**ProLiant BL685c
ProLiant DL365**

HP ProLiant BL685c and DL365 servers post their first results on the two-tier SAP® SD Standard Application Benchmark

The HP ProLiant BL685c server blade delivers no-compromise performance and expansion in the densest 4P server blade available.

BL685c and other 4P server results

SAP SD Benchmark users

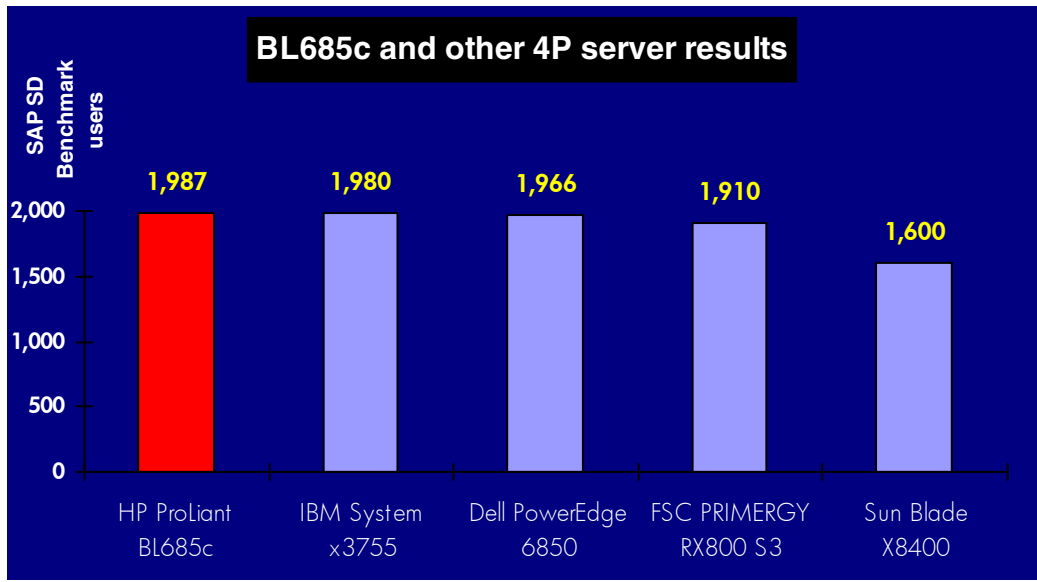|	
1,987	HP ProLiant BL685c
1,980	IBM System x3755
1,966	Dell PowerEdge 6850
1,910	FSC PRIMERGY RX800 S3
1,600	Sun Blade X8400

Figure 1 (Configurations and results on last page)

Combining concentrated 1U compute power, integrated Lights-Out management, and essential fault tolerance, the new DL365 is a great choice for any business where space is at a premium.
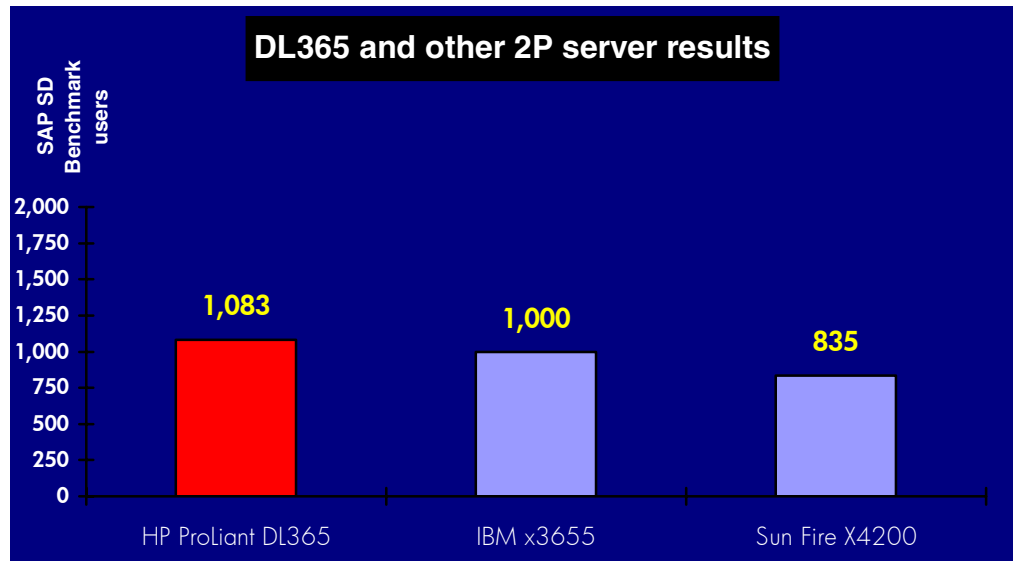
DL365 and other 2P server results

SAP SD Benchmark users

1,083	HP ProLiant DL365
1,000	IBM x3655
835	Sun Fire X4200

Figure 2 (Configurations and results on last page)

More information about all servers can be found at the following Web page: http://www.sap.com/benchmark. Results as of 3/19/07.

Prepared by the ESS Competitive Intelligence Team

ProLiant server configurations

Tests were performed on the ProLiant servers by HP's Houston Solution Alliances SAP Engineering lab in Houston, TX. HP received certification from SAP AG of the results on the two-tier SAP® Sales and Distribution (SD) Standard Application Benchmark for the ProLiant BL685c (#2007007) on February 12, 2007, and for the ProLiant DL365 (#2007006) on February 9, 2007. The servers were running Microsoft Windows Server 2003 Enterprise Edition operating system, Microsoft SQL Server 2005 database, and the mySAP™ ERP 2005 application. The BL685c was configured with 4 x 3.0GHz Dual-Core AMD Opteron Processor Model 8220 (4 processors/8 cores/8 threads), with 32 KB L1 cache per core and 4MB L2 cache per processor, and 32GB main memory. The DL365 was configured with 2 x 2.8GHz Dual-Core AMD Opteron Processor Model 2220 (2 processors/4 cores/4 threads), with 128 KB L1 cache and 1 MB L2 cache per core.
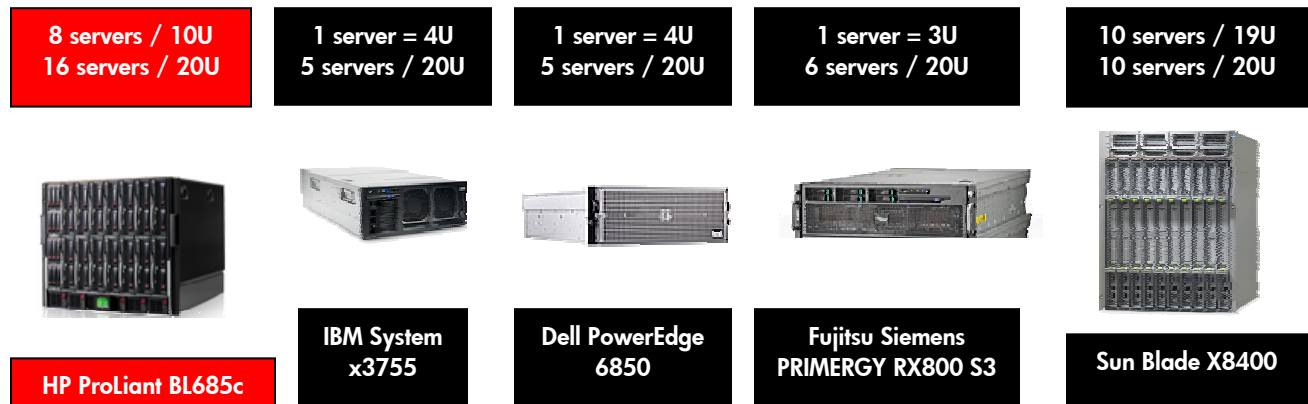
Results: The ProLiant BL685c achieved 1,987 SAP SD Benchmark users, equivalent to a throughput of 199,000 fully processed order line items per hour, and the ProLiant DL365 achieved 1,083 SAP SD Benchmark users, equivalent to a throughput of 108,670 fully processed order line items per hour.

HP leads in density-optimized solutions

HP offers the most comprehensive, density-optimized solutions for rack environments that are adaptable to a wide range of complex, growing multi-server environments. Two deployment options HP offers for use in a variety of rack-mount environments include universal rack rails fit in both square- and round-hole racks with an optional ambidextrous cable management arm and Telco rack option.

HP blade solutions offer a wide variety of choices for customers. HP offers 10 different blades and 2 chassis infrastructures. Other vendors offer fewer choices. The HP ProLiant BL685c achieves excellent performance per U with 8 blades in 10U. Per 42U rack the BL685c achieves up to 32 blades and 128 processors.

Figure 3. Compute density comparison

8 servers / 10U 16 servers / 20U	1 server = 4U 5 servers / 20U	1 server = 4U 5 servers / 20U	1 server = 3U 6 servers / 20U	10 servers / 19U 10 servers / 20U
HP ProLiant BL685c	IBM System x3755	Dell PowerEdge 6850	Fujitsu Siemens PRIMERGY RX800 S3	Sun Blade X8400

Prepared by the ESS Competitive Intelligence Team

HP servers and storage behind the results

HP ProLiant BL685c

The all-new HP ProLiant BL685c server blade delivers no-compromise performance and expansion in the densest 4P server blade available. With up to four AMD Opteron™ 8000 Series processors, 64GB of DDR2 memory, two hot-plug Serial Attached SCSI (SAS) or Serial ATA (SATA) hard-drives, four embedded Gigabit NICs and three I/O expansion slots, the HP ProLiant BL685c delivers the density you want with the performance you need to handle the most demanding enterprise class applications.

HP ProLiant DL365

Combining concentrated 1U compute power, integrated Lights-Out management, and essential fault tolerance, the DL365 is optimized for space constrained installations. Dual-Core AMD Opteron processors, DDR2 memory, Serial Attached SCSI (SAS) and PCI Express technology provide a high performance system ideal for the full range of scale out applications. What's more, the DL365 provides fault tolerant in an ultra dense platform with redundant power, redundant fans, embedded RAID capability, and full-featured remote Lights-Out management.

HP Small Form Factor (SFF) SAS drives

The transition to SFF SAS drives is one of the most significant transitions 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. SFF SAS drives offer the following advantages over 3.5" SCSI drives:

- **Higher reliability**
  - 1.7 million mean time between failures (MTBF) vs. 1.5 million MTBF for 3.5" SCSI
- **Better performance**
  - Serial point-to-point connections
  - More spindles per platform
- **Greater efficiency and improved thermals**
  - Half the power consumption – 9 Watts
  - SFF enables better airflow

Airflow ⬅
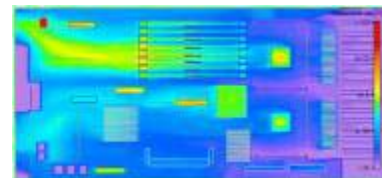
HP Smart Array Controller E200i

The HP Smart Array E200i, used by the BL685c, is HP's first entry level PCI Express (PCIe) Serial Attached SCSI (SAS) RAID controller. The full-size card has 8 ports and utilizes DDR1-266 memory. The E200 is ideal for RAID 0/1 and can be upgraded with the 128MB battery-backed write cache (BBWC) module for RAID 5.

HP Smart Array Controller P400i

The HP Smart Array P400i, used by the MSA in one of the benchmarks, is the integrated version of the P400, HP's first PCI-Express (PCIe) serial attached SCSI (SAS) RAID controller that provides new levels of performance and reliability for HP servers, through its support of the latest SCSI technology and advanced RAID capabilities.

HP Smart Array Controller P600

The HP Smart Array P600, used by the ProLiant DL365 in its benchmark, a 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 offers twice the bandwidth of a 4-channel U320 array controller. The P600 offers a 512 MB BBWC option.

HP MSA 1000

The MSA1000, used by the ProLiant BL685c in its benchmark, is the premiere storage system in the HP StorageWorks Modular Smart Array family, delivering industry-leading

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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.

HP MSA 50

The HP Modular Smart Array 50 Enclosure family is an HP Serial Attach SCSI (SAS) Small Form Factor (SFF) disk drive storage enclosure, delivering industry-leading data performance, availability and upgradeability to meet demanding and growing storage needs.

The advantages of the partnership between HP, SAP and Microsoft

Extensive experience and a close relationship are keys to making the partnership between HP, SAP AG, and Microsoft a success. Working together, HP, SAP, and Microsoft deliver design, sizing, and project plans geared to their customers' needs and strategies. SAP, Microsoft, and HP also collaborate very closely in research and development. Tests and benchmarks provide hard facts on our performance and capabilities.

Well over 50,000 successful joint installations reflect HP's deep understanding of the deployment and customer requirements for SAP ERP solutions and the mySAP Business Suite family of applications. No other company has completed more installations of SAP solutions than HP — that's because HP understands how to turn customer demands into business tools using mySAP Business Suite and other SAP solutions. Across all major operating systems, one out of every two SAP solution-based installations runs on HP infrastructure.

HP Virtualized Infrastructure Solutions for mySAP Business Suite

The ability to swiftly adapt to ever-changing business requirements is the key success factor in today's business environments. However, this implies an adaptive SAP solution-based landscape, which is required by many customers today. HP Virtualized Infrastructure Solutions (VIS) for mySAP Business Suite enables customers to increase the flexibility and manageability of their system landscapes that include SAP solutions.

With HP VIS for mySAP Business Suite, customers can overcome the boundaries of yesterday's infrastructure. Instead of working in inefficient silos, a simplified IT will grow in flexibility and scalability, enabling customers to respond to changes in demand more quickly by dynamically allocating computing power, storage, and network resources according to the demand of the SAP application. And better still: Improved overall manageability provides substantial reductions in costs of operation.

For more information

HP ProLiant BL685c: www.hp.com/servers/proliantbl685c

HP ProLiant DL365: www.hp.com/servers/proliantdl365

Configuration details

4P results

IBM System x3755 results on the two-tier SAP SD Standard Application Benchmark. The IBM x3755 (Certification #2006088) was configured as a four-processor server (4 processors/8 cores/8 threads) with Dual-Core AMD Opteron Processor Model 8220SE 2.8GHz processors with 128KB L1 cache and 1MB L2 cache per core, and 32GB main memory. The IBM x3755 was running mySAP ERP 2005 (64-bit) with Microsoft Windows Server 2003 Enterprise Edition (64-bit) and DB2 UDB 8 (64-bit) database and achieved 1,980 SAP SD Benchmark users, equivalent to a throughput of 198,330 fully processed order line items per hour.

Dell PowerEdge 6850 results on the two-tier SAP SD Standard Application Benchmark. The Dell PowerEdge 6850 (Certification #2006063) was configured as a four-processor server (4 processors/8 cores/16 threads) with Quad-Core Intel Xeon 7140M 3.4GHz processors with 16KB L1 cache and 1 MB L2 cache per core, and 16MB L3 cache per processor, and 32GB main memory. The Dell PowerEdge 6850 was running mySAP ERP 2005 (64-bit) with Microsoft Windows Server 2003 Enterprise Edition (64-bit) and SQL Server 2005 (64-bit) database and achieved 1,966 SAP SD Benchmark users, equivalent to a throughput of 197,000 fully processed order line items per hour.

Fujitsu Siemens PRIMERGY RX800 S3 result on the two-tier SAP SD Standard Application Benchmark. The Fujitsu Siemens RX800 S3 (Certification #2006075) was configured as a four-processor server (4 processors/8 cores/16 threads) with Quad-Core Intel Xeon 7140N 3.3GHz processors with 16KB L1 and 1 MB L2 cache per core, 16MB L3 cache per core, and 64GB main memory. The Fujitsu RX800 was running mySAP ERP 2004 (64-bit) with Microsoft Windows Server 2003 Enterprise Edition (64-bit) and Microsoft SQL Server 2005 (64-bit) database and achieved 1,910 SAP SD Benchmark users, equivalent to a throughput of 191,000 fully processed order line items per hour.

Sun Blade x8400 results on the two-tier SAP SD Standard Application Benchmark. The Sun Blade x8400 (Certification #2006086) was configured as a four-processor server (4 processors/8 cores/8 threads) with Dual-Core AMD Opteron Processor Model 885 2.6GHz processors with 128KB L1 and 1 MB L2 cache per core, and 32GB main memory. The Sun Blade x8400 was running mySAP ERP 2005 (Unicode) with Solaris 10 and Oracle 10g database and achieved 1,600 SAP SD Benchmark users, equivalent to a throughput of 160,670 fully processed order line items per hour.

2P results

IBM System x3655 results on the two-tier SAP SD Standard Application Benchmark. The IBM x3655 (Certification #2006081) was configured as a two-processor server (2 processors/4 cores/4 threads) with Dual-Core AMD Opteron Model 2218 2.6GHz processors with 128KB L1 and 1 MB L2 cache per core, and 16GB main memory. The IBM x3655 was running mySAP ERP 2005 (64-bit) with Microsoft Windows Server 2003 Enterprise Edition (64-bit) and DB2 UDB 9 (64-bit) database and achieved 1,000 SAP SD Benchmark users, equivalent to a throughput of 100,330 fully processed order line items per hour.

Sun Microsystems Sun Fire X4200 results on the two-tier SAP SD Standard Application Benchmark. The Sun Fire X4200 (Certification #2006087) was configured as a two-processor server (2 processors/4 cores/4 threads) with Dual-Core AMD Opteron Model 285 2.6GHz processors with 128KB L1 and 1 MB L2 cache per core, and 16GB main memory. The Sun Fire X4200 was running mySAP ERP 2005 (Unicode) with Solaris 10 (64-bit) and Oracle 10g (64-bit) database and achieved 835 SAP SD Benchmark users, equivalent to a throughput of 83,670 fully processed order line items per hour.

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