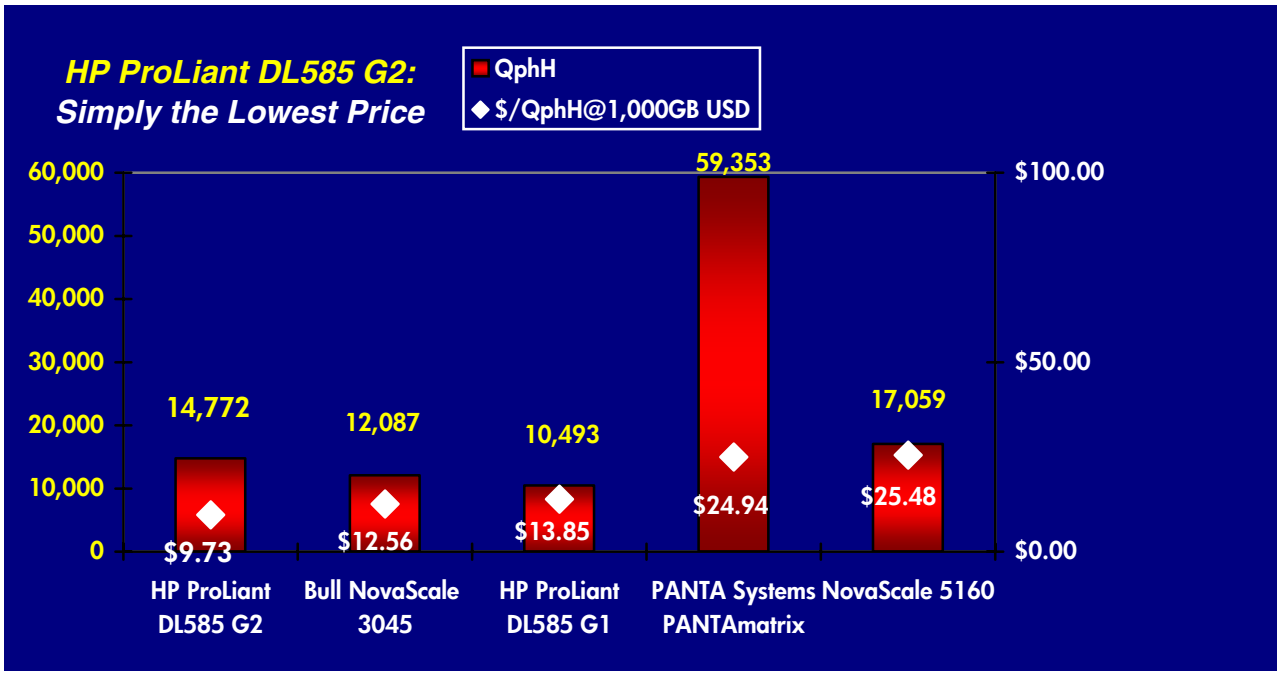
HP ProLiant DL585 G2 breaks records on TPC-H@1,000GB benchmark

Interpreting the TPC-H@1,000GB result

- **First result under $10/QphH@1,000GB USD**
- **Lowest cost result**
- **Best 4-socket performance result**

HP, a market leader for industry-standard servers, announced on April 25, 2007, the **first result under $10/QphH@1,000GB USD on the TPC-H@1,000GB (1 TB) decision support benchmark**. The ProLiant DL585 G2 4-socket server achieved this lowest cost result on the TPC-H@1,000 GB benchmark with **14,772 QphH, $9.73/QphH@1,000GB USD**, running Windows Server 2003 Enterprise x64 Edition operating system and SQL Server 2005 Enterprise x64 Edition database.

Figure 1. The 5 lowest-cost results on the TPC-H @ 1,000 GB benchmark



ProLiant server configuration

The HP ProLiant DL585 G2 was configured with 4 AMD Opteron Dual-Core 2.8 GHz DC AMD 8220SE processors (4 processors/8 cores/8 threads), with 1MB L2 cache and 32GB main memory. The server used 2 x 36GB 15K-rpm HP Small Form Factor SAS internal disk drives for OS. The server was configured with 1x E500, and 1x P600, and 6x P800 HP Smart Array controllers using 2x 36GB and 4x 146GB drives (internal) and 200x 36GB drives (external) in 8x HP StorageWorks 70 Modular Smart Array enclosures.

Lowest cost and best 4-socket performance

Table 1. Top price/performance results on TPC-H @ 1,000 GB benchmark

System	QphH	Price/QphH	System Availability	Database	OS
HP ProLiant DL585 G2	14,772	$9.73/QphH@1,000GB USD	04/25/07	Microsoft SQL Server 2005 Enterprise x64 Edition	Microsoft Windows Server 2003 Enterprise x64 Edition
Bull NovaScale 3045	12,087	$12.56/QphH@1,000GB USD	03/06/07	Microsoft SQL Server 2005 Enterprise IA64 Edt SP1	Microsoft Windows Server 2003 Enterprise IA64 Edt. SP1
HP ProLiant DL585G1	10,493	$13.85/QphH@1,000GB USD	03/02/06	Microsoft SQL Server 2005 Enterprise x64 Edition	Microsoft Windows Server 2003 Enterprise x64 Edition
PANTA Systems PANTAmatrix	59,353	$24.94/QphH@1,000GB USD	04/15/07	Oracle Database 10g release2 Enterpise Editi	Red Hat Enterprise Linux 4 AS
Bull NovaScale 5160	17,059	$25.48/QphH@1,000GB USD	05/08/06	Microsoft SQL Server 2005 Enterprise Edition 64bit	Microsoft Windows Server 2003 Datacenter

Table 2. Top five 4-socket performance results on TPC-H @ 1,000 GB benchmark

System	QphH	Price/QphH	System Availability	Database	OS
HP ProLiant DL585 G2	14,772	$9.73/QphH@1,000GB USD	04/25/07	Microsoft SQL Server 2005 Enterprise x64 Edition	Microsoft Windows Server 2003 Enterprise x64 Edition
Bull NovaScale 3045	12,087	$12.56/QphH@1,000GB USD	03/06/07	Microsoft SQL Server 2005 Enterprise IA64 Edt SP1	Microsoft Windows Server 2003 Enterprise IA64 Edt. SP1
HP ProLiant DL585 G1	10,493	13.85/QphH@1,000GB USD	3/2/2006	Microsoft SQL Server 2005 Enterprise x64 Edition	Microsoft Windows Server 2003 Enterprise x64 Edition
SunFire V490	4,368	31.17/QphH@1,000GB USD	1/5/2006	Sybase Sybase IQ 12.5	Sun Solaris 10
SunFire V490	3,446	41.47/QphH@1,000GB USD	5/9/2005	Sybase IQ 12.5	Sun Solaris 10

Why HP wins in performance

The latest DL585 G2 server

The HP ProLiant DL585 G2 continues to maintain price to performance and performance to watt leadership, posting industry leading numbers in both 64-bit TPC-C price/performance and TPC-H at 100GB and 1,000GB benchmarks. The consistent power envelope, dual-core processors, AMD Virtualization technology (AMD-V) and the industry leading 128GB memory footprint enables most applications to run faster and Virtualized environment to support more users than other systems.

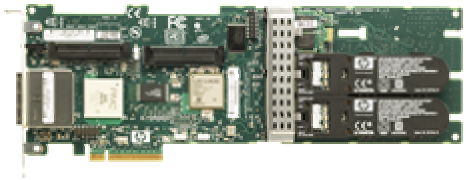
HP Smart Array Controller E500

The HP Smart Array E500 is HP's first external connect only, entry level PCI Express (PCIe) Serial Attached SCSI (SAS) RAID controller. The full size card has 8 ports (2 x4 mini SAS external connectors) and utilizes DDR2-533 memory. The E500 offers RAID 0, 1 and 0+1 and can be upgraded with the battery-backed write cache (BBWC) module for RAID 5. This low-profile card is ideal for customers needing a low-cost external connect for HP ProLiant servers to tape, JBODs, and intelligent Modular Storage Arrays (MSA).

HP Smart Array Controller P600

The HP Smart Array P600 serial attached SCSI (SAS) controller provides new levels of performance and reliability for HP servers, through its support of the latest SCSI technology and advanced RAID capabilities. The first of a new generation of SAS Smart Array controllers, the SA-P600 raises the standards of performance offering twice the bandwidth of a 4-channel U320 array controller.

HP Smart Array Controller P800



The HP Smart Array P800 is a 16 port, PCIe SAS controller. It ships standard with 512MB cache, dual batteries and RAID 6 (ADG) support. This controller supports up to 108 hard drives and is the highest performing controller in the Smart Array portfolio.

HP StorageWorks 70 Modular Smart Array

The HP StorageWorks 70 Modular Smart Array is an end-to-end flexible storage array, offering data availability, enhanced reliability, enhanced performance and tiered storage capability up to 14.4 TB with SAS and SATA drives and investment protection.

HP SFF SAS drives

The transition to SFF SAS drives is the most significant transition in the industry's history, fueled by the biggest required leap in storage capacity ever experienced along with the need for faster access to stored data.

For more information

HP ProLiant DL585: www.hp.com/servers/proliantdl585

HP ProLiant storage solutions: www.hp.com/go/serial

TPC: Results valid as of April 25, 2007. Complete results can be found at http://www.tpc.org.

The TPC Benchmark™H (TPC-H) is a decision support benchmark. It consists of a suite of business oriented ad-hoc queries and concurrent data modifications. The queries and the data populating the database have been chosen to have broad industry-wide relevance. This benchmark illustrates decision support systems that examine large volumes of data, execute queries with a high degree of complexity, and give answers to critical business question. The performance metric reported by TPC-H is called the TPC-H Composite Query-per-Hour Performance Metric (QphH@Size), and reflects multiple aspects of the capability of the system to process queries. These aspects include the selected database size against which the queries are executed, the query processing power when queries are submitted by a single stream, and the query throughput when queries are submitted by multiple concurrent users. The TPC-H Price/Performance metric is expressed as $/QphH@Size. 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 TPCand 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.