Increasing Data Center Energy Efficiency with x86 Servers
Executive Summary

The current economic crisis has most companies scrambling for ways to get the most out of every dollar. The energy needed to power and cool data centers cannot be ignored, as the total energy needed over the life of the server can exceed the cost of systems purchased. RFG believes power will be the number one issue for many IT executives for at least the next ten years. IT executives can increase data center efficiency using blade servers to increase the system performance per watt. This reduces energy costs, while increasing infrastructure reliability and adaptability.

RFG believes IT executives are going to get the best chance of optimizing power, cost, and performance by selecting computing solutions that are designed to synergistically enhance capabilities in these three areas. IBM Corporation has teamed with Intel Corporation to integrate the benefits of energy efficient computing. On the one hand, Intel has added capabilities in its Intel® Xeon® Processor 5500 Series architecture, increasing computational throughput for the same or less power. In addition, its integrated memory management has also improved data throughput for less power.

IBM extended the capabilities of its Intel Xeon Processor 5500 Series System x and BladeCenter offerings. These include improved memory management, adaptive energy management, and better virtualization. For example, HS22 offers outstanding performance, flexible configuration options and simple management in an efficient server designed to run a broad range of workloads. Compared to previous servers, the new IBM BladeCenter HS22 offers 60 percent better price/performance [1]on virtualization and 33 percent better on general business applications. It also offers 50 percent more memory capacity[2] and 12 percent less power[3] used by the processor when fully utilized (50 percent less when idle).

HS22 is backwards compatible with all BladeCenter enterprise and office chassis, including the original BladeCenter E. Those who have a current chassis installed can fill empty slots without replacing hardware or sacrificing performance. IBM also offers powerful management tools such as IBM Systems Director Active Energy Manager™, which allows customers to more fully understand and manage energy use by monitoring, trending and capping actual server power consumption. The new features of the new generation servers, combined with IBM's proven management and automation capabilities, deliver the maximum performance per watt and dollar in the data center.

While Dell and HP will certainly implement solutions with the Intel Xeon Processor 5500 Series architecture, their less efficient chassis and lack of UEFI for more complete remote management will not offer the same compelling value as the IBM/Intel combination.

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[1] **60% price performance is based on SPECint_rate_base projected performance improvements comparing the HS21 using top-bin 3.33GHz 5400-series processors compared to the HS22 top bin 5500-series 2.93GHz processors. Pricing comparison based on standard list price with HS21 using 1 processor and 1GB memory versus HS22 standard list price for mode 7870-C4x, which has 1 processor and 2GB memory.**

[2] **HS21 XM has 8 DIMMs. HS22 has 12 DIMMs. Each blade supports max 8GB memory DIMMs. 12 = 50% more than 8.**

[3] **Intel internal measurements using SPECjbb2005* as of Aug 2007. System configurations: 2S, 80W processors, 8 DIMMs, 1 HDD, 1 PSU. Except Irwindale=110W processors; Power measurements using SPECjbb2005. Tylersburg-EP from Intel internal measurements as of Sept 2008 with 2.93GHz 95W processors This information is preliminary and subject to change before launch.**

Read the full report to learn the advantages of Intel and IBM as a winning combination for Energy Management

With Cisco Systems, Inc.'s recent entry into the blade server market, RFG expects it will take them considerable time to establish the necessary management capabilities to deliver the value IT executives look for in next-generation x86-based blade server architectures.

IBM has the experience, reputation, and performance to effectively design and deliver integrated processor and systems designs for optimal blade systems performance in the data center that will meet future green data center requirements in a cost effective, reliable manner.

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