



Dell Standardizes for Grid Computing and Partners for Enterprise Simplification

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Management Summary

As the winter snows begin to melt and the temperature starts to climb, the first signs of spring begin to appear - *Spring Training*, that is. Baseball has returned and all is right with the world – as long as your team has the right mix of hitting, pitching, and fielding. When it doesn't management has to find the missing pieces to ensure success on the field and in the stands, after all, baseball is a business and winning games leads to success at the box office. If any one piece of the puzzle is missing, the general manager might promote an inexpensive young player or older veteran with a specific talent from the minor leagues for a quick fix, or recruit a more expensive free agent, who has already achieved some measure of success. It is all a matter of time and money. If you are not in a rush, you can develop inexpensive talent slowly. If your fans, and management, demand immediate success, then you must reach deep into your pockets and pay for best player available, who has the specific skills that your team needs. In the business world, however, there are times when it does not make sense to buy the right component to make your products better. Sometimes, you have to acquire the entire company. Often, however, you must form a partnership.

We have seen many acquisitions, recently, in the IT community, where large entities attempt to solve the evolving needs of their customers, caught in a changing landscape. Companies such as IBM, HP, and EMC have been buying up smaller, single-product start-ups, similar to a big-league team acquiring a relief pitcher or a pinch-hitter, to fill a gap, to make a quick fix. Acquisition enables control. The buyer can redirect engineering or redeploy sales, tailoring the acquisition to suit its requirements. Soon the acquired company loses its identity as its brand disappears. There are other times when the pieces that need to be put together come from equals, companies with strong identities and solid product sets. In such cases, enterprises look to form partnerships among equals where each gains from the marriage while retaining its own identity.

As server technology evolves, we see a transition from a big-box, scale-up architecture to a more distributed scale-out environment where applications share resources in a grid computing architecture. This type of solution requires a tight integration between the server and storage hardware, the operating system, and the application database. Companies such as Dell, EMC, Microsoft, and Oracle are clearly leaders in each of these fields. To learn how Dell has blended its technology in partnership with *Windows Server 2003* and *Oracle 10g* to simplify the deployment of your mission-critical applications, please read on.

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Data Center Scale-Out Requirements

The performance of mission-critical applications has been, is, and always will be the measuring stick of a job well done for any CIO. Today, however, it is not the only factor that goes into his or her performance review. Control of the bottom line is a key ingredient of the CIO's job description and that involves controlling the total cost of ownership (TCO) of the IT infrastructure. The development and rollout of mission-critical database applications is a major ingredient in that calculation. (See Exhibit 1, for a list of IT challenges.)

Two of the factors that go into that calculation are capacity planning and management of growth. In order to grow any enterprise and maintain control over costs requires a flexible, scalable server, storage, and network infrastructure. It also requires the on-demand provisioning of resources to applications anywhere in the network, in a flexible, scalable environment, whenever these applications are in need. These additional resources include processing power, memory, and storage.

In many larger enterprises, mission-critical applications historically have been implemented on a scale-up, symmetrical multi-processing (SMP) server, usually running under a variant of the UNIX operating system, such as IBM's *AIX*, HP's *HP-UX*, or Sun's *Solaris*. A typical SMP platform would also include one of the tier-1 high performance RISC engines such as IBM's *POWER*, HP's *HP-PA*, or Sun's *SPARC* families. Recently, we have also seen a Linux variant, such as Red Hat or SuSE, being deployed. All of these platforms also are distinguished by their high degree of reliability, availability, and serviceability (RAS), not to mention their hefty price tags

Enterprise CFOs would have loved to implement their data center infrastructure on a less expensive, commodity platform based on an Intel x86 architecture. However, memory and performance limitations have been a problem. The 32-bit x86 servers simply did not have the throughput or the address space required for high-end ERP or database solutions. The leading database applications, for example - Oracle, did not scale well with

Exhibit 1 – IT Challenges

- **Improve mission-critical application performance** – The CIO needs to satisfy the increasing IT demands of executives and staff, alike;
- **Lower the TCO** – The enterprise needs to reduce the cost of running the data center by minimizing downtime and simplifying system deployment;
- **Improve the quality of service** – The data center needs to be able to set reliable service levels for the enterprise with fast response times;
- **Mitigate risk** – The data center needs to expedite maintenance and support processes; and
- **Manage growth** – The enterprise needs scalable systems with centralized management to facilitate expansion.

large user populations. This had always been a serious problem and limited the deployment of these platforms.

With the widespread availability of commodity 64-bit processors from Intel and AMD, along with the recent acceptance of dual-core processors, data centers can now employ low-cost, high-performance, rack-mounted servers as building blocks in a *scale out* infrastructure. This allows the enterprise to manage growth at the same time it mitigates risk. Combined with modular storage facilities, in both SAN and NAS environments, the enterprise has the components it needs to implement a consolidated data center. The pieces are also there to network remote offices into this architecture. Unfortunately, implementation costs to deploy a unique multi-tier solution configured for the migration of data for information lifecycle management (ILM) and on-demand resource allocation can still drive the TCO beyond the reach of the average enterprise. This does not even address the problems of management created by a distributed network. To do all of that, the data center must implement an *integrated enterprise grid computing environment*.

MegaGrid Solution

What is a Grid and how does the average enterprise deploy one? A grid is a computing solution based upon standard components to facilitate the implementation of a heterogeneous set of applications with the flexibility to migrate from one node to another to utilize fully the processing capability of all nodes in the network. In addition, a grid will support the distribution of data to any storage device within the network regardless of location. In fact, a well-implemented grid will have a variety of high-capacity *and* high-performance storage devices to facilitate the implementation of an ILM environment that matches the value of the device to the value of the data.

Moving toward a grid environment today and away from a traditional scale-up architecture can be accomplished with a rapid return on investment if the data center concentrates on three basic IT tenets.

- Standardize – on cost effective, commodity platforms, both server and storage, to simplify the deployment and promote a no-single-point-of-failure architecture;
- Consolidate – to remove complexity from the mission-critical application environment and minimize management staff; and
- Automate – to simplify the deployment and maintenance of server, storage, and database management components.

Together these can lead to lowering the TCO of the data center if you can find a single integrated solution

A little over a year ago, four companies – Dell, EMC, Intel, and Oracle – formed a partnership designed to combine certain core technologies and technical resources to establish a single, certified set of deployment practices, in order to accelerate customer access to grid computing. This developed into a complete enterprise grid computing solution that outperforms traditional SMP offerings at a fraction of the cost. That effort resulted in a project named *MegaGrid*.

The initial phase of Project MegaGrid was focused on designing, testing, and documenting industry standard best practices for building effective enterprise grid computing infrastructures taking into account cost and

performance requirements. These practices also included conducting a series of tests for scalability, performance, and manageability of a comprehensive database, server, and networked storage configuration.

Last September, Dell expanded the partnership to include Microsoft, transitioning MegaGrid lessons learned from only a Linux base to Linux or *Windows*, providing a solution for customers looking for an affordable, highly available database for Microsoft Windows Server environments. This enabled application deployment on a low cost, tested, and validated server, software, and storage configuration, along with comprehensive implementation services, with a Dell-validated solution stack. It also enabled a more rapid deployment of grid solutions, since Oracle is strongly committed to delivering superior performance and comprehensive enterprise solutions for organizations that utilize Windows-based systems and Windows Server System/.NET Server products. Microsoft Windows has been a primary development platform for Oracle since 1993.

Dell's Implementation

Mid-sized organizations and enterprises can now acquire an integrated, low-cost grid solution from a single source, Dell. For mid-sized enterprises, Dell utilizes the key entry-level building blocks of a grid-computing infrastructure: *Oracle Database 10g Standard Edition* and *Oracle Real Application Clusters* tested and validated with *Microsoft Windows Server 2003 Standard Edition* on a multi-node Oracle cluster of Dell *PowerEdge* servers based upon Intel *Xeon* processors and Dell/EMC *CLARiiON* storage. For larger enterprises, Dell now takes advantage of the recently validated 64-bit implementation, *Oracle Database 10g Release 2 Enterprise Edition with Real Application Clusters on Windows Server 2003 Enterprise x64 Edition*.

Dell has evolved the PowerEdge¹ platform rapidly over the past year. First, they implemented Intel's *EM64T*, enabling both 32-bit and 64-bit computing, improved performance,

¹ See **The Clipper Group Navigator** dated September 27, 2005, entitled *Dual-Core Xeon Arrives – Dell Leads the Charge -- Again*, available at <http://www.clipper.com/research/TCG2005059.pdf>.

Exhibit 2 – PowerEdge Configurations

- **SCI425** – 1U server with up to 2 Intel Xeon processors at up to 3.8GHz, 2MB of L2 cache, and 16GB of ECC DDR-2 SDRAM;
- **PE1850** – 1U server with up to 2 mono- or dual-core processors at up to 3.8GHz, 2MB of L2 cache, and 16GB of ECC DDR-2 SDRAM;
- **PE2850** – 2U server with up to 2 mono- or dual-core processors at up to 3.8GHz, 2MB of L2 cache, and 16GB of ECC DDR-2 SDRAM; and
- **PE6850** – 4U server with up to 4 mono- or dual-core processors at up to 3.66 GHz, 2MB of L2 cache, and 64GB of ECC DDR-2 SDRAM

Source: Dell

and greater flexibility with a larger, addressable database space. Now, Dell has moved to the dual-core version of Xeon to provide even more performance with lower recurring cost, as a result of the economies achieved due to the energy efficient processor. PowerEdge operates equally well in either 32-bit or 64-bit mode, with faster processors, up to 3.8GHz, and up to 2MB of L2 cache². In addition, the Dell MegaGrid solution may be configured with a Dell/EMC AX100 or CX RAID array.

The integration of the Oracle Database 10g Standard Edition and Oracle Real Application Cluster on the PowerEdge platform enables the enterprise to run custom applications unchanged in a cluster, eliminating underutilized standby system costs, reducing unplanned downtime, and improving user service and application availability levels. Dell also provides proof of concept and implementation services for system installation and configuration as part of the MegaGrid acquisition. With mono-, dual-, and quad-processor nodes to choose from in 1U, 2U, and 4U formats (see Exhibit 2, above), the average user will be well advised to avail themselves of these services in order to avoid the perils of

over-provisioning. Dell also provides a single point of contact to resolve any issues relating to the hardware, software, or operating system, eliminating the finger pointing that is sure to arise in environments assembled on the fly. In addition, through the fixed fee *Oracle 10g – Accelerator*, Dell provides cooperative database services with Oracle consulting to rapidly migrate and manage an Oracle Grid environment with Grid Control. As a result, Dell can deliver a seamless management that can significantly reduce complexity.

Conclusion

In business, time is money. Whenever and wherever you can save time, you can dramatically decrease your TCO, thus increasing your bottom line. Dell has recognized the verity in this statement and taken the steps necessary to collaborate with EMC, Intel, Microsoft, and Oracle to provide an integrated grid environment for your data center. By enabling automatic deployment of new applications, and updates to older solutions, and implementing a simplified maintenance for your IT architecture, Dell has provided the framework for your staff to save time, and your enterprise to save money, that would have been wasted in under-utilized and over-provisioned servers and storage.

By enabling a scalable architecture, Dell has empowered a scalable enterprise, one that can improve the IT ROI and lower the total cost of ownership of your data center. By integrating these building blocks for you, Dell has removed complexity from your data center, providing your staff with a single source for not only acquisition, but also service and support, eliminating the finger pointing, and reducing costly downtime. If you believe that this can help your enterprise, check out Dell's MegaGrid solution, it may improve your profitability picture as well.



²The Oracle database runs much better in 64-bit environments, which provide a larger address space.

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