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IBM's pSeries 630 — Implications of POWER 4 for Unix Entry Customers

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Catalyst

Customer implications of a vendor announcement

Question

How does the introduction of POWER 4 change IBM's position in the one- to four-way entry Unix arena? Should existing RS/6000 and pSeries entry systems customers consider an upgrade?

Answer

On June 25, one week after **Sun** announced the Sun Fire V480, **IBM** redefined the entry midrange Unix sector with the announcement of the pSeries 630, essentially completing its plan to cascade its high-end POWER 4 microprocessor down through both midrange (the pSeries 670) and entry system server packaging. Most importantly, all the same reliability features found in the high-end pSeries 690 and midrange pSeries 670 have been designed into the entry pSeries 630 package. In fact, Giga believes that five key systems aspects of the p630 makes it a compelling solution in the entry systems Unix arena (note that Dynamic LPAR support and cluster support will not be available until the fourth quarter of 2002):

- Operating system flexibility: While AIX 5L offers the performance scalability, reliability and workload management functionality critical to a mission-critical Unix environment, Linux support is also a key part of the entry midrange server segment. Not only does AIX provide a set of Linux affinity tools that allows customers to run Linux applications on p630, but native Linux support is also expected by the fourth quarter of 2002.
- Granularity of reliability features: The multiple layers of reliability features (often dubbed as Project Eliza) essentially lead to a higher level of system redundancy and self-management, lowering the cost of ongoing maintenance by limiting both service calls and potential downtime (see table below).
- SMP-on-a-chip: POWER 4 microprocessor, essentially the first server design containing two one-gigahertz processors, a high-bandwidth systems switch, a larger memory cache and I/O interface, is now offered in a four-way single chip module (SCM) design. This significantly improves performance scalability, both with technical and commercial applications deployments.
- Virtual (Dynamic LPAR) servers: The p630 can either be operated as a single large SMP, or divided into as many as four "virtual servers" set up to run one or more multiple partitions. The ability to create partitions with as little as one processor will enable more efficient use of processors, memory and I/O.
- Cluster 1600 support: This feature will allow the p630 Model 6C4 to be supported as a cluster building block by the IBM Cluster 1600, and can optionally be attached to the SP Switch2 technology.

The pSeries 630 will have a strong affinity as a stand-alone departmental server for small and midsize businesses. It will also be deployed as a part of an n-tier application and DBMS Unix server engine in larger

enterprises, predominantly where AIX is already prevalent (distribution, finance, telco, public and industrial sectors). In addition, it now brings IBM's Unix offering into a position of strength for select high-performance computing environments. In fact, IBM's decision to outline the p630 position against the **Hewlett-Packard** (HP) Alphaserver ES45 in the high-performance computing arena suggests that IBM is considering targeting the Alphaserver customer base. While overall systems comparisons are made using the synthetic Linpack benchmarks, the resulting performance advantages for pSeries 630 over the Alphaserver ES45, the previous leader, range from 23 percent to 41 percent running Linpack TPP Mflops (using a four-way processor) vs. running the same benchmark (using a one-way processor), respectively.

For the existing RS/6000 44P Model 270 and pSeries 640-B80 customers, the pSeries 630 provides a compelling upgrade incentive for both tower and rack-mount upgrades, respectively. As one example, the table below gives an indication of the feature/function enhancements comparing desk-side configurations of the RS/6000 44P-Model 270 against the new p630 Model 6E4 desk-side configuration. The combined entry systems price of \$12,500 (minimal configurations), in addition to the self-healing reliability features of this entry server solution, are the most significant aspects encouraging both RS/6000 Model 270 and pSeries 640-B80 customers to consider a technology upgrade.

IBM R/6000 and pSeries Comparison — Entry Systems Comparison

Feature/Function	RS/6000 44P-Model 270 (Desktop)	P630 6E4 (Tower)
Architecture	1-4 way SMP	1-4 way SMP
Processor	375/450MHz Power III	1.0GHz POWER4
Technology	Copper	SOI/Copper
Memory	256-16GB ECC	1GB – 16GB Chipkill DDR
PCI Slots	5 32-bit slots	4 64-bit slots @ 133MHz
Hot Plug PCI	No	Yes
Disk/Media Bays	4 hot-swappable disk/1 media	4 hot-swappable disk/1 media
Integrated Features	Dual 10/100 Ethernet Dual Ultra 2 SCSI	Dual 10/100 Ethernet Dual Ultra 3 SCSI
Chipkill Memory	No	Yes
Dynamic L2, L3, and PCI Slot Deallocation	No	Yes
Static and Dynamic LPAR Support	No	Standard feature (Q402)
Redundant Hot-Plug Power	No	Optional
Redundant Hot-Plug Cooling	No	Optional

Source: IBM and Giga Information Group

To conclude, Giga believes IT clients should take a closer look at the pSeries 630 in the following scenarios:

- p630 should be considered a strong upgrade path for companies currently either using the earlier generation RS/6000 44P Model 270 (refer to table above) or the pSeries 640-B80 technology. For example, the performance range and price/performance improvements over the p640-B80 are compelling. Across rPerf, SPECfp_rate and SPECint_rate benchmark results, the p630 ranges from

26 percent to 77 percent faster than the p640 (at 450MHz) at essentially 41 percent less cost.

- In server consolidation scenarios, LPAR partitioning will give the end user the ability to get more efficient use in applying systems resources to shifting application workload requirements, as well as the ability to run both Linux and AIX applications through running multiple operating images in separate partitions. This will be of equal importance for both the Fortune 1000 and small and midsize business sectors.
- For companies that want to take advantage of IBM's HACMP failover technology, this will be a serious pSeries contender for providing a very low-cost failover server solution.
- Because of its reliability features, and extreme performance capabilities for its price class, the p630 will be equally compelling for the more cost-conscious small and midsize business as both an application server and database server engine.
- In high-performance computing environments, based on initial synthetic benchmark results, the p630 will be an effective solution for both floating point, as well as integer-intensive applications. In addition, it would be effective as a replacement technology for an RS/6000 SP node configuration.

While Giga is encouraged by some of the performance benchmarks IBM has released at the time of the announcement (e.g., Linpack, SPECint_rate, SPECfp_rate, Linpack, SPECweb99 SSL and rPerf), we believe that IBM could consider taking the next step in extending its benchmarking investments to running more application-specific benchmark scenarios (e.g., specific to SAP, Oracle and PeopleSoft, Notes/Domino, to name a few). Since bringing POWER4-based microprocessors to the entry server Unix space creates a new performance scalability threshold in the one- to four-way Unix server arena, applications-specific benchmark characterizations should be higher priority for IBM. Even in this class of entry server, the CTO or systems architect will still focus on this as a core metric in their server selection criteria when considering competitive Unix and Intel server solutions.