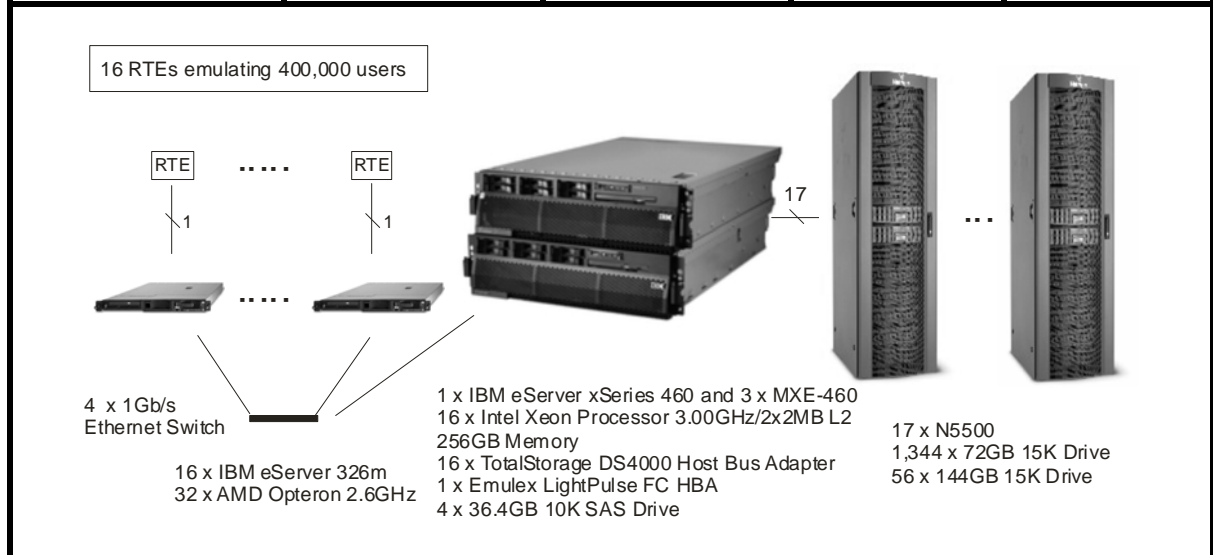


| | | | |
|---|---|---|---|
| IBM Corporation | IBM® eServer™ xSeries® 460 | | TPC-C Rev. 5.6 |
| | IBM System Storage™ N5000 | | Report Date 03/21/06 |
| Total System Cost | TPC-C Throughput | Price/Performance | Availability Date |
| \$3,011,533 USD | 492,307 tpmC | \$6.12 USD /tpmC | May 20, 2006 |
| Database Server Processors/Cores/Threads | Database Manager | Operating System | Other Software |
| 16/32/64 Intel® Xeon® Processor 7040 3.00GHz | Microsoft SQL Server 2005 Enterprise x64 Edition (SP1) | Microsoft Windows Server 2003 Datacenter x64 Edition | Microsoft Visual C++ Standard Edition Microsoft COM+ |
| | | | Number Of Users |
| | | | 400,000 |



| System Component | Qty | Server | Qty | Each of 16 Clients |
|---------------------------------|------------------|--|------------|---------------------------|
| Processors/Cores/Threads | 16/32/64 | Intel Xeon Processor 7040 3.00GHz | 2/2/2 | AMD Opteron 2.6GHz |
| Cache | | 2x2MB L2 | | 1MB L2 Cache |
| Memory | 32 | 8 (2x4GB) PC2-3200 | 4 | 512MB PC-3200 |
| Disk Controllers | 17 16 1 | IBM System Storage N5500 IBM TotalStorage DS4000 HBA Emulex LightPulse HBA | | |
| Disk Drives | 4 1,344 56 | 36.4GB 10K SAS Drive 72GB 15K Drive 144GB 15K Drive | 1 | 36.4GB 15K U320 |
| Total Storage | | 96820.31GB | | |

IBM Corporation

**IBM® eServer™ xSeries® 460
IBM System Storage™ N5000
Microsoft® SQL Server 2005 (SP1)**

TPC-C Rev. 5.6

**Report Date
03/21/06**

| IBM Corporation | | IBM eServer xSeries 460 c/s with Microsoft SQL Server 2005 | | | TPC-C Revision 5.6 Report Date: Mar. 21, 2006 | | | |
|--|--------------------|---|---------|--------------|--|-----------------|--------------------|----------------|
| Description | Part Number | Third Party | | Unit Price | Quantity | Extended Price | 3-Yr. Maint. Price | |
| | | Brand | Pricing | | | | | |
| Server Hardware | | | | | | | | |
| xSeries 460 with 4 x Intel Xeon Processor 7040 3.00GHz/2x2MB L2 | 8872-6EU* | IBM | 1a | 50,779 | 1 | 50,779 | | |
| Intel Xeon Processor 7040 3.00GHz/2x2MB L2 | 25R8942 | IBM | | 4,729 | 12 | 56,748 | | |
| MXE-460 (0 Processors, 0 Memory, 2 Memory Cards) | 8874-2EU* | IBM | 1a | 16,569 | 3 | 49,707 | | |
| 2.3M Scalability Cable | 13M7414 | IBM | | 299 | 6 | 1,794 | | |
| 8GB (2x4GB) PC2-3200 CL3 2RX4 ECC DDR2 SDRAM RDIMM | 30R5145 | IBM | | 5,299 | 32 | 169,568 | | |
| Active Memory 4-Slot Memory Expansion Card | 13M7409 | IBM | | 499 | 4 | 1,996 | | |
| xSeries 460 Scalability Enablement/Memory Adapter | 40K2450 | IBM | | 849 | 4 | 3,396 | | |
| IBM 36.4GB 10K 2.5 inch SAS Drive | 26K5654 | IBM | | 419 | 4 | 1,676 | | |
| IBM TotalStorage DS4000 Host Bus Adapter | 24P0960 | IBM | | 1,485 | 16 | 23,760 | | |
| Emulex LightPulse Fibre Channel Host Bus Adapter (2 spares) | LP9002L-F2 | Emulex | | 1,195 | 3 | 3,585 | | |
| ServicePac for 3-Year 24x7x4 Support (x460 and MXE-460) | 96P2688 | IBM | | 3,390 | 4 | | 13,560 | |
| | | | | | | Subtotal | 363,009 | 13,560 |
| Server Storage | | | | | | | | |
| IBM System Storage N5500 Model A20 - 12.096TB Raw Storage | 2865-A20 | IBM | | 245,743 | 8 | 1,965,945 | | |
| 2 x Dual-Port FC HBA | 2865-1004 | IBM | | | 2 | 0 | | |
| 2 x 5m Copper Cluster 4X IB Cable | 2865-1038 | IBM | | | 2 | 0 | | |
| Field-Install Rkmt Kit | 2865-9202 | IBM | | | 2 | 0 | | |
| IBM System Storage EXN2000 | 2863-001 | IBM | | | 2 | 0 | | |
| 8 x 0.5m FC Copper Cable | 2863-2021 | IBM | | | 2 | 0 | | |
| 112 x 72GB 15K rpm FC HDD | 2863-4001 | IBM | | | 2 | 0 | | |
| IBM System Storage EXN2000 | 2863-001 | IBM | | | 2 | 0 | | |
| 4 x SFP GBIC | 2863-2010 | IBM | | | 2 | 0 | | |
| 4 x 5m FC Optical Cable | 2863-2044 | IBM | | | 2 | 0 | | |
| 56 x 72GB 15K rpm FC HDD | 2863-4001 | IBM | | | 2 | 0 | | |
| IBM System Storage N5500 Model A10 | 2865-A10 | IBM | | 154,131 | 1 | 154,131 | | |
| 2 x Dual-Port FC HBA | 2865-1004 | IBM | | | 2 | 0 | | |
| Field-Install Rkmt Kit | 2865-9202 | IBM | | | 2 | 0 | | |
| IBM System Storage EXN2000 | 2863-001 | IBM | | | 2 | 0 | | |
| 4 x SFP GBIC | 2863-2010 | IBM | | | 2 | 0 | | |
| 4x 5m FC Optical Cable | 2863-2044 | IBM | | | 2 | 0 | | |
| 56 x 144GB 15K rpm FC HDD | 2863-4003 | IBM | | | 2 | 0 | | |
| IBM System Storage N5500 Licensed Functions 651 (Data ONTAP) | 2870-651 | IBM | | | 2 | 0 | | |
| Fibre Channel Protocol | 2870-7469 | IBM | | | 2 | 0 | | |
| APC SMART UPS 3000VA RM 2U (2 spares) | SUA3000RM2U | APC | | 1,080 | 3 | 3,240 | | |
| 7x24x365 Support | | IBM | | 21,653 | 4 | | 86,610 | |
| | | | | | | Subtotal | 2,123,316 | 86,610 |
| Server Software | | | | | | | | |
| Microsoft SQL Server 2005 Enterprise x64 Edition | 810-03134 | Microsoft | | 24,999 | 16 | 399,984 | | |
| Microsoft Problem Resolution Services | | Microsoft | | 245 | 1 | | 245 | |
| Microsoft Windows Server 2003 Datacenter x64 Edition * | Included with x460 | Microsoft | | 0 | 0 | 0 | | |
| Software Update Subscription for Datacenter x64 Edition | 4818-HAX | IBM | | 2,239 | 4 | | 8,956 | |
| 3 Year Remote Technical Support for xSeries and Datacenter | 41C6022 | IBM | | \$13,755 | 1 | | 13,755 | |
| Microsoft Discount on SQL Server - Open Program Level C | | | | 6% Discount | | 25,072 | | |
| | | | | | | Subtotal | 374,912 | 22,956 |
| Client Hardware | | | | | | | | |
| eServer 326m Model 252 2.6 GHz/1MB, 1GB, SCSI H/S open bay | 7969-81U | IBM | 1a | 2,109 | 16 | 33,744 | | |
| AMD Opteron Processor Model 252 2.6GHz/1MB | 13N0703 | IBM | | 919 | 16 | 14,704 | | |
| 1GB (2x512MB) PC-3200 DDR ECC SDRAM RDIMM | 73P3233 | IBM | | 329 | 16 | 5,264 | | |
| 36.4GB 15K Ultra320 SCSI Drive | 90P1380 | IBM | | 249 | 16 | 3,984 | | |
| NetXtreme 1000T Dual-Port Ethernet Adapter | 73P4201 | Intel | | 249 | 32 | 7,968 | | |
| ServicePac for 3-Year 24x7x4 Support (e326) | 96P2250 | IBM | | 419 | 16 | | 6,704 | |
| | | | | | | Subtotal | 65,664 | 6,704 |
| Client Software | | | | | | | | |
| Microsoft Windows Server 2003 Standard Edition | P73-00295 | Microsoft | | 999 | 16 | 15,984 | | |
| Microsoft Visual C++ Standard Edition | 254-00170 | Microsoft | | 109 | 1 | 109 | | |
| Microsoft Discount on Server 2003 - Open Program No Level | | | | 28% Discount | | 4,480 | | |
| | | | | | | Subtotal | 11,613 | |
| Network Components | | | | | | | | |
| USB-to-PS2 Converter (2 spares) | 35700 | | | 8 | 18 | 144 | | |
| Ethernet Cable 20 Ft. (10% spares) | CC5E-B14B | | | 6 | 4 | 27 | 108 | |
| Netgear 8-Port Switch | GS-108 | | | 80 | 7 | 560 | | |
| AutoView 424 2-Users Switch w/o Receiver / 24 Systems (2 spares) | AV424-AM | | 1a | 2,695 | 3 | 8,085 | | |
| E54 15" (13.8" Viewable) Color Monitor | 633147N | IBM | | 139 | 1 | 139 | | |
| IBM USB Keyboard Enhanced Performance Keyboard | 73P2620 | IBM | | 29 | 1 | 29 | | |
| IBM USB Optical Wheel Mouse | 06P4069 | IBM | | 12 | 1 | 12 | | |
| ServicePac for 3-Year 24x7x4 Support (Monitor) | 30L9183 | IBM | | | 1 | | 90 | |
| | | | | | | Subtotal | 9,077 | 90 |
| Discounts amounts based on unit volume; prices vary if purchased separately (see Note 1) | | | | | | Discount | 61,885 | 4,093 |
| | | | | | | Total | 2,947,591 | 129,920 |

Pricing: 1- Compsat Technology (*Datacenter included); 2 - Jeskell; 3 - Microsoft; 4 - CDW.com; 5 - buy.com; 6 - newegg.com; 7 - www.cablestogo.com. **Three-Year Cost of Ownership USD: \$3,011,533**
 tpmC: 492,307
 \$ USD/tpmC: \$6.12

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted.
 Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org.
 Audited by Bradley J. Askins, InfoSizing, Inc.

| | | |
|----------------------------|--|---------------------------------|
| IBM Corporation | IBM® eServer™ xSeries® 460 IBM System Storage™ N5000 Microsoft® SQL Server 2005 (SP1) | TPC-C Rev. 5.6 |
| | | Report Date 03/21/06 |

Numerical Quantities Summary

MQTh, Computed Maximum Qualified Throughput: 492,307 tpmC

| Response Times (in seconds) | 90 th Percentile | Average | Maximum |
|--------------------------------|-----------------------------|---------|---------|
| New Order | 1.50 | 0.57 | 8.09 |
| Payment | 1.46 | 0.55 | 8.11 |
| Delivery | 1.02 | 0.33 | 3.33 |
| Stock Level | 1.72 | 0.77 | 5.06 |
| Order Status | 1.48 | 0.57 | 6.52 |
| Delivery (Deferred) | 0.16 | 0.12 | 5.11 |
| Menu | 1.00 | 0.33 | 3.98 |

Response Time Delay Added for Emulated Components: 0.1 Seconds

| Transaction Mix (in percent of total transactions) | Percent |
|--|---------|
| New Order | 44.95 |
| Payment | 43.02 |
| Delivery | 4.01 |
| Stock Level | 4.01 |
| Order Status | 4.01 |

| Keying/Think Times (in seconds) | Minimum | Average | Maximum |
|------------------------------------|--------------|---------------|----------------|
| New Order | 18.00 / 0.00 | 18.00 / 12.04 | 18.02 / 120.31 |
| Payment | 3.00 / 0.00 | 3.00 / 12.04 | 3.02 / 120.31 |
| Delivery | 2.00 / 0.00 | 2.00 / 5.04 | 2.02 / 50.31 |
| Stock Level | 2.00 / 0.00 | 2.00 / 5.04 | 2.02 / 50.31 |
| Order Status | 2.00 / 0.00 | 2.00 / 10.04 | 2.02 / 100.31 |

Test Duration

| | |
|---|-----------------------|
| Ramp-up Time | 85 minutes 41 seconds |
| Measurement Interval | 120 minutes |
| Number of Checkpoints | 4 |
| Checkpoint Interval | 30 minutes |
| Number of transactions (all types) completed in measurement interval | 136,699,824 |