IBM *@*server **pSeries 630 Models 6C4 and 6E4**

IBM @server pSeries 630 Model 6C4

Highlights

- **High-end reliability, availability and serviceability features at an entry UNIX** server price**

- **Innovative, award-winning[1] POWER4 processor**

- **Flexible deployment with deskside 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 organisations a no-compromise solution – a very affordable, small package with enterprise-class reliability, availability and serviceability features for business-critical applications and good price/performance for scientific and technical computing.

The pSeries 630 is a one- to four-way symmetric multiprocessor (SMP) server featuring award-winning[1] POWER4 technology. It is available in two packages – the Model 6C4 is an industry-standard drawer for rack mounting and 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 medium sized business. The pSeries 630 is a great choice as a low-cost development platform for companies moving into the POWER4 environment. 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 organisations. The rack-mount Model 6C4 is planned to be optimised for the telecommunications and service provider industries with NEBS Level 3 (L3) compliance and -48 volt DC power.[2]

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 incorporates the same 64-bit POWER4 'SMP-on-a-chip' microprocessors as the pSeries 670 and 690. These copper/silicon-on-insulator (SOI) chips are so advanced that they have twice received the best workstation/server processor award from *MicroDesign Resources*[1] and are a major reason why the pSeries 690 has won an *eWeek* eXcellence Award[3] and a *VAR Business* Editor's Choice Award.[4]

One or two 1.0 GHz processors are incorporated on each chip with shared Level 2 (L2) cache and mounted on a processor card. Also on the card is 32MB of L3 cache,

which helps stage information more effectively 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 designed to provide higher reliability.

This design greatly simplifies up-grades. 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.

Later in 2002, the pSeries 630 is planned to support dynamic logical partitioning (LPAR). This will allow the system to run multiple partitions, each with its own system resources such as processor, memory, input/output (I/O) and operating system.

LPAR will provide new options for horizontal scalability so that developers can run and test different levels of their applications or operating system. It will also enable greater flexibility in matching resources to workloads for more efficient use of the system. It will also allow the system administrator to dynamically reconfigure partitions – while still operating – to meet changing workload demands.

High availability, all day, every day
To help ensure strategic applications remain highly available, the pSeries 630 incorporates additional enterprise-class technology.

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 is capable of 'calling home' by automatically dialing out to an IBM service centre, 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 error checking and correcting (ECC) 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 errors and correct all single-bit errors.

Feature	Benefits
POWER4 microprocessors	• 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
L3 cache	• Provides increased application performance
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 an important factor • Fits beside and under desks saving valuable floor space (deskside)
Up to four processors per system	• Enables flexible growth in computing power
Up to 16GB memory	• Allows exploitation of 64-bit addressing for departmental database or HPC applications • Provides growth options for much greater throughput
Chipkill* 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
64-bit system architecture	• Supports larger amounts of memory so applications can keep more information accessible in fast-access memory (less need to retrieve data from online storage), allowing applications to run faster
Up to four hot-plug PCI-X adapter slots and 293GB of disk storage	• Provide growth options for significantly increased capacity without adding an expansion chassis • Support many commonly used adapters for increased availability at lower cost
Hot-swappable disk drive 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, L2/L3 cache 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
AIX* 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

To further maximise system availability, the pSeries 630 server has built-in fault and error correction functions. For main memory, Chipkill 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.[5]

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 L2/L3 cache (on four-way systems) 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 operating system and service processor – is designed to dynamically take the faulty component offline. Its workload is reassigned automatically to other resources such as processors and memory, 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 minimise system and application downtime.

Reliability and availability features also include optional redundant hot-plug power supplies and cooling fans, 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 minimise downtime of systems and applications, providing a superior base for high availability. This is 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 470 mm four Electronic Industries Association Unit (4U) drawer, designed to provide maximum power in a 'rack and stack' environment. It can easily be installed in an existing IBM or 470 mm original equipment manufacturer rack. Up to nine Model 6C4 servers may be installed in an IBM 7014 Model T00 36U rack.

The Model 6E4 is a compact deskside unit, just 172 mm wide and 609 mm deep and fits ideally in an office environment.

Each server features one, two or four POWER4 processors running at 1.0 GHz. Memory can be expanded from 1GB to 16GB. There are two integrated 10/100 Mbps Ethernet connections, as well as three serial ports and one parallel port. 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 Small Computer System Interface (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 or 73.4GB drives, for total internal storage capacity of up to 293.6GB. In addition, there are two media bays that can contain a combination of CD-ROM, DVD-RAM, diskette drive or tape drive. Four 133 MHz hot-plug PCI-X slots support most pSeries 32- and 64-bit adapters.

In late 2002, the Model 6C4 is planned to gain even greater expandability with the introduction of a high-density I/O drawer. This expansion drawer will add an additional seven PCI-X slots, as well as 12 hot-swappable disk bays.

Clustering for growth
Clustering allows the interconnection of multiple servers into a single computing resource for improved availability, scalability, manageability and performance. Designed to save money and deliver the right amount

of performance, the IBM @server Cluster 1600 can deliver single-point-of-control management, continuous access to business-critical data and applications and investment protection through the coexistence of old and new technology.

With the Cluster 1600 and AIX operating system, companies can mix or match up to 128 nodes and servers (512 via special order). The inclusion of a low-cost pSeries 630 in a Cluster 1600 is planned for later in 2002. When interconnected with the high-speed SP* Switch2, 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 organisations deal effectively with increased complexity, IBM announced Project eLiza* – a blueprint for self-managing systems. Its goal is to create an intelligent information tehnology (IT) infrastructure that responds to unexpected capacity demands or to system failures. By using technology to minimise human intervention, businesses can react faster to changing circumstances while at the same time control spiralling 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 specialised 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 cache deallocation functions and memory functions such as Chipkill and bit steering.

The AIX advantage
The pSeries 630 server is matched with AIX 5L* 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 recognised as state of the art in systems and network management.

AIX delivers Java¨ technology, Web performance and scalability enhancements for managing large and 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 also 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 IBM RS/6000* servers for greater compatibility and investment protection.

pSeries 630 Models 6C4 and 6E4 at a glance

Minimum configuration	
Microprocessor:	One-way 1.0 GHz POWER4
L3 cache:	32MB (ECC)
Random access memory (RAM):	1GB (ECC, Chipkill)
Internal disk drive:	One 18.2GB Ultra3 SCSI
Internal disk bays:	Four hot-swappable
Media bays:	Two
Expansion slots:	Four PCI-X (64-bit), 133 MHz, 3.3 volt
Bus width:	32- and 64-bit

Standard features	
I/O adapters:	10/100 Mbps Ethernet controller with two ports
	Two integrated Ultra3 SCSI controllers
Ports:	One parallel and three serial ports

System expansion	
SMP configuration:	Two- or four-way 1.0 GHz POWER4 – one or two processor books
L3 cache:	64MB (ECC) – 32MB per processor book
RAM:	Up to 16GB (ECC, Chipkill) – 8GB per processor book
PCI-X expansion slots:	Seven additional hot-plug adapters per optional I/O drawer[†]
Internal disk bays:	12 front accessible hot-swappable per optional I/O drawer[†]

RAS features	
	Copper, SOI microprocessors
	Chipkill, 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 (four-way only)
	Dynamic deallocation of L2/L3 cache (four-way only) and PCI-X bus slots
	Optional redundant power supplies and cooling fans
	NEBS Level 3 compliance[†]

Operating system	AIX 5L Version 5.1

Power requirements	100v to 127v, or 200v to 240v AC / -48v DC[†]

System dimensions	172.8 mm H x 444.4 mm W x 609.6 mm D – standard 4U rack-mount
	444.4 mm H x 172.8 mm W x 609.6 mm D – deskside
	Weight: 15.9 kg[††]

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.

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, Extensible Markup Language, Hypertext Markup Language, Simple Object Access Protocol and Universal Description, Discovery and Integration – 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.

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 with a simple recompilation. The AIX Toolbox for Linux Applications provides utilities, editors, debuggers and other application development tools to aid in this recompilation.

For customers who have a requirement for running the Linux operating system natively, IBM anticipates that support for the pSeries 630 will be available from one or more Linux distributors in the third quarter of 2002. This opens up the possibility of greatly simplifying an e-business infrastructure by providing a pervasive, open platform for the development and deployment of e-business applications. Linux applications can benefit from the reliability, flexibility and performance advantages of the pSeries 630.

Tools for 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 tools 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 customised e-business solutions.

IBM financing

IBM offers innovative and flexible financing solutions designed to make the acquisition of a pSeries 630 server easy and affordable. With TOTAL Solution Financing, organisations can lease their systems to overcome budget constraints and help reduce total cost of ownership. TOTAL Solution Financing provides one-stop shopping for a total IT solution and can help turn up-front costs into low monthly payments while preserving credit lines for other investments. Companies can also easily add capacity or upgrade at any time during the lease. More information on the benefits of IBM Global Financing is available.[6]

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.

In the United States, the basic warranty provides next-business-day service, and warranty upgrades are available for same-business-day service or 24hours a day, 7days a week, 365 days a year coverage with a four-hour response time objective. In other countries, the warranty terms and conditions may be different. Please consult your local IBM marketing representative or IBM Business Partner for country-specific terms and conditions.

Summary

Like the pSeries 690 and 670 before it, the pSeries 630 server helps redefine the UNIX server landscape.

By incorporating technology from the most advanced enterprise servers from IBM, 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 mid-range systems in a smaller, more affordable package.

Many small-to-medium 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. The power and enterprise-class capabilities make the pSeries 630 server 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
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