



# HP ProLiant BL480c breaks world record with 300GB TPC-H performance benchmark result of 40,411QphH using Oracle 10g, Red Hat Linux



The HP ProLiant BL480c server blade is the industry's only two-processor server blade that offers 12 DIMMs, four hot-plug SAS or SATA drives, and three PCI-Express I/O expansion slots.

## Key results at a glance:

- ▣ The HP ProLiant BL480c topped all other cluster competitors in the 300GB TPC-H performance benchmark with 40,411QphH.
- ▣ The results prove ProLiant leadership over major competitors Dell with its PowerEdge 6800 and IBM with its eServer 325 and OpenPower 720.
- ▣ With this benchmark, HP can now claim #1 overall performance results for 100GB TPC-H, 300GB TPC-H, 1,000GB TPC-H, and 3,000GB TPC-H benchmarks.

HP, a market leader for industry-standard servers, announced on December 18, 2006, a new result for the TPC-H @ 300GB performance benchmark that demonstrates the ultimate performance leadership of HP BladeSystem c-Class server blades. Eight two-socket HP ProLiant BL480c server blades clustered using HP 4X DDR Infiniband technology, running Oracle Database 10g release2 Enterprise Edition and Red Hat Enterprise Linux 4, performed at 40,411QphH @ 300GB, 18.67 US \$ per QphH@300GB.

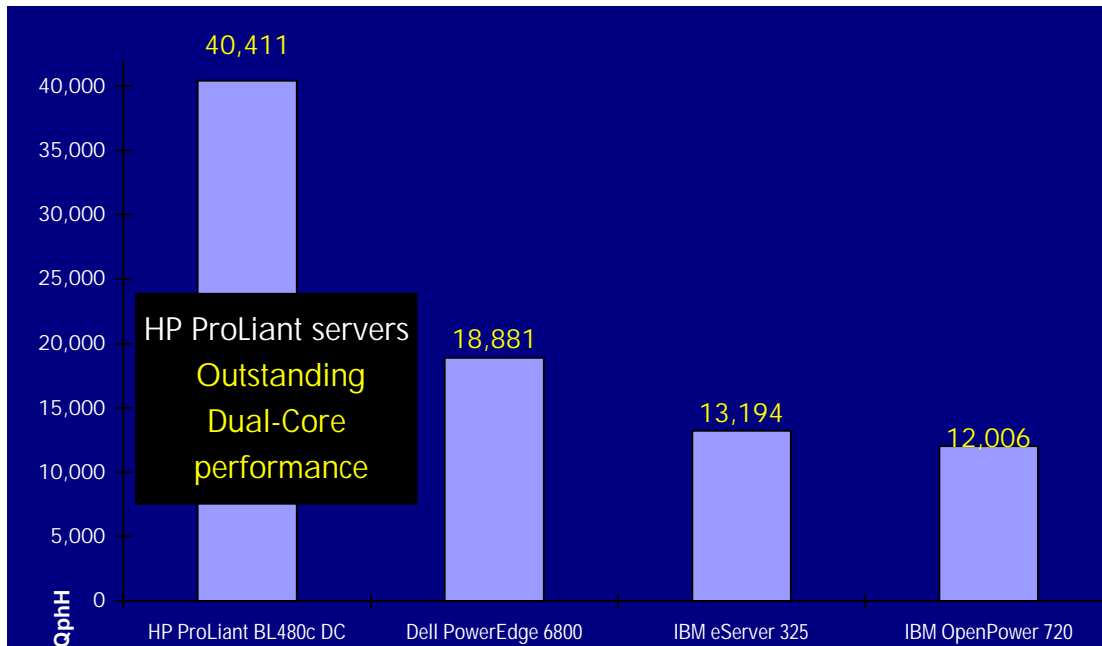


Figure 1. Comparison of performance results of the HP ProLiant BL480c Dual-Core clustered server vs. Dell and IBM clustered competitors on the TPC-H benchmark.

With the HP ProLiant BL480c result on the 300GB TPC-H Benchmark, HP owns six out of the Top Ten spots for top performance leadership.

More information about all servers can be found at the following Web page: <http://www.tpc.org>. Results as of 2-02-07.

## ProLiant server configurations

Eight ProLiant BL480c server blades clustered using HP 4X DDR Infiniband technology were configured with 16 Dual-Core Intel Xeon 5160 (3.0GHz, 4MB L2 Cache, 1333MHz FSB) processors (16 processors/32 cores/32 threads) and 128GB memory (16GB memory per node.) The servers used 2 x 36GB 10K HP Small Form Factor SAS disk drives for OS. The Storage Area Network (SAN) consisted of 4 x Brocade 4Gb SAN Switch for HP c-Class BladeSystem, 32 HP StorageWorks MSA1000 Enclosures with a total of 448 x 36GB 15K Ultra320 disk drives.

## ProLiant BL480c clustered server leads competitors

Table 1. Results of Clustered 300GB TPC-H Benchmark Results

System	QphH	Price/QphH	Availability	Database	OS
HP BladeSystem ProLiant BL480c DC	40,411	18.67 US \$	12/18/06	Oracle Database 10g R2 Enterprise Edition	Red Hat Enterprise Linux 4
Dell PowerEdge 6800	18,881	24.37 US \$	04/24/06	Oracle Database 10g R2 Enterprise Edition w/Partitioning	Red Hat Enterprise Linux AS 3
HP BladeSystem ProLiant BL25p DC	18,725	27.97 US \$	11/11/05	Oracle 10g Enterprise Edition R2 w/ Partitioning	Red Hat Enterprise Linux 4 ES
HP BladeSystem ProLiant BL25p	13,284	34.20 US \$	10/31/05	Oracle Database 10g R2 Enterprise Edition	Red Hat Enterprise Linux 4 ES
IBM eServer 325	13,194	65.44 US \$	11/08/03	IBM DB2 UDB 8.1	SuSE Linux Enterprise Server 8
IBM eServer OpenPower 720	12,006	40.32 US \$	01/14/05	IBM DB2 UDB 8.2	SuSE Linux Enterprise Server 9
Dell PowerEdge 6800	11,742	21.84 US \$	01/08/06	Oracle 10G R2 Enterprise Edition w/Rack and Partitioning	Red Hat Linux AS 3.0

### Interpreting the results

The ProLiant BL480c accomplished the following superior performance deltas vs. its competitors:

- Defeated the 4P Dell PowerEdge 6800 rack server in a two node cluster configured with Dual-Core MP Intel Xeon 3.0GHz processors: More than 2X the performance, at 23% less price/QphH!
- Bested the 2P IBM eServer 325 rack server in an eight node cluster configured with AMD Opteron 2.0GHz (Model 246) processors: More than 3X the performance, at 71% less price/QphH!

## The HP ProLiant Advantage

### HP ProLiant 480c



The HP ProLiant BL480c was introduced as a new category of server blade that delivers an unmatched combination of two processors, Multi-Core performance, and expansion. Designed to keep pace with high computing demands, the HP ProLiant BL480c now offers the latest outstanding Quad-Core Intel Xeon processing power, up to 48GB of PC2-5300 DDR2 Fully Buffered DIMMs, mirrored memory, online spare capability, three PCI-Express I/O expansion slots via mezzanine cards, support for up to 4 hot-plug small form factor (SFF) SAS or SATA hard disk drives, and management tools that make it easy to deploy and maintain. The HP ProLiant BL480c has more than you've come to expect from a two-processor server blade, and can handle your most challenging applications.

## Other reasons we win in performance and price-performance

### 4Gb SAN Switch for HP c-Class BladeSystem



The Brocade 4Gb SAN Switch for HP c-Class BladeSystem delivers an easy-to-manage embedded Fibre Channel switch solution with 4 Gbps performance to HP BladeSystem c-Class customers deploying a small SAN or expanding their current SAN. The Brocade 4Gb SAN Switch hot-plugs into the back of the HP BladeSystem c-Class Enclosure, freeing up rack space.

Server and switch interconnects internal to the BladeSystem reduce cabling, SFPs, and associated costs while improving reliability. Shared power and cooling resources further reduce costs and additional points of failure. The integrated Fibre Channel switch within the HP c-Class BladeSystem increases flexibility and performance while reducing costs through rack consolidation, reduced cabling, and fewer SFPs.

### HP InfiniBand® Interconnect for HP BladeSystem



Introducing the 4X DDR InfiniBand® option for HP BladeSystem c-Class, now available as the high performance interconnect option for scale-out cluster solutions.

The HP 4X DDR IB Mezzanine HCA is a single-port 4X DDR InfiniBand PCI-Express Mezzanine adapter for HP c-Class server blades. The HP 4X DDR IB Mezzanine HCA can be plugged into PCI-Express connectors on HP c-Class server blades; however, to obtain the best performance, it is required to plug the HCA into the x8 PCI-Express connector on the server blades.

The HP 4X DDR IB Switch Module is a double wide switch module for the c-Class enclosure. It has 16 downlinks to connect up to 16 server blades in the enclosure, and 8 uplinks to connect to the external InfiniBand switches to build an InfiniBand fabric. All links conform to InfiniBand Trade Association (IBTA) specifications.

### HP MSA1000



The MSA1000, used in the ProLiant BL460c TPC-C Benchmark, is the premiere storage system in the HP StorageWorks Modular Smart Array family, delivering industry-leading technology to meet today's demanding and growing storage needs. The performance and scalability of the MSA1000 allows for up to 18 additional ProLiant servers to be connected providing maximum return on investment and minimal storage management costs.

## The advantages of the partnership between HP and Oracle

Strategic partners for over twenty-five years, HP and Oracle have more than 100,000 joint customers. Our accomplishments together are numerous. Here are just a few:

- A strong breadth and depth of platform, software and middleware solutions
- Joint development, testing, and refinement
- Performance and price/performance leadership validated by industry and Oracle benchmarking
- HP Consulting and Integration Services deliver solutions for Enterprise Integration and Service Oriented Architecture with Oracle Fusion Middleware

- HP is the leading Oracle Applications Infrastructure Partner
- Thirteen HP/Oracle solution and demo centers worldwide
- Oracle Fusion Middleware is showcased in HP's SOA Competency Centers around the world
- Oracle chose HP to be the key platform provider for its development of Itanium®-based databases for Linux, Unix, and Windows
- Executive alignment that starts at the top and runs deep

HP and Oracle aim to address today's business challenges by enabling the synchronization of infrastructure, applications, services, and business processes – from suppliers through to customers – to help organizations reduce the cost of change, reduce total cost of ownership, simplify IT management complexity, and rapidly implement solutions that provide a competitive advantage.

## For more information

HP ProLiant BL480c: [www.hp.com/servers/proliantbl480c](http://www.hp.com/servers/proliantbl480c)

A full disclosure report describing these benchmark results has been filed with the Transaction Processing Performance Council (TPC) and is available upon request. The full disclosure report describes the benchmark hardware and software configuration in detail, provides costs, and lists the code actually used to perform the test. Similar reports from other vendors are the source of the price/performance comparisons provided above. Summaries of all tests are published each month by the TPC. Summaries are also posted on the Internet on the TPC's World Wide Web Server. With these benchmarks, customers can objectively compare the performance of different vendors' servers in specific areas such as database throughput in transactions per minute (tpmC) and cost per transactions per minute (\$/tpmC).

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