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GUNFIGHT AT SUNSET

Positioning the IBM @server pSeries™ 610 "Colt" Models 6C1 and 6E1

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Abstract
Code named "Colt" - after the gun that won the West - during development, IBM's newest @server pSeries 610 Models 6E1 and 6C1 demonstrate an innovative union of high end server technology and architecture with versatile entry level server packaging. The combination of large system RAS characteristics, enhanced wireless system management capabilities, operating system versatility, and industry leading price performance makes the IBM p610, in both tower and rack form, a highly competitive solution to a wide range of customer requirements.

Announcement Overview
IBM cleverly enables the p610 to be configured as either a one- or two-way general purpose server, in either the Model 6E1 (mini-tower) or 6C1 (high density rack-mount) form factor . The system supports either 375 or 450 MHz POWER3-II copper-based microprocessors - and is able to deliver high levels of commercial and computational performance with less power consumption (and resulting higher reliability).

High end server RAS characteristics and low-end ease of installation, setup and use - enhanced with industry-leading third generation remote system management tools - makes the p610 a robust, versatile, and cost effective platform for a variety of application development and deployment scenarios. As in the IBM pSeries 640, there are significant hardware and operating system advantages in the p610 that strongly favor the new IBM system in the rapidly growing e-business space. With this new "Colt" in its arsenal, IBM stands to develop an even more commanding position in the entry server shoot-out

Background
Since October 2000, IBM's market share in the low end of the Unix® server business has grown dramatically. The announcement of the p640 Model challenged Sun's previous dominance of the 1-4 way entry server space. In ETG's view, the popularity of the p640 has contributed to a measurable decline in Sun business volumes in the fastest growing segment of the high volume server business.

With the October 2001 announcement of the p610 1-2 way "Colt", IBM fires another pSeries shot across Sun's bow - this time with an elegant and inventive 1-2 way SMP server that combines industry leading features, form factors, functions and technologies from across the IBM @server product line.

System Positioning
Up until this point, the very low end of the IBM Unix server family has been populated by dual purpose systems like the 43P and 44P that were packaged as towers, and designed around the requirements for both single user technical workstations and multi user servers for smaller work groups. To satisfy the needs of the workstation user, the system designs had to encompass features like graphics adapters that weren't particularly useful in a small commercial server deployment - and although the tower form factor was appropriate for the single user, it didn't lend itself to system replication in a server farm.

With the p610, IBM breaks away from the limitations imposed by dual purpose design objectives, and creates a new standard for the industry in the 1-2 way Unix server space. It combines high end system RAS, manageability, and function with the innovative packaging and ease of installation and maintenance characteristic of the PC space - while offering users substantial cost of ownership advantages.

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The Convertible

First, the p610 offers users unprecedented form factor versatility. It's truly a "convertible" packaging implementation! For starters, the same system can be ordered as either rack mountable (Model 6C1) or in a mini-tower chassis (Model 6E1). This by itself is significant - accomplished by adapting a clever IBM industrial design to POWER3-II technology requirements. But the real packaging versatility of the system is the ability to convert a tower mounted system - perhaps initially installed as the test/development system for a new application - into a rack mounted system, as the application is deployed on multiple rack mounted servers.

This versatility increases the number of deployment alternatives available to a customer, extends the potential useful life of the system, and can reduce the long term cost of ownership.

Hardware Specifications

	IBM pSeries 610	**Sun Enterprise™ 250**	**Sun Fire™ 280R**
Maximum # of CPUs	2	2	2
Processors	375 - 450 MHz POWER3-II	400 MHz UltraSPARC II	750 MHz UltraSPARC-III
Level 1 Cache (D/I)	64KB / 32KB	16KB / 16KB	64KB / 32KB
Level 2 Cache	4MB - 8MB	2MB	8MB
Memory	8GB	2GB	8GB
Internal Disk Capacity	291GB	218GB	36GB
I/O Slots	5 PCI	4 PCI	4 PCI
Tower - Rack Conversion	YES	NO	NO

As in the case of nearly all comparisons between IBM @server systems and other vendor's offerings, the p610 is characterized by substantially larger caches, or more system memory per processor, and/or support for larger I/O subsystems. These factors should combine to enable the p610 to substantially outperform comparable priced competitive systems like the 400 MHz Sun E250 - and to approach - if not exceed - the performance of the 750 MHz Sun 280R, in SPEC benchmarks (like CINT2000 and CFP2000) at a fraction of the price!

As a general rule, IBM @server systems offer more robust system design and implementation, and more extensive support for system Reliability, Availability, and Serviceability than alternative competitive systems. The p610 is no exception.

All that RAS

Some of the major differentiators between IBM pSeries servers like the p610 and alternative competitive systems are standard IBM hardware and software features that just aren't found on non-IBM systems. Many of these features support RAS capabilities, like First Failure Data Capture, that were originally implemented on very large IBM systems - mainframes and larger AIX servers - but have since been implemented on entry servers like the p610.

Like the pSeries 640, the p610 is loaded with reliability features like hot-swappable disk drives, redundant hot-plug power capability, redundant cooling fans, positive card retention devices and integrated cable management mechanisms that protect cabling during routine maintenance and system upgrades.

A creative byproduct of collaborative design efforts between xSeries and pSeries teams can directly impact system serviceability. In the unlikely event of a hardware failure, Light Path Diagnostics™, available in a Unix server for the first time, provide a convenient "dashboard" for rapid fault determination and restoration of service with minimum downtime. Within the server drawer, diagnostic panel lights and lights on system components allow instant identification of failed or failing field replaceable units: power supplies, fans, CPU

cards, or actual DIMMs on memory cards. When combined with the high end RAS features supported by the system, p610 Light Path Diagnostics can have a major impact on maximizing system up time and minimizing the costs of hardware downtime.

The p610 system was designed to operate in either a stand-alone or large server farm environment. To aid in system administration, IBM cleverly integrated a programmable attention "beacon" on both front and rear of the rack-mounted system. A system administrator at a remote off-site location can trigger the beacon to help an on-site technician locate the system in a forest of rack mounted IT equipment. IBM also provides an optional rack mounted warning light which can identify the appropriate rack enclosure from an even greater distance.

RAS Characteristics

Standard Features	IBM pSeries 610	Sun E250 - Sun Fire 280R
Dedicated Service Processor	YES	NO
Advanced Wireless System Administration	YES	NO
Redundant Fans	YES	NO
Persistent Deallocation	YES	NO
Wide Area Clustering	YES	NO
First Failure Data Capture	YES	NO
Light Path Diagnostics	YES	NO

Major differentiators between the p610 and competitive alternatives can be found in the system Reliability, Availability, and Serviceability (RAS) characteristics.

- **RELIABILITY** - The ability to avoid system or component failure.
- **AVAILABILITY** - The ability to minimize the effects of system or component failure
- **SERVICEABILITY** - The ability to repair a failed system or component

The **RELIABILITY** of the p610 is enhanced by the presence of a fully integrated service processor - similar to high end IBM @server systems - which continuously monitors system internal variables such as heat buildup, power and voltage levels, and normal error handling. By detecting and isolating potential hardware problems before they occur, the system performs *predictive* maintenance. If any of the monitored variables exceeds allowable tolerances, the service processor automatically invokes a "call home" feature to notify system administrators or service technicians of a potential component or system level failure. Methods of calling home include both traditional dial-up calls and advanced wireless communications. By continuously identifying and eliminating "the weakest links", the p610 is able to avoid many potential component failures or unplanned system outages.

System **AVAILABILITY** is enabled by a combination of system design and implementation features. In addition to being hot-swappable, some critical system components, like fans and power supplies are designed to support redundant back up. The Service Processor can automatically enable the back up device, deallocate the failed device, and initiate a call for service that identifies the failed component. Persistent Deallocation, an IBM @server exclusive, removes a deallocated component from hardware initialization during the boot sequence, eliminating the chance of recurring failure at reboot. p610s may be clustered, either locally or remotely, with other pSeries or RS/6000® servers that support rapid fail-over and recovery in the unlikely event of an unrecoverable system error - or in automatic response to other more widespread emergencies that may require immediate off-site system back up and recovery. These "self healing" features deliver obvious value to customers whose business needs demand 24X7 service.

SERVICEABILITY of the p610 is enriched by other industry-leading features, including First Failure Data Capture - the key to a truly self-diagnosing system. While other vendors rely on technical support staffs to

attempt to recreate error conditions in order to identify and resolve difficult intermittent problems, the p610 service processor - like the most advanced high end IBM @server systems - logs the exact nature of any failure when it first occurs, and prescribes the corrective action required. In the event of major component failure (system board, power board, fan, power supply, memory, PCI slot or CPU) the Light Path Diagnostic "dashboard" pinpoints the exact physical location of the failure, minimizing the time required for problem resolution.

This winning combination of RAS features, function, and benefits is unmatched in the industry - and offers users the robustness and availability of much more expensive systems at a fraction of the price.

Operating System Versatility

By offering support for both AIX® Version 4.3.3 as well as AIX Version 5.1, the p610 positions itself as an immediately deployable platform for use by customers, ISVs and solution providers operating in either environment. With list prices in the range of $7,500 to $15,000, the systems are obvious candidates for extensive use among small and medium sized customers whose applications require the scaleability and reliability of SMP systems - and for placement by IBM business partners and ISVs who should appreciate the advanced remote system administration and "self-healing" capabilities of the p610.

In larger establishments, p610s might reasonably be used to deploy servers in smaller remote facilities that mirror the software stack of larger centralized servers. In a large centralized facility, the p610 can also serve as an ideal SMP test/development/migration engine for systems software, middleware, or applications to be subsequently deployed on larger production systems.

The ongoing success of IBM's Solaris to AIX crossover training for AIX systems administrators suggests that the p610 might also find a place in otherwise non-IBM customer establishments as a platform to support a "prototype" test or migration system environment for new AIX users.

In addition, the p610 is targeted to be one of the first pSeries systems to support the coming 64-bit Linux kernel, further extending the versatility of the system in new application development, test and deployment.

In summary, while Sun's rack mounted alternative, the 280R, supports only Solaris™ 8 - with no "N-1" capability to support previous OS releases - the p610 user can develop or deploy applications under AIX 4.3.3, AIX 5.1 (with Linux affinity), or ultimately by installing the 64 bit Linux kernel.

This kind of versatility can pay significant dividends to users by simplifying operating system transitions, and letting customers, rather than the vendor, decide how and when to migrate to a new environment.

Advanced System Administration Tools

As a final note, the pSeries 610 system management environment represents third generation, IBM designed management features optimized for the Internet or corporate intranet networks. Introduced in 1999, the RS/6000 B50 featured system and application management functions using a simple interface on a handheld Palm or IBM Workpad PDA. The popularity of this new system management facility, designed for quick system installation and application setup, caused IBM to add hardware features which further enhance the use of this rapidly emerging handheld technology. The pSeries 640, and now the p610, feature a walk up, plug-in console ports for these devices on the front bezel to simplify the use of these applications even further.

The pSeries 610 server is designed for customer setup and installation of optional features. To simplify this process, an on-site technician with minimal training can plug a handheld PDA device into the system. A PalmOS application establishes a secure connection with the p610 and guides the technician through a quick setup application using a simple point-and-tap interface. In remote off-site locations where on site technical support is expensive, this application was can enable quick setup and installation on the user's

network, providing almost immediate access to off-site system administrators and automated installation and setup procedures.

The AIX operating system interface to these handheld devices was designed to make AIX "Palm aware" and allow quick customization by users with unique setup or installation requirements. This application infrastructure can also be modified to provide remote access to these systems for real-time system and application management via wireless devices --- such as a cell phone or Palm device --- anywhere in the wireless networked world.

In both plug-in and wireless scenarios, the p610 system management architecture is far ahead of alternative competitive solutions. Availability of these innovative system management utilities demonstrates IBM's eagerness to establish and maintain a position of industry leadership - and offers IBM customers the ability to substantially reduce the costs and complexity of system administration and support.

Conclusion

Announcement of the IBM pSeries 610 models confirms IBM's hot pursuit of success in the entry level Unix server space. The unique combination of high end server RAS and manageability tools, advanced microprocessor technology, excellent price-performance, and innovative and versatile packaging makes the system a clearly superior alternative to other one- and two-way systems like the Sun Enterprise™ 250 and Sun Fire™ 280R.

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