THE CLIPPER GROUP

Navigator™

IBM BladeCenter 2003 — Update on Promises Made and an Eye to the Horizon

Analyst: David Reine

Management Summary

In November 2002, IBM responded to the demands being placed upon IT organizations around the world to ***do more with less***, with the general availability of the *eServer BladeCenter*. Also designed to ***do it in less time*** with easily installable blades configured with the Intel *Xeon* microprocessors, BladeCenter allowed enterprises to ***do it in less space*** with high-density, energy-efficient computing.

Initial configurations permitted the installation of up to 14 mono- or dual-processor Intel *Xeon* blades in a single 7U BladeCenter chassis, twice the density previously available using the proverbial 1U "pizza box" mounting. A single 42 inch rack was now configurable with up to six BladeCenters, equaling 84 separate blades, positioning the BladeCenter as an affordable consolidation server, capable of running *Windows*, *NetWare* and *Linux* at the same time. Moreover, with budgets more constrained than ever before, IBM enabled the data center to ***do it with fewer resources***, with enhanced manageability functions. Moreover, they promised more. IBM promised flexibility in configuration, with the capability to upgrade to new blade technologies. IBM promised BladeCenter support for a variety of storage options to complement the applications running with BladeCenter. IBM promised SAN. IBM promised NAS. IBM promised innovation. This sums up to a lot of promises from IBM.

In October 2002, we took an early look at BladeCenter in **The Clipper Group Navigator** entitled *IBM BladeCenter – A Glimpse at the Future of Computing*[1]. The title says a lot about our conclusions. Well, with its recent announcements of new BladeCenter capabilities, IBM has moved a little closer to the future, and has made good on a number of its promises. With more than 50,000 blades shipped, the original offering was attractive to many. Now, with the enhancements, there are even more opportunities for deploying BladeCenter on your journey to the future. Read on to find out how and why.

---

[1] See The Clipper Group Navigator dated October 4, 2003, at http://www.clipper.com/research/TCG2002038.pdf.

BladeCenter Introduction - Revisited

In September 2002, IBM announced the *eServer BladeCenter*, a rack-optimized enterprise server that eliminated many of the complications of consolidation with automatic failover components to eliminate single points of failure. A typical server requires significant physical infrastructure, including but not limited to storage, power, fans, cables, console, I/O, switches, etc. **With BladeCenter, IBM developed a high-density drawer capable of installing twice as many servers as before, in the same space, with capabilities to share the physical infrastructure that encumbered previous attempts at scale-out consolidation.** BladeCenter thus became an ideal consolidation platform for any enterprise with a mixed application environment requiring shared infrastructure between enterprise-class servers, networks, storage and applications, such as file/print activities, collaboration, and high-performance computing.

The BladeCenter chassis consists of two separate areas, front and back, connected by a mid-plane that eliminated the vast majority of internal cables, and occupying 7U of rack space. The front section supports 14 separate hot-swappable blades, with each blade capable of supporting either mono- or a dual-processor configuration, with up to two IDE or SCSI disk drives mounted on the blade. The rear section holds the shared infrastructure: power, fans, I/O switches, and management module, reducing the number of components that might fail. **With 14 servers self-contained in a 7U space, enterprises can achieve a significant immediate return in their investment over previous implementations through savings in floor and rack space, reduced power consumption, and lower cooling requirements.** Sharing the infrastructure reduces the incremental cost of another server to the cost of the blade, assuming that the chassis is not full.

In this initial offering, IBM presented a single processor blade, the *HS20*. You could install either a mono-processor or dual-processor *Xeon* microprocessor HS20 Blade operating at 2.0GHz, running Microsoft *Windows,* Novell *NetWare*, or *Linux*. With the BladeCenter chassis designed for versatility and high-availability, it could support a variety of processor blades, with different architectures, different processing speeds, and different operating systems, but no other options were presented at that time. However, the promise was there.

Expanded Processor Support

In order to fulfill the promise of the BladeCenter introduction, IBM has had to continue the development and testing of new server blades, and more options for BladeCenter, to live up to last year's versatility claims. The primary processing component of BladeCenter is the HS20 Blade Server. Introduced with a mono- or dual-processor Xeon microprocessor, it had performance characteristics of from 2.0 to 2.4GHz. The Blade Server now has an entry offering at 2.6GHz, with an entry price of $2K. Each Blade Server can scale-up to a dual-processor Xeon running at 2.80, 3.06, or 3.20GHz. The BladeCenter itself can scale-out to 14 Xeon blades running at 3.20GHz, enabling a significant mix of web services and OLTP applications. In addition to the improvements in the microprocessor speed, IBM has also extended the blade's capability with the addition of 146GB SCSI drives.

However, it was reasonable to suspect that when IBM talked about versatility and a variety of blades, they did not intend to limit BladeCenter improvements just to higher-density, faster Intel processors. **Xeon is nice, but it is a 32-bit architecture and there are other architectures and application environments in IBM's own backyard that also need to be addressed. One of those environments is the 64-bit *Power* architecture running *AIX* and *Linux* applications.**

With over 15,000 AIX applications and an unknown number of Linux applications installed in the *RS/6000* and *pSeries* base, IBM faced a unique fork in the road. They

could develop a new blade for the BladeCenter, a *PowerBlade*, to allow the execution of 64-bit AIX and Linux applications, or ignore this portion of the base in fear of cannibalizing their *pSeries* business. However, because a blade is currently limited to a mono- or dual-processor environment, doing so would clearly not be a threat to the mid-range and high-end pSeries with scale-up capability to 8, 16, and 32 processors. **Moreover, if they did not address the 64-bit Linux application space, someone else would. So, IBM announced the *JS20*, a Power4-based, mono- and dual-processor *PPC970* blade.**

When IBM introduced BladeCenter in 2002, they did so expecting a 70%-30% mix of applications: 70% running Windows and 30% running Linux. That has proven not to be the case. **IBM is experiencing a 65% distribution with Linux applications, almost the inverse of what they expected.** With the PowerBlade, therefore, IBM has decided to introduce Linux first, with follow-on of AIX in 2004.

Targeting the high-performance computing requirements found in bio-informatics and seismic applications, the PowerBlade includes the virtual memory capabilities found in pSeries logical partitioning, which can enhance compute-intensive performance[2]. **With Linux support from SuSE, the PowerBlade enables an easy migration path for customers looking to transition off older platforms and to consolidate on Blade-Center**. Moreover, the infrastructure provided by BladeCenter shares existing external storage and I/O facilities with the Xeon blades, enabling a low-cost, consolidated solution. You will not need to install a separate *pSeries* server such as the *p615*, or similar standalone solution. Now Blade-Center is truly a heterogeneous platform with a low cost Linux/Power solution joining the earlier Intel-based Windows-Linux solutions in a single chassis. It will

take a little while longer to see AIX and other versions of Linux available on the PowerBlade, sometime next year.

What else is in the testing lab to extend the flexibility of BladeCenter? With a 64-bit Power solution available, can a 64-bit x86 solution be far behind? 32-bit Xeon blades will need a complement when 64-bit applications become more prevalent. With 2-way processor blades in production, can 4-way blades be far behind? The availability of 4-way blades, both Xeon and Power, will increase the scale-up, as well as the scale-out flexibility of BladeCenter, to ERP and other scale-up solutions, enabling higher user workloads. There are plenty of additional possibilities for future Blade-Center server blades.

In addition, expect improvements to the infrastructure components of the BladeCenter. These should occur in the area of I/O and interface switches. These include outward connections toward the Internet to increase the security of BladeCenter against improper access, and inward toward the storage, to increase the Fibre Channel throughput for the forthcoming higher density of processors. Don't hold your breath for InfiniBand, however; this one may stay on the drawing board for a while.

The On-Demand BladeCenter

IBM designed BladeCenter to help enterprises reduce their total cost of ownership by adding individual thin servers *on demand* as capacity needs increased. **With this feature, BladeCenter can automatically reconfigure individual blades to add additional processing power to specific applications, as the mission-critical workload increases, removing those cycles from less urgent applications**. In addition, with no tools required, the data center could simply slide a new blade into a pre-configured bay, creating an instant access to additional computing resources.

IBM has now taken that concept one step further with Standby Capacity on Demand, a program that enables the enterprise to *pay as you grow* without any

---

[2] This replicates the capability achieved with VMWare on Xeon.

further installation into the BladeCenter chassis. Configured for *Standby Capacity on Demand*, BladeCenter ships with 14 blades, 7 active and 7 inactive, for reserve computing power. **You pay for the first 7 blades today and defer payment for the remainder until your business growth requires the additional performance.** There is a six-month limit to the deferral. **IBM absorbs the cost of the over-provisioning today to enable the enter-prise with the flexibility to enjoy an uninterrupted upgrade with instant-aneous deployment, whenever required.**

Intelligent Systems Management

The on-demand functionality is delivered through the *IBM Director*, a remote intelligent system management application delivered with BladeCenter. Designed to support a diverse integration, **the Director Console provides autonomic blade management, using a single point of deployment and management for all blades, regardless of architecture.** IBM designed the Director to auto-discover and monitor the status of the chassis, including all of the blades and the infrastructure components. It does this not only to alert the systems administrator whenever a problem arises, but also to initiate corrective action to solve problems before they can disrupt service. It is through Director that BladeCenter enables automated set-up and configuration of the chassis and blades. The Director can reprovision the blades within minutes, without operator assistance. For a complete list of the Director functionality, see Exhibit 1.

Conclusion

In November 2002, IBM introduced The BladeCenter as a consolidation server that changed the server paradigm forever. **BladeCenter not only altered the way IT looks at consolidation servers, it turned the view upside down by introducing the concept of integrated consolidation, enabling blades with different server architectures and different operating systems to co-exist in the same physical**

Exhibit 1 —
IBM Director Functionality

Configuration Management

- Discovery, Setup, Install, Configuration Deployment, Automatic & Dynamic Provisioning

Workgroup Management

- Inventory, Monitoring, Alerting, Group Management, RAID

- Remote Control, File Transfer, Real Time Diagnostics

Director Extensions

- Capacity Manager, Rack Manager, CSM, System Availability, Software Integration

---

platform, sharing a common infra-structure. Combined with the ease of use provided by the intelligent server man-agement in the IBM Director and a continued investment in innovation, IBM has is driving the BladeCenter market by reducing the total cost of ownership for consolidation with a scale-out revolution.

Starting with the Xeon Blade technology developed under partnership with Intel, IBM has exhibited leadership by inserting the PowerBlade into the BladeCenter matrix. Putting a 64-bit Linux server in play in BladeCenter can only increase IBM's position in high-performance computing. **Combining these diverse architectures with the on-demand functionality needed for utility compu-ting and financed for up to six months by IBM to boot, explains why Blade-Center is changing the way many enterprises deploy server technology.**

About The Clipper Group, Inc.

The Clipper Group, Inc., is an independent consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

➢ *The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.*

About the Author

David Reine is a Senior Contributing Analyst for The Clipper Group. Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. He joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and an MBA from Northeastern University.

➢ *Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 30. (Please dial "1-30" when you hear the automated attendant.)*

Regarding Trademarks and Service Marks

The Clipper Group Navigator, **The Clipper Group Explorer**, **The Clipper Group Observer**, **The Clipper Group** *Captain's Log,* and *"clipper.com"* are trademarks of The Clipper Group, Inc., and the clipper ship drawings, *"Navigating Information Technology Horizons"*, and *"teraproductivity"* are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

Disclosure

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.