

## Dell™ blade, storage and network solutions Lower cost database performance



When building a datacenter for your organization, you need the ability to balance cost, density, and performance for the most effective solution for your environment. Decisions you make now can cost or save you a great deal of capital over only a few years through reduction of data center space, power usage, and application licensing. For that reason, it's key to ensure that you choose the right Dell blade, storage, and network solution for your database infrastructure, one that allows you to get the most value out of your organization's valuable resources.

Principled Technologies evaluated three Dell blade solutions in three scenarios that highlighted each solution's individual strengths. We looked at density performance for the quarter-height Dell PowerEdge M420 paired with an EqualLogic PS6110XS 10GbE iSCSI SAN array, performance-per-watt for the half-height Dell PowerEdge M520 paired with EqualLogic PS-M4110 blade arrays, and license cost efficiency for the full-height Dell PowerEdge M820 paired with a Compellent SC8000 SAN.

## Increase density with the Dell PowerEdge M420 blade server

The Dell PowerEdge M420 is a compact quarter-height blade solution that allows a doubling of physical server nodes within your blade chassis over standard half-height server blades. The M420 has a major advantage for those with existing Dell infrastructures seeking to increase computational density. The PowerEdge M420 integrates with your existing Dell PowerEdge M1000e blade enclosures, and can use the existing power, cabling, and I/O infrastructure already in place to double your server density for your Oracle® Database 11g R2, Microsoft® SQL Server®, or other databases.

Powered by the Intel® Xeon® processor E5-2400-series in a dual-socket configuration, the PowerEdge M420 can populate a 10U chassis with 512 cores of computing power and 6TB of DDR3 RAM.

To match this level of processing density, we tested using an EqualLogic PS6110XS 10GbE iSCSI SAN array. The PS6110XS is an enterprise-class iSCSI SAN solution that provides the power and speed of SSD storage alongside the capacity advantages of SAS storage.

We connected the components of the solution with Dell Force10 MXL 10/40GbE switches, capable of 1, 10, or 40GbE connections, with FlexIO support for QSFP+, SFP+, or 10GbE copper.

In our testing, we found that two Dell PowerEdge M420 nodes were capable of delivering solid performance, an impressive 436,661 database orders per minute when running Microsoft SQL Server 2012.

For more information about our testing with the Dell PowerEdge M420 blade server, see our full reports:

- [http://www.principledtechnologies.com/clients/reports/Dell/M420\\_database\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M420_database_0912.pdf)
- [http://www.principledtechnologies.com/clients/reports/Dell/M420\\_SQLServer\\_refarch\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M420_SQLServer_refarch_0912.pdf)
- [http://www.principledtechnologies.com/clients/reports/Dell/M420\\_Oracle\\_refarch\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M420_Oracle_refarch_0912.pdf)

## Increase performance-power efficiency with the Dell PowerEdge M520 blade server

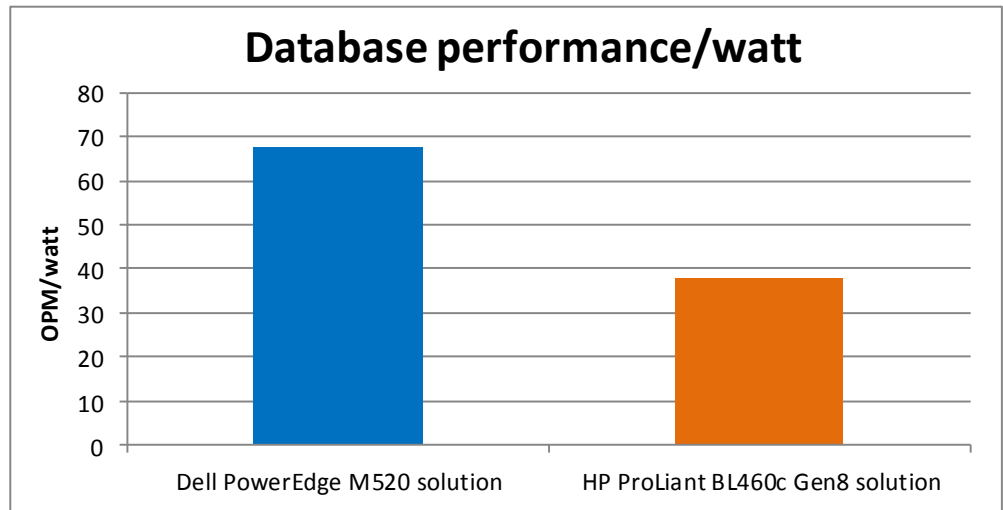
The Dell PowerEdge M520, a half-height blade server solution, has features optimized for performance, density, and energy efficiency, which could lower your energy costs for your database servers. Powered by the Intel Xeon processor E5-2400 series, the PowerEdge M520 supports two processors with up to eight cores each, and up to 384GB of DDR3 RAM across 12 DIMM slots.

We used EqualLogic PS-M4110 blade arrays, which integrate directly into the Dell PowerEdge M1000e blade chassis to provide a compact, robust, self-contained

server, storage, and network core solution. We connected the components of the solution with Dell Force10 MXL 10/40GbE switches, capable of 1, 10, or 40GbE connections, with FlexIO support for QSFP+, SFP+, or 10GbE copper.

In our tests, we examined a Dell PowerEdge M520 solution against an HP ProLiant BL460c Gen8 server solution with Microsoft SQL Server 2012, and found that the Dell solution handled 79.9 percent more orders per minute (OPM) per watt of power consumed than the HP solution (see Figure 1), and increased overall database performance by 113.5 percent.

**Figure 1: The Dell PowerEdge M520 solution handled 79.9 percent more OPM per watt than the HP ProLiant BL460c Gen8 solution.**



For more information about our testing with the Dell PowerEdge M520 blade server, see our full report at [http://www.principledtechnologies.com/clients/reports/Dell/M520\\_vs\\_BL460cG8\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M520_vs_BL460cG8_0912.pdf).

## Increase licensing savings with the Dell PowerEdge M820 blade server

The full-height, 32-core Dell PowerEdge M820 blade server, which can support up to 1.5 TB of RAM, is ideal for those seeking a powerful four-socket server that utilizes fewer cores than other four-socket servers. Powered by the Intel Xeon processor E5-4600 series, the M820 is designed for large-scale enterprise workloads. By selecting a high-performing server that uses fewer cores, your organization could benefit from significantly reduced licensing costs for applications that license per core, including Microsoft® SQL Server® 2012 and Oracle® Database 11g R2.

For storage, we used two Dell Compellent SC8000 controllers, which are capable of supporting SAS, SSD, NL-SAS, Fibre Channel, or SATA technologies. We used Dell PowerConnect M8428-k converged 10GbE switches to provide connections to the SAN.

In our tests, we found that the 32-core Dell PowerEdge M820 increased performance over a 40-core HP ProLiant BL680c G7 while dramatically reducing

database application licensing costs: from \$96,236 for SQL Server, and up to \$315,400 for Oracle Database 11g R2 (see Figures 2 and 3).

	Cost per 2-core pack	1x 32-core Dell PowerEdge M820	1x 40-core HP ProLiant BL680c G7	Dell PowerEdge M820 savings
Number SQL Server 2012 Enterprise Edition 2-core packs needed per server	N/A	16	20	4
SQL Server 2012 Enterprise Edition license cost for all server cores	\$13,748	\$219,968	\$274,960	\$54,992
Three-year cost for Software Assurance	\$10,311	\$164,976	\$206,220	\$41,244
Three-year cost for licenses and Software Assurance	\$24,059	\$384,944	\$481,180	\$96,236

Figure 2: Three-year SQL Server 2012 Enterprise Edition software savings for 32-core Dell PowerEdge M820 server vs. a 40-core server using prices for Microsoft Open Licensing program at the No Level pricing level.

	Cost per processor license	16 licenses for 1x 32-core Dell PowerEdge M820	20 licenses for 1x 40-core HP ProLiant BL680c G7	Dell PowerEdge M820 savings
Number of Oracle Database 11g R2 licenses needed per server	N/A	16	20	4
Oracle Database 11g R2 Enterprise Edition license cost for all server cores	\$47,500.00	\$760,000.00	\$950,000.00	\$190,000.00
Three-year cost for SaS	\$31,350.00	\$501,600.00	\$627,000.00	\$125,400.00
Three-year cost for licenses and SaS	\$78,850.00	\$1,261,600.00	\$1,577,000.00	\$315,400.00

Figure 3: Three-year Oracle Database 11g R2 Enterprise Edition software savings for a 32-core Dell PowerEdge M820 server vs. a 40-core server using prices in US dollars from the Oracle Technology Global Price List.

For more information about our testing with the Dell PowerEdge M820 blade server, see our full SQL Server 2012 report at [http://www.principledtechnologies.com/clients/reports/Dell/M820\\_SQLServer\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M820_SQLServer_0912.pdf), and our full Oracle Database 11g R2 report at [http://www.principledtechnologies.com/clients/reports/Dell/M820\\_Oracle\\_0912.pdf](http://www.principledtechnologies.com/clients/reports/Dell/M820_Oracle_0912.pdf).

## CONCLUSION

Reducing database server costs intelligently without compromising performance is a goal for every IT department. Dell offers a wide range of blade, storage, and network solutions that help achieve those goals by increasing blade server density, increasing performance-per-watt efficiencies, and cutting licensing fees, all while delivering increased performance and high reliability for heavy-demand database applications.

## ABOUT PRINCIPLED TECHNOLOGIES



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Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

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