day service. Warranty upgrades, including 24x7x365 coverage with a four-hour response time objective, are available. 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 smaller, more affordable deskside or rack packages.

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 on demand 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
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[1] Based on SPEC CPU2000 benchmarks as of May 27, 2003 available at www.spec.org

[2] 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

[3] One EIA-unit is 1.75 inches (4.5cm) and is the industry standard for rack measurements.

[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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