



DELL
PowerEdge 2900
 with SQL Server 2005 Enterprise
 x64 Edition™ SP1

TPC-H Revision 2.3.0

Report Date: **Nov 27, 2006**

Revision Date: **Jun 7, 2007**

Total System Cost
\$117,022 USD

TPC-H Composite Query per Hour
15,723.9 QphH@100GB

Price/Performance
\$7.45 USD/ QphH@100GB

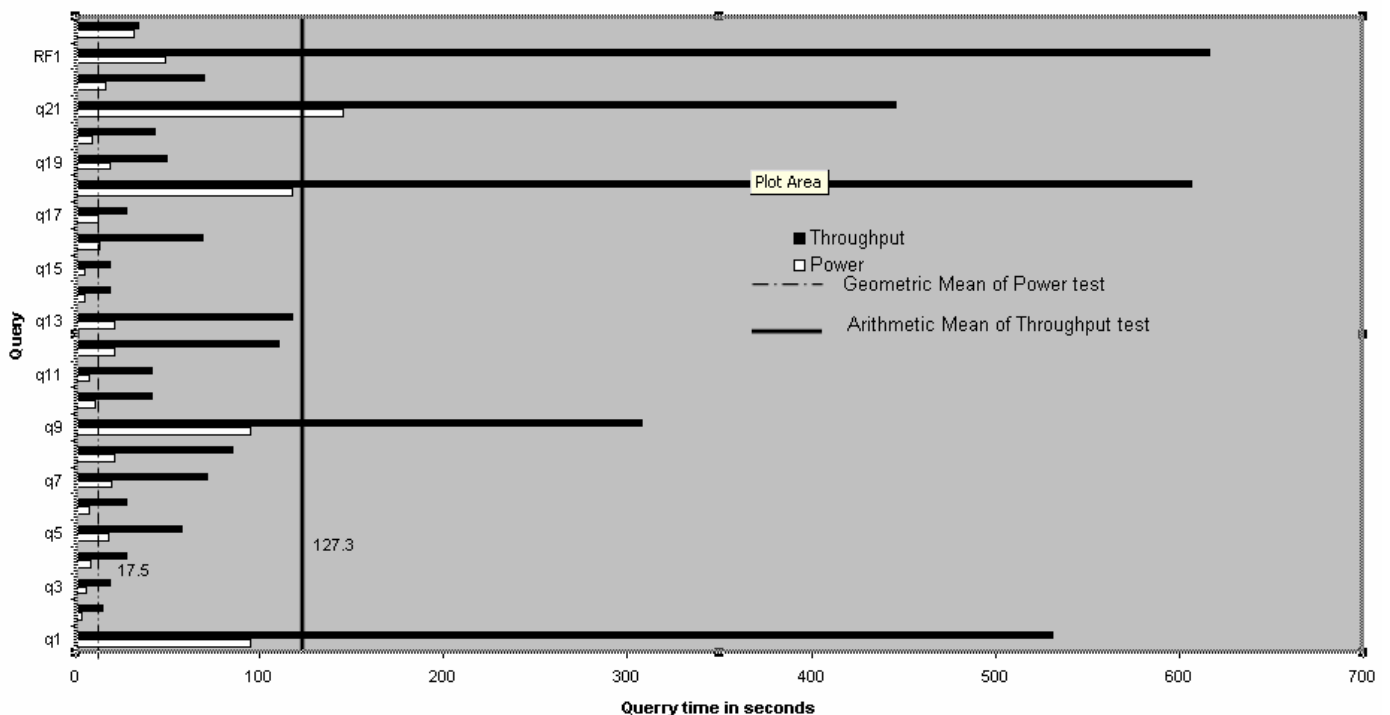
Database Size
100GB

Database Manager
 SQL Server 2005 Enterprise x64
 Edition™ SP1

Operating System
 Microsoft Windows Server
 2003 Enterprise x64
 Edition™ SP1

Other Software
 Visual C++ Standard Edition
 Visual Basic 2003 .Net
 Professional

Availability Date
Dec 31, 2006



Database Load Time
 0:56:13

Total Disk/Database Size
 62.8

Load Includes Backup
 Y

RAID (Base tables only)
 N

RAID (Base tables and auxiliary data structures)
 N

RAID (Everything)
 N

System Configuration : 1 node
Processors (per node) : 2x Intel® Xeon™ X5355 QC 2.66GHz w/ 8M Cache
Memory: (per node): 48GB RAM
Disk Drives: 180 – 36GB 15k SAS HDD & 4 – 73GB 10k SAS HDD

“Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.)”

| Dell | | PowerEdge PE2900 | | | TPC-H REV 2.3 EXECUTIVE SUMMARY | | |
|--|-------------|------------------|--------------------------------------|-----------------|---------------------------------|--------------------|--|
| | | Server | | | Report Date: 27-Nov-06 | | |
| | | | | | Revision Date: 07-June-07 | | |
| Description | Part Number | Third Party | Unit Price | Qty | Extended Price | 3 yr. Maint. Price | |
| | | Brand | Pricing | | | | |
| Server Hardware | | | | | | | |
| PE2900,QC XEON X5355,8MB,2.66GZ | 222-7262 | | 1,452.00 | 1 | \$1,452.00 | \$320.00 | |
| & 2 Broadcom NICs | | | | | | | |
| DUAL XEON X5355,8MB,2.66GZ | 311-6941 | | 1,399.00 | 1 | \$1,399.00 | | |
| 48GB 667MHz(12x4GB),2R | 311-6328 | | 11,798.00 | 1 | \$11,798.00 | | |
| PERC5/i,Integrated | 341-3018 | | \$299.00 | 1 | \$299.00 | | |
| PERC5/E SAS RAID, 2X4 EXTERNAL | 341-3023 | | \$799.00 | 4 | \$3,196.00 | | |
| 73GB,3GBPS,SAS,3.5IN,10K | 341-3028 | | \$299.00 | 4 | \$1,196.00 | | |
| DELL E157FP,15 IN,15.0 VIS | 320-5090 | | \$189.00 | 1 | \$189.00 | | |
| | | | | Subtotal | \$19,529.00 | \$320.00 | |
| PowerVault Disk Subsystem | | | | | | | |
| PV MD1000,RACK,3U,15 BAY,LBZL | 222-2299 | | 2,680.00 | 12 | \$32,160.00 | \$19,776.00 | |
| TWO ENCL MGT MODULES, SAS/SATA | 420-5927 | | \$345.83 | 12 | \$4,149.96 | | |
| 36GB,3GBPS,SAS,3.5IN,15K | 341-2816 | | \$249.00 | 180 | \$44,820.00 | | |
| RACK-111/24U/Dell | A0213544 | | \$479.95 | 1 | \$479.95 | | |
| | | | | Subtotal | \$81,609.91 | \$19,776.00 | |
| Server Software | | | | | | | |
| SQL Server 2005 Enterprise x64 Edition ** | 810-04793 | Microsoft | 1 | \$8,487.00 | \$8,487.00 | | |
| SQL Server 2005 Client Licence ** | 359-01911 | Microsoft | 1 | 156 | \$3,900.00 | | |
| Windows Server 2003 Enterprise x64 Server ** | P72-00274 | Microsoft | 1 | \$2,334.00 | \$2,334.00 | | |
| Visual C++ Standard Edition ** | 254-00170 | Microsoft | 1 | \$109.00 | \$109.00 | | |
| Visual Basic 2003 .Net Professional | 046-00856 | Microsoft | 1 | \$109.00 | \$109.00 | | |
| Professional Support (1 Incident) | | Microsoft | 1 | \$245.00 | | \$245.00 | |
| | | | | Subtotal | \$14,939.00 | \$245.00 | |
| All components from Dell are discounted 16% based on total dollar volume of this configuration. | | | Other Discounts (16%) | | \$19,397.59 | | |
| | | | | Total | \$96,680 | \$20,341 | |
| Notes: * Maint. included in PowerVault MD1000 disk pod | | | Three-Year Cost of Ownership: | | \$117,022 | USD | |
| ** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server | | | | | | | |
| Pricing: NIO = These components are Not Immediately Orderable; 1 = Microsoft, all others are Dell | | | QphH@100G | | 15,723.9 | | |
| Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 365085964 | | | | | | | |
| as a complex quote. | | | | | | | |
| Audited by Lorna Livingtree, Performance Metrics Inc. | | | \$ / QphH@100G: | | \$7.45 | USD | |
| <i>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 the stated prices are not available according to these items, please inform the TPC at pricing@tpc.org.</i> | | | | | | | |



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Numerical Quantities Summary

Measurement Results:

| | |
|--|---------------------|
| Database Scale Factor | 100 |
| Total Data Storage/Database Size | 62.8 |
| Start of Database Load | 2006-11-20 12:15:26 |
| End of Database Load | 2006-11-20 13:11:39 |
| Database Load Time | 0:56:13 |
| Query Streams for Throughput Test | 5 |
| TPC-H Power | 20,587.9 |
| TPC-H Throughput | 12,009.1 |
| TPC-H Composite Query-per-Hour Metric (QphH@100GB) | 15,723.9 |
| Total System Price Over 3 Years | \$117,022 |
| TPC-H Price Performance Metric (\$/QphH@100GB) | \$7.45 |

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 3,297.5 seconds

Duration of stream execution:

| | Seed | Start Date/Time | End Date/Time | Duration |
|------------------|------------|-------------------|-------------------|----------|
| Stream00 | 1120131139 | 11/20/06 15:19:35 | 11/20/06 15:30:57 | 0:11:22 |
| Stream01 | 1120131140 | 11/20/06 15:31:31 | 11/20/06 16:18:37 | 0:47:05 |
| Stream02 | 1120131141 | 11/20/06 15:31:32 | 11/20/06 16:19:33 | 0:48:01 |
| Stream03 | 1120131142 | 11/20/06 15:31:32 | 11/20/06 16:18:36 | 0:47:05 |
| Stream04 | 1120131143 | 11/20/06 15:31:32 | 11/20/06 16:17:03 | 0:45:31 |
| Stream05 | 1120131144 | 11/20/06 15:31:32 | 11/20/06 16:17:13 | 0:45:41 |
| | | | | |
| Refresh00 | | 11/20/06 15:18:45 | 11/20/06 15:19:34 | 0:00:49 |
| | | 11/20/06 15:30:58 | 11/20/06 15:31:29 | 0:00:32 |
| Refresh01 | | 11/20/06 15:31:31 | 11/20/06 16:20:51 | 0:49:20 |
| Refresh02 | | 11/20/06 16:20:57 | 11/20/06 16:22:16 | 0:01:19 |
| Refresh03 | | 11/20/06 16:22:22 | 11/20/06 16:23:41 | 0:01:20 |
| Refresh04 | | 11/20/06 16:23:46 | 11/20/06 16:25:03 | 0:01:17 |
| Refresh05 | | 11/20/06 16:25:12 | 11/20/06 16:26:29 | 0:01:17 |



Numerical Quantities Summary

Timing Intervals in Seconds:

| Query | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|----------|-------|-------|------|-------|-------|------|--------|-------|
| Stream00 | 94.9 | 2.9 | 5.7 | 7.8 | 17.5 | 7.1 | 19.8 | 21.0 |
| Stream01 | 519.1 | 14.6 | 19.5 | 12.7 | 51.0 | 24.3 | 70.3 | 90.2 |
| Stream02 | 515.8 | 13.7 | 20.8 | 33.2 | 51.9 | 40.6 | 69.5 | 78.6 |
| Stream03 | 552.3 | 12.3 | 10.4 | 36.3 | 62.0 | 29.4 | 81.5 | 102.6 |
| Stream04 | 530.4 | 16.3 | 23.6 | 26.2 | 70.6 | 21.3 | 67.0 | 86.3 |
| Stream05 | 536.9 | 16.5 | 20.4 | 29.8 | 53.1 | 22.3 | 69.7 | 67.9 |
| Min Qi | 515.8 | 12.3 | 10.4 | 12.7 | 51.0 | 21.3 | 67.0 | 67.9 |
| Max Qi | 552.3 | 16.5 | 23.6 | 36.3 | 70.6 | 40.6 | 81.5 | 102.6 |
| Avg Qi | 530.9 | 14.7 | 18.9 | 27.6 | 57.7 | 27.6 | 71.6 | 85.1 |
| Query | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 |
| Stream00 | 95.2 | 10.3 | 7.2 | 21.0 | 30.8 | 4.5 | 4.8 | 13.1 |
| Stream01 | 278.4 | 41.2 | 41.6 | 120.5 | 118.5 | 17.5 | 16.1 | 126.4 |
| Stream02 | 536.5 | 45.0 | 43.8 | 136.0 | 117.8 | 22.5 | 17.5 | 61.8 |
| Stream03 | 239.8 | 33.3 | 35.8 | 65.8 | 128.1 | 18.3 | 16.0 | 43.8 |
| Stream04 | 228.6 | 44.1 | 44.9 | 114.3 | 114.2 | 19.5 | 21.2 | 58.3 |
| Stream05 | 257.0 | 41.5 | 40.0 | 115.8 | 108.5 | 16.8 | 19.0 | 56.7 |
| Min Qi | 228.6 | 33.3 | 35.8 | 65.8 | 108.5 | 16.8 | 16.0 | 43.8 |
| Max Qi | 536.5 | 45.0 | 44.9 | 136.0 | 128.1 | 22.5 | 21.2 | 126.4 |
| Avg Qi | 308.1 | 41.0 | 41.2 | 110.5 | 117.4 | 18.9 | 18.0 | 69.4 |
| Query | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | RF1 | RF2 |
| Stream00 | 11.8 | 117.5 | 18.4 | 8.7 | 145.2 | 16.5 | 48.8 | 31.5 |
| Stream01 | 24.1 | 578.4 | 44.9 | 40.9 | 514.2 | 60.9 | 2922.5 | 32.6 |
| Stream02 | 31.3 | 573.5 | 55.1 | 45.0 | 300.6 | 70.8 | 40.2 | 35.2 |
| Stream03 | 27.3 | 738.4 | 52.3 | 41.8 | 430.4 | 66.7 | 41.2 | 34.9 |
| Stream04 | 28.2 | 568.6 | 48.1 | 40.0 | 471.7 | 88.0 | 40.3 | 32.8 |
| Stream05 | 25.5 | 574.5 | 48.2 | 46.1 | 513.7 | 60.8 | 38.5 | 34.7 |
| Min Qi | 24.1 | 568.6 | 44.9 | 40.0 | 300.6 | 60.8 | 38.5 | 32.6 |
| Max Qi | 31.3 | 738.4 | 55.1 | 46.1 | 514.2 | 88.0 | 2922.5 | 35.2 |
| Avg Qi | 27.3 | 606.7 | 49.7 | 42.8 | 446.1 | 69.4 | 616.5 | 34.0 |