



## **Providing Choice for the Data Center— Dell Introduces New PowerEdge Blade Solution**

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### **Management Summary**

“One size fits all” is a message that works to simplify the purchase of a T-shirt, but does not help in the purchase of a dress shirt with a neck size too small for the collar button to be closed. It may work for a pair of socks, but not for the shoes. Who is going to buy a pair of “one-size-fits-all” blue jeans? Everyone is different; we have different waist sizes, different hips. The lengths of our legs differ from individual to individual. We need, and we expect, our clothes to fit our custom shapes, even if they are “off-the-rack”. We need a choice of sizes so that we can look good and be comfortable in the clothes that we wear. We even need our electronic toys customized; with personalized cell phone ring tones so that we can identify our calls in a crowded room, and iPods downloaded with customized music to fit our moods.

The failure of “one-size-fits-all” is especially obvious in the workplace where we see enterprise data centers trying to support connections for thousands of users, while the small or medium sized business, the SMB, is trying to support hundreds, or perhaps only tens, of employees. If the “one-size-fits-all” theory were applied here, IBM would indeed be happy, with a mainframe in every enterprise, large or small, that wanted to connect into the electronic age. However, not every enterprise needs a mainframe. For most enterprises, traditional open systems towers or rack-mount servers have provided all of the mission-critical application performance that we need to service their user populations. Unfortunately, the growth of small business over the years has seen a tremendous increase in the number of servers required to complete the mission. Server sprawl has resulted in the need to consolidate our compute resources, both from a physical standpoint, with fewer servers supporting more users, and from a logical standpoint, with virtualization programs allowing us to share a single physical platform between multiple applications. This has led to the introduction, and general acceptance, of blade servers into data centers with requirements for a denser compute environment. Not all data centers have this need, but some definitely do. What all data centers need, however, is choice, the same choice that we have in our personal lives. Dell has recognized this need in their *PowerEdge* family of servers.

In addition to the tower and rack-mount servers that they have been providing for years, Dell is now providing the data center with a brand-new blade alternative, the *PowerEdge M-Series*, to enable the enterprise to lower the total cost of ownership (TCO) of the data center environment and to simplify the rollout of new business solutions for the enterprise. To learn more about the M-Series, please read on.

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## Why Blades in Today's Data Center

Server sprawl is running rampant in data centers of all sizes. For years, enterprises have been rolling out a new server, or a set of servers, for each new application required to satisfy a new business- or mission-critical need. **The majority, if not all, of these systems are running at a utilization rate of less than 20% of their compute capability. Unfortunately, they are running at 100% of their power rating, wasting the electricity necessary to run, and cool the data center, without any means to throttle down the power consumed.** In addition, the data center is also wasting another critical resource, the staff necessary to manage these servers. In order to regain control of the IT infrastructure and reduce the complexity, data center staff everywhere has initiated programs to consolidate the server environment and to virtualize the resulting consolidated servers in order to reduce the TCO of the data center. For the past few years, the focus of this effort has centered on the deployment and installation of blade servers in order to simplify the acquisition, deployment, and management of the data center infrastructure.

Bladed environments provide a variety of benefits to the enterprise, based upon their density, cable requirements (or lack of), and integration. (See Exhibit 1, in the next column, for a partial list of benefits derived from a bladed architecture.) A common theme for each of these benefits is a reduction in cost for the deployment and/or maintenance of a multi-blade environment. There are, however, some inherent costs associated with the rollout of blades. These include the cost of the chassis, itself, and its rack. If less than five servers can satisfy your compute environment, then a more traditional environment, specifically a tower or rack configuration, probably would suffice. This is where choice becomes critical. **Your enterprise cannot afford to deploy the best alternative that your vendor has to offer. You need to deploy an architecture best suited to your enterprise.**

Dell has always offered a variety of *PowerEdge* servers, now in its ninth-generation, in both tower, and 1U, 2U or 4U rack-mount configurations. The choice is yours among one-, two-, and four-socket systems, with Intel *Celeron*, *Pentium*, or *Xeon* microprocessors, or AMD *Opteron* processors. Now, however, Dell can also offer a next-generation bladed solution that can compete with any other tier-1 option, the Dell *PowerEdge*

### Exhibit 1 – Benefits of Blade Servers

- **Density** – The physical orientation of blades within the chassis (vertical) enables a more efficient use of space, enabling the IT staff to deploy a server density greater than that of tower or rack-mounted platforms.
- **Cabling** – Because of a common, shared backplane, multiple servers can share the same physical resources, such as KVM, I/O, power, and management. This reduces the number of cables required by up to 93% resulting in higher reliability, less complexity, and reduced cost.
- **Deployment** – Fewer chassis translate to less time required to configure, deploy, and setup the infrastructure and fewer errors from a less expensive staff.
- **RAS** – By design, blades are configured for hot-swap-ability. They can be replaced by releasing a locking mechanism; no tools or cables are required. They also provide for a simpler I/O component access for maintenance and upgrade.
- **Component Integration** – A blade architecture embeds the I/O switches into the chassis allowing for a higher QoS with lower administrative and management costs.
- **Investment Protection** – Replaceable blades enable the data center to protect the investment made in the chassis, software, and staff whenever an update is required.

*M-Series* modular enclosure and blades.

### The Dell M-Series

Designed to help eliminate server sprawl and to simplify data center operation, the M-Series is the ideal vehicle to assist the IT staff in consolidating the data center architecture. The M-Series addresses the environmental issues surrounding the waste of energy resources, lowering the IT energy budget, while at the same time, providing the enterprise with the flexibility necessary to deliver the highest performance possible for both business- and mission-critical applications. Dell built the M-Series components using their *Energy Smart* technology with low-voltage, high-efficiency processors, “low-flow” fan technology, and high-efficiency power supplies to reduce power consumption, while, at the same time, increasing performance per watt for the data center.

### Exhibit 2 - M-Series FlexIO Options

- **PowerConnect M6220 Switch** – An upgradeable Layer 3 switch with four 1Gb ports and optional upgradeable ports for stacking or 10Gb.
- **Cisco Catalyst Blade Switches** – Three options, enabling the data center to choose between all 1Gb ports, 1Gb ports plus stacking ports, or a combination of 1Gb and 10Gb plus stacking. An InfiniBand switch from Cisco will also be available.
- **Brocade M4424 SAN** – Two 4Gb F.C. options are available: a standard FC4 switch or a low-cost port aggregator with simplified configuration and interoperability.
- **F.C. HBAs** – Two 4Gb F.C. host bus adaptors are available; one from Qlogic, the other from Emulex; and an InfiniBand mezzanine card from Mellanox.
- **Pass Through Options** – To protect the enterprise investment in existing switch infrastructure, Dell provides a pair of pass through options, one for F.C. and one for Ethernet, including a module that can run at 10/100.1,000Mb per second.

Source: Dell

They also incorporated their *FlexIO* technology to include a wide variety of potential communications protocols.

Dell's M-Series blade solution is focused around the 10U *M1000e* blade enclosure that is optimized for the energy-efficient *M600* and *M605* server blades, and a broad selection of I/O adaptors (see Exhibit 2, above) to provide the IT staff with the most advanced flexibility for processing and connectivity options available. With up to 16 blade slots and six I/O bays, all with snap-in scalability, the *M1000e* helps to consolidate the data center with 60% more density than with standard 1U rack-mounted servers. Dell also provides a wide variety of external storage options. (See Exhibit 3, on the next page.)

#### PowerEdge M-Series Components

**PowerEdge M1000e Enclosure** – Dell designed the *M1000e* enclosure to reverse the trend toward data center sprawl and complexity. It is flexible and scalable with snap-in slots for simplified scalability for up to 16 M-Series blade servers, not just today's *M600* and *M605*, but tomorrow's blade technology as well. Dell incorporated enhanced power and cooling tech-

niques along with a high-speed I/O subsystem, including six I/O bays for a heterogeneous, simplified communications capability. With Energy Smart technology, it can lower operating costs and deliver better performance per watt than its competition through thermal design efficiencies such as ultra-efficient power supplies and dynamic fans with optimized airflow design. The *M1000e* comes with *Chassis Management Controllers* for enclosure and blade management and is integrated with Dell's *OpenManage*<sup>1</sup> software and the *Altiris Deployment Solution*. This enables a single controller to manage 16 servers, rather than the 16 controllers required in a rack setup. The enclosure has a list cost of \$5,999, with the blade servers starting at \$1,849.

- **PowerEdge M600 Blade Server** – The *M600* is a two-socket, dual-or quad-core server blade based upon Intel's *Xeon 5000* processor, with support for the entire 5000 series, including the low-voltage *5148* at 2.33GHz and the high-performance *5400* at 3.16GHz. The *M600* supports up to 32GB of memory and up to two 2.5" SAS or SATA drives. The *M600* supports Microsoft *Windows*, *Red Hat Linux*, *SUSE Linux*, and *VMware ESX*.
- **PowerEdge M605 Blade Server** – The *M605* is a two-socket, dual-core<sup>2</sup> server blade based upon AMD's *Opteron 2000 Series* processor, with support for the 2200 series, including the 68-Watt low-voltage *2214HE* at 2.2GHz and the high-performance *2222* at 3.0GHz. The *M605* also supports up to 32GB of memory and up to two 2.5" SAS or SATA drives. The *M605* supports Microsoft *Windows*, *Red Hat Linux*, *SUSE Linux*, and *VMware ESX*.

#### PowerEdge Server Performance

As can be seen above, Dell incorporates open systems server technology into their blade servers with solutions based upon both AMD and Intel technology, just like everyone else! However, the performance of the M-Series stands out from the competition in some very well defined ways. For example, Principled Technologies, an independent research firm, used the *SPECjbb-2005* benchmark and maximum configurations. They determined that the M-Series with *M600* blades achieved up to 25% better performance

<sup>1</sup> See [The Clipper Group Navigator](#) dated February 7, 2008, entitled *Dell Offers Simplified I.T. Management – "Have I.T. Your Way"*, which is available at <http://www.clipper.com/research/TCG2008006pdf>.

<sup>2</sup> Dell already has plans in place to support the quad-core 2300 family, when that processor becomes available.

**Exhibit 3 –****M-series External Storage Options**

- **Dell MD3000i** – Entry-level iSCSI storage for up to 15TB with 1TB SATA drives.
- **Dell AX4-5** – Mid-level storage capability for iSCSI or F.C. networks with support for up to 60 SATA drives and connectivity to up to 64 hosts.
- **Dell EqualLogic PS5000** – This recently announced array, resulting from the acquisition of EqualLogic by Dell, supports up to 192 SAS/SATA devices, with connections for up to 512 hosts on an iSCSI SAN.
- **Dell/EMC CX3-xx** – This high-end array supports up to 480 SATA devices with connectivity for up to 256 SAN-attached hosts.
- **Dell PowerVault NX1950** – This is an integrated NAS solution, or gateway, with a maximum internal capacity of 15TB using SATA drives.

Source: Dell

per watt, when compared to the HP *BladeSystem c-Class* and up to 28% better performance per watt, when compared to IBM's *BladeCenter H*<sup>3</sup>. In terms of energy alone, the Dell M-Series uses 19% less power than the *BladeSystem c-Class* and 12% less energy than the *BladeCenter H*. ***Energy Smart, indeed!***

***M-Series Deployment Experience***

Because Dell ships the M-Series pre-built and tested from the factory, deployment is simplified. Dell commissioned Principled Technologies to compare the installation experience for the same three blade environments: Dell, HP, and IBM. Their report<sup>4</sup> indicated that it took them a about 14 minutes to install an M600 Blade System, while it required over 3 hours and 13 minutes to install the HP *BladeSystem* and almost 2 hours for IBM's *BladeCenter H*. That difference in time and effort is significant, indicating the time that Dell has invested in this new platform will help to lower data center TCO from day 1.

<sup>3</sup> Based upon Principled Technologies' "SPECjbb2005 performance and power consumption on Dell, HP, and IBM blade servers" test report, December 2007.

<sup>4</sup> Based upon Principled Technologies' "Out-of-box comparison between Dell, HP, and IBM blade servers" test report, December 2007.

**The New Dell Server Line-Up**

However, not every SMB data center needs a blade solution. Some can exist quite nicely with one or two towers or rack-mounted systems. For these clients, Dell has recently announced a set of new solutions: The Dell *PowerEdge T105* tower and the Dell *PowerEdge R200* and *R900* rack-mounted servers. The T105 is a one-socket server based on the AMD Opteron 1000 series at 2.8GHz (or an AMD *Sempron LE1250* at 2.2 GHz). With 8GB of memory and 1.5TB of internal storage, the T105 serves as an ideal stand-alone entry-level system.

The R200 is a one-socket rack server with an Intel microprocessor, Xeon, Core 2 Duo, Pentium or Celeron. With up to 8GB of memory and 1.5TB of internal storage, the R200 is an ideal rack-mounted entry-level system. The R900 is a highly scalable 4-socket, 4U rack server to support quad-core Intel *Xeon 7300* processors. With up to 128GB of memory and eight SAS drive bays, the R900 provides the data center with a perfect platform to simplify the IT and consolidate multiple servers, using VMware to virtualize the environment.

**Conclusion**

Although the Dell *PowerEdge 1955 Blade* remains an actively supported product in the Dell lineup, we view Dell's announcement of the M-Series as a reentry into the blade marketplace, in fact, a very loud reentry. With a platform loaded with innovative technology, including thirty patents on the M1000e enclosure alone, Dell is introducing a blade on the cutting edge, not just a me-too product that depends on economy of scale for success. Dell has put a lot of effort into developing an energy-efficient, scalable blade platform that can help the IT staff simplify data center operation while delivering the highest performing open systems blade servers.

The M-Series provides the *PowerEdge* family with an ideal complement to Dell's broad array of open systems tower and rack servers. It is up to the IT staff to determine which format is right for its environment, not Dell. The enterprise does not have to blade everything, just the right things. If your enterprise is ready for a blade architecture, look at the M-Series – it may be ready for you.





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