



IBM Introduces On-Demand Scalability for System i5 520

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Management Summary

The capability to have an unlimited supply of electrical resources does exist, but we have control over that awkward resource in our everyday life. Every time that we turn on a light switch to see or a television set to be entertained, we seem to have access to an unlimited supply of electrical power. We have to pay for the power that we use, but only *after* we use it. We do not have to pay to keep additional electricity in reserve. It is a utility, which seems to provide us with what we need *on demand*. The same is true for our water supply. If we need a glass of water to drink, a quart to make coffee, or several gallons to bathe in, all we have to do is turn the faucet and we seem to have access to an unlimited supply of purified H₂O. We do not have to pay in advance for access to this resource, either. Our supply is available *on demand*. Electricity and water, however, are provided by regulated utilities, controlled by the government to satisfy the needs of the citizenry.

The idea of keeping a pool of resources on hand to provide on demand access for us in other areas also exists, although not without a price and not without the need for overt action to replenish the supply. Home heating oil is a prime example. We keep a tank of oil on hand as an *on demand* resource whenever the thermostat detects a need to request heat from the oil burner. Unfortunately, we must pay the oil company in advance to keep the *on demand* supply in our homes. The oil company, for their part, does the administrative overhead, keeping track of the quantity remaining and delivering more whenever the supply is low, providing us with a virtually-unlimited supply. The tank of gas in our cars is another example of a resource that needs to be replenished. Here the thermostat is replaced by an accelerator, placing an *on demand* call for additional energy. However, the driver is responsible to ensure that there is a sufficient quantity available, with rather dire consequences for not replenishing.

In the world of information technology (IT), the availability of commodity processors has not only lowered the cost of computing, but it has also enabled a high degree of scalability within the compute engine. Symmetrical Multiprocessing (SMP) enables the data center with the capability to add additional processing resources dynamically to the mission-critical servers driving the enterprise. Unfortunately, in many cases, adding compute power is not always dynamic, requiring the acquisition, shipping, installation, and configuration of a CPU resource before it can be put to use. It also can entail costly administrative overhead to complete the implementation. **IBM has simplified that process for the IBM System i5 and i5/OS, providing not only on demand scalability, but also a processing accelerator to take advantage of the scalable resources available for the i5.** To learn more about how the i5 Accelerator can lower the total cost of ownership of your IT resources, please read on.

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Data Center Processing Limitations

No matter what size the enterprise, the 2006 data center is faced with an unenviable task. How can it provide the various executives and line organizations with the processing power required by them in a dynamically-changing business environment? How can the data center staff implement a flexible architecture, capable of doubling its processing capabilities annually, while at the same time protecting the investment made in support of mission-critical applications?

Today's enterprise data center is focused upon providing an industry-specific set of solutions for a wide range of application requirements. Mission-critical order/entry applications with OLTP demands may not require the same operating environment as accounting applications doing billing and payroll. These in turn may not have the same processing and I/O needs as the decision support tools required to forecast enterprise needs for the next five years. Some of these applications have complementary attributes and fit well into a data center server plan that includes a partitionable resource, with I/O-intensive applications making excellent use of available resources on platforms running CPU-intensive applications. Others are not, competing with other applications within the microprocessor for instruction cycles. New, and enhanced, applications are being introduced into the enterprise environment on a weekly basis. When this occurs, additional processing power must be activated immediately to respond to new customer requirements or peak loads, or questions about response time will come raining down upon the heads of data center staff.

Taking inventory of a complex, heterogeneous environment reveals a horizontal environment in which many servers have been acquired to run one specific application and have been carefully sized to satisfy the requirements of that application, taking care not to over-provision the server, wasting valuable enterprise assets. As the demands of growing organizations increase, they often outstrip the capabilities of their initial configuration. In order to minimize costs, some commodity servers running *Windows* or *Linux* were purchased without concern for growth and cannot be scaled. This leads to an environment with too many servers, too many administrators, and a poor total cost of ownership (TCO).

Simplification of these environments requires the implementation of consolidation programs, with a single platform able to support multiple operating systems in a heterogeneous architecture. These programs allow the data center to take

advantage of new technology to create a virtualized environment with complementary and competing applications sharing a common platform. This virtualized environment has the capability of adding additional processors and increasing the processing power of the installed CPUs, preserving the investment and increasing the ROI of modular changes.

The IBM *System i5* is just such a platform, capable of supporting business solutions written for *Windows*, *Linux*, and *AIX*, as well as *i5/OS*. The *i5* is not only available in entry-level configurations supporting mono- and dual-processor POWER5+ platforms for small and medium enterprises (SME), the *i5* can be configured with 64 POWER5 CPUs for the largest enterprise. With POWER5 technology, IBM delivers multi-core, multi-threaded processing to the data center to improve performance and processor efficiency. However, the customers with the greatest requirement for flexibility and scalability, the SMEs, have the fewest resources to enable the management of a dynamic environment. Therefore, IBM has simplified the migration and consolidation processes for easy deployment, along with new capacity on demand (CoD) flexibility, reduced prices for memory and disk, and a new program to enable the data center to add more power to the entry system, dynamically, with a performance *Accelerator*.

i5 Scalability

The *System i5 520* is the ideal server for smaller enterprises with requirements for scalable systems to add web-enablement or groupware solutions to the basic core business applications driving the mission-critical business functions. Available in rack and tower configurations, the mono-processor *i520 Value* and *Express Editions* are now configurable with a single-core version of IBM's POWER5+ microprocessor, running at 1.9 GHz, and are expandable up to 32GB of memory and 39TB of disk, with optional RAID-5 controllers. With up to ten logical partitions (LPARs), with the activation of the *Accelerator*, the single CPU *i520* can utilize fully all of the available system resources to execute core business applications under *i5/OS V5R3* or *V5R4*, *AIX 5L*, or *Linux*. An entry *Value* edition is rated at 600 CPW and lists for \$11,995, with the capability to support 30 5250 CPW¹. (See

¹ CPW is a performance measurement of Commercial Processing Workloads, based upon an internal IBM benchmark using maximum configurations.

Exhibit 1 – i5 Comparison of Selected 520 Models

iSeries/System i5 Model 520	Base System Price	CPW Rating	Max. 5250 Users	Cost/CPW
<i>iSeries 520 Express</i>	\$11,995	500	30	\$23.99
New 2006 Models:				
<i>i520 Express Entry</i>	\$11,995	600	30	\$19.99
<i>i520 Express Entry – with Accelerator activated</i>	\$25,495	3100	30	\$8.22
<i>i520 Express Growth</i>	\$29,900	1200	60	\$24.91
<i>i520 Express Growth - with Accelerator activated</i>	\$34,400	3800	60	\$9.05
<i>i520 Standard Edition 1-way</i>	\$43,400	3800	0	\$11.42
<i>i520 Standard Edition 1/2-way (1 core active for i5/OS, 1CoD)</i>	\$40,000	3800	0	\$10.53
<i>i520 Standard Edition 1/2-way (both cores active for i5/OS)</i>	\$65,800	7100	0	\$9.27

Source: Data from IBM

Exhibit 1, above.) A more configured Express Growth Edition is also available, with a CPW of 1200 and support for 60 5250 workstations. This version starts at \$29,900. With the activation of the *Accelerator for System i5*, for \$13,500, the data center can increase, on-demand, the processing workload capability of the entry model by a factor of five, and by a factor of three for the growth model, improving the CPW rating to 3100/30 and 3800/60, respectively. This enables the enterprise to extend the utilization of the i5 520 server to include groupware, Java, and web applications. The activation is accomplished via transmittal of a software key, with no hardware upgrades or complex commands required.

IBM's new i520 offering represents a significant improvement in price/performance for IBM with the i5. In 2005, a comparable Value Edition with a CPW rating of 500/30 had an entry price of \$8,200, with an upgrade to 2400/60 CPW available for an additional \$24,700. Unfortunately, this upgrade resulted in a change of software tier, increasing the class of the system from a P05 to a P10, with a resulting increase in the software licensing for all applications installed. The 2006 Express editions retain their software class after activation of the Accelerator. **The entry Express Edition remains at a P05 level with the growth**

model staying at a P10 level after the activation of the Accelerator. Also available, but not described herein, are a range of i520 Value Editions, with similar capabilities and pricing to the i520 Express Editions. Only selected models and configurations are shown in Exhibit 1.

The i5 520 is also available in a *Standard Edition*, with multiple models, for mid-sized enterprises required to run multiple e-business solutions. The Standard Edition enables the enterprise to run *Java* and *WebSphere* applications alongside groupware applications such as *IBM Workplace* and *Lotus Domino*. The entry model is a 1-way implementation for \$35,000, with a performance rating of 3800 CPW². This Edition is also available as a 2-way model. Configured with a 2-way CPU, with one active, the i5 520 is priced at \$40,000, with an upgrade to 7100 CPW, by CoD activation, for \$1,800³. The entry software tier is P10, with an upgrade to P20 for the 2-way implementation. The i5 520 also comes in a variety of *Enterprise Editions* with performance ratings of 1200, 2800, 3800, and 7100, with full performance for 5250 applications.

² The Standard Edition does not execute 5250 workloads.

³ IBM charges an additional \$24,000, if you opt to use i5/OS on the second processor.

The i5 lowers the TCO of the IT infrastructure. **By consolidating a virtual plethora of heterogeneous servers into a single platform, the data center can remove complexity, simplify the management of the mission-critical server network, and reduce administrative overhead.** This is based upon the performance/energy efficiency ratio of the POWER5+ micro-processor. System i5 virtual storage can be used to centralize and enhance Windows storage management, including integrating Windows backup applications with i5/OS.

The *i5 570* has also been improved with a simplified product offering to assist in consolidating larger enterprises, using a 16-way server that starts at a dual/quad configuration. A 2-way 570 is rated at 8400 CPW, with a 16-way system capable of 58,500 CPW. An 8-way i570, in fact, outperforms all competitors in the SPECjbb2000 benchmark, measuring Java business applications. The 8-way i5 has been measured at 397,685 operations/second and outdistances servers based upon AMD's *Opteron*, Sun's *SPARC64 V*, and HP's *PA-RISC 8800* architectures.

i5/OS

The i5 is more than just higher performance and better utilization of resources. The newest version of the i5/OS, V5R4, adds new functionality to the enterprise, simplifying both the business-critical and administrative missions of the data center. IBM has historically used the AS/400 and iSeries as an integrated business solutions platform, enabling ISVs with a broad range of open tools to integrate with IBM middleware. In 2005, this innovation led to the adoption of i5 by almost 300 new ISVs, delivering 600 new business solutions to enterprises worldwide. IBM has now added a new set of features to this operating environment to enable the following.

- *Application portability* with a new 32-bit Java Virtual Machine;
- *Improved WebFacing deployment tools* to promote the rapid, cost-effective migration of customized ISV applications;
- *IBM WebSphere Development Studio* to assist in the development of i5/OS applications;
- *Simplification of RPG application deployment* as a Web service; and
- *Improved integration with Microsoft Windows applications* with enhanced ODBC, OLE-DB, and .NET support.

IBM's i5/OS also helps to improve enterprise

security and compliance with integrity protection, network intrusion detection, and auditing enhancements. The data center staff can also reduce the window for backup operations with virtual tape support.

Conclusion

IBM has positioned the i520 as an on-demand platform so that any enterprise can buy into this architecture, within any range, at an attractive price. Any enterprise can acquire a fully-configured system, but only use, and pay for, what they need, up front. When required, the data center can activate the i520's full processing capability by acquiring the appropriate software key.

The i5, however, is not just a platform. Combining IBM's innovative technology and expertise in designing, developing and deploying new on-demand architectures, with an extensive set of business solutions provided by both IBM and a growing network of ISVs, the i5 delivers to the enterprise real solutions for real business problems. Moreover, it does so at multiple levels. At the processor level, IBM is delivering more performance in a lower cost package, enabling the availability of sophisticated business solutions to a large segment of the SME community, who did not believe they could afford them. From an energy conservation level, **the i5 provides more POWER for less power than ever before.** On an administrative level, the i5 simplifies the IT operation of the largest, and smallest, data center, enabling a reduction in data center staffing, as the i5 can also be used to attach and manage *xSeries* servers and *BladeCenter*.

No matter what size enterprise you manage. No matter how much you expect your data center to grow. IBM has a scalable solution for you; a solution to lower your TCO and increase performance, while at the same time protecting the investment that you make today. Before you add even more commodity platforms to your network, check out the i5 from IBM. It may be more than you expected.



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