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## IBM eServer i5 595 and the Virtualization Grand Slam

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*The IBM eServer i5 595 is the latest offering in the iSeries with a level of performance that is unprecedented for an integrated multi workload solution. The i5 595 features the performance of up to sixty-four POWER5 processors and Capacity on Demand (CoD), the flexibility and efficiency of IBM's Virtualization Engine and Hypervisor, support for multiple operating systems including i5/OS, AIX 5L, Linux, and Windows 2003, and the latest release of the integrated xSeries server. The Virtualization Grand Slam Benchmark illustrates the ability of the i5 595 to undertake multiple workloads while providing high levels of utilization and throughput. The i5 595 is an ideal platform for server consolidation and integration with x86-based architecture, while providing a state-of-the-art execution environment with many of the value-added capabilities associated with mainframes.*

### **Sizing Up the i5 595: Data Center Capability with SMB Simplicity**

Market forces and the evolving value chain between the enterprise and its customers, partners, and suppliers require that IT resources be flexible and robust, and respond in real time to the needs of the enterprise as well as its partners and customers. IT must not only support existing applications, but also provide a future proof environment on which to cost-effectively deploy applications as needed while being able to scale over time.

The IBM eServer i5 595 brings the integrated solutions-focused platform to a new scale, and new opportunities. With the capability to host up to sixty-four processors (thirty-two through CoD), the i5 595 is a capable player for the enterprise or data center marketplace. Through the mainframe-inspired technologies including the Virtualization Engine and Hypervisor, this latest eServer is able to consolidate multiple disparate workloads found throughout the enterprise onto a single, centrally managed data center resource. The i5/OS allows users to exploit the value of integrated middleware solutions and lower operational costs by sharing resources through the Virtualization Engine.

The i5 595 is available in two configurations: standard and enterprise. Each features POWER5 1.65GHz processors, and the various configurations scale up to 2TB of memory and up to 190TB of disk storage. A maximum of 254 logical partitions are available, and anywhere from one to all 254 may be configured, with each configured partition having access to the same resources within the system. Compared with the previous generation iSeries 890, the i5 595 offers four times the performance, and eight times the amount of CoD, memory, and supported number of partitions. The i5 595 is designed to help large enterprises develop and manage a highly efficient IT infrastructure by consolidating multiple business units, operating environments, and workloads.

With the continued emphasis from CFOs on cost rationalization throughout the business, IT managers are playing their part by seeking to reduce cost through consolidation and simplification of their IT footprints. The IBM eServer i5 595 offers organizations the opportunity to consolidate, simplify, and lay the groundwork for future expansions while leveraging existing assets, including Intel-based solutions and existing Windows servers. The eServer i5 595 is all about bringing simplicity to the on demand world for even the largest enterprise.

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## Consolidating Multiple Operating Systems onto a Single Integrated Solution

The eServer i5's ability to be dynamically partitioned to support multiple instantiations of OS environments offers IT managers the ability to run Linux, i5/OS, and AIX 5L, as well as Windows (through virtual I/O provided by the POWER Hypervisor technology) all within the context, manageability, and simplicity of a single server. The eServer i5 and its x86-based server integration features provide enterprises with substantial Wintel investments the unique ability to leverage and complement this existing investment while obtaining decreased complexity through workload and server consolidation. The integrated eServer xSeries server provides shared access to tape, DVDs, CD-ROMs, and dynamic virtual disks within the x86 environment. Since most mid-tier and large-scale enterprises operate heterogeneous environments, this multi-OS capability provides a platform to take advantage of the cost savings and network management simplification inherent with infrastructure simplification.

### The Grand Slam Virtualization Benchmark: Seeing is Believing

The purpose of the Virtualization Grand Slam Benchmark is to demonstrate response times under real world scenarios. The benchmark was measured on an eight-way eServer i5 570 with 128GB RAM and 237 35GB disks, and was configured into four partitions virtual Ethernet connections with throughput of about 450MB/sec. The following chart summarizes the application performance and CPU utilization achieved:

Configuration \ Application	PeopleSoft Enterprise One [500 users]	PeopleSoft Enterprise Learning Management [600 users]	Trade3 [1,000 users]	Samba File Serving [25 users]
Standalone two-way, Fixed Partition	Response time: 0.7 second CPU Utilization: 69%	Response time: 3.5 seconds CPU Utilization: 63%	Transactions/second: 66 CPU Utilization: 57%	Throughput: 41MB/second CPU Utilization: 40%
Concurrent two-way, Fixed Partition	Response time: 0.7 second CPU Utilization: 71%	Response time: 3.6 seconds CPU Utilization: 64%	Transactions/second: 66 CPU Utilization: 59%	Throughput: 40MB/second CPU Utilization: 41%
Concurrent two-way, Shared Partition	Response time: 0.4 second CPU Utilization: 73%	Response time: 3.7 seconds CPU Utilization: 70%	Transactions/second: 66 CPU Utilization: 65%	Throughput: 39MB/second CPU Utilization: 43%

While these numbers illustrate a system utilization that would eclipse standard server utilization on Intel or UNIX solutions, what is interesting is not merely the speeds and feeds, but rather that the load being tested on a single server would normally be distributed among multiple servers. Assuming that competitive UNIX solutions can maintain approximately 15% utilization, it would require four or five servers to support this load. For Intel x86-based solutions with typical 5-10% utilization, it would require seven or more servers. Obviously, with larger workloads, the numbers would increase. Thus, in many organizations a single eServer i5 could replace dozens of existing servers with commensurate savings in operational overhead. The eServer i5 offers the potential for both present-day savings and capacity to add centrally managed new applications and operating systems in the future.

### What Does It All Mean?

The eServer i5 595 offers a host of opportunities for enterprises and their data centers. Enterprises seeking to consolidate existing IT footprints may find the eServer i5's support for multiple OS partitions and resource allocations within a highly scalable integrated environment an intriguing solution with demonstrable benefit. The enhancements to CoD with this latest eServer provide a straightforward option to react to spikes in demand with additional computational resources, or to scale IT resources to fit the needs of the business. This multi-OS, multi-workload environment can provide substantial savings in IT operations and a state-of-the-art execution environment.

Whether it is infrastructure simplification or the ability to expand and meet new value chain demands, enterprises will likely find the eServer i5 an ideal way to meet both requirements. The IBM eServer i5 offers solutions for today's IT issues — such as consolidation and simplification — while also providing a stable and extensible foundation for meeting tomorrow's needs. Enterprises seeking a competitive edge in their IT operations are well advised to consider the value proposition offered by the IBM eServer i5.