

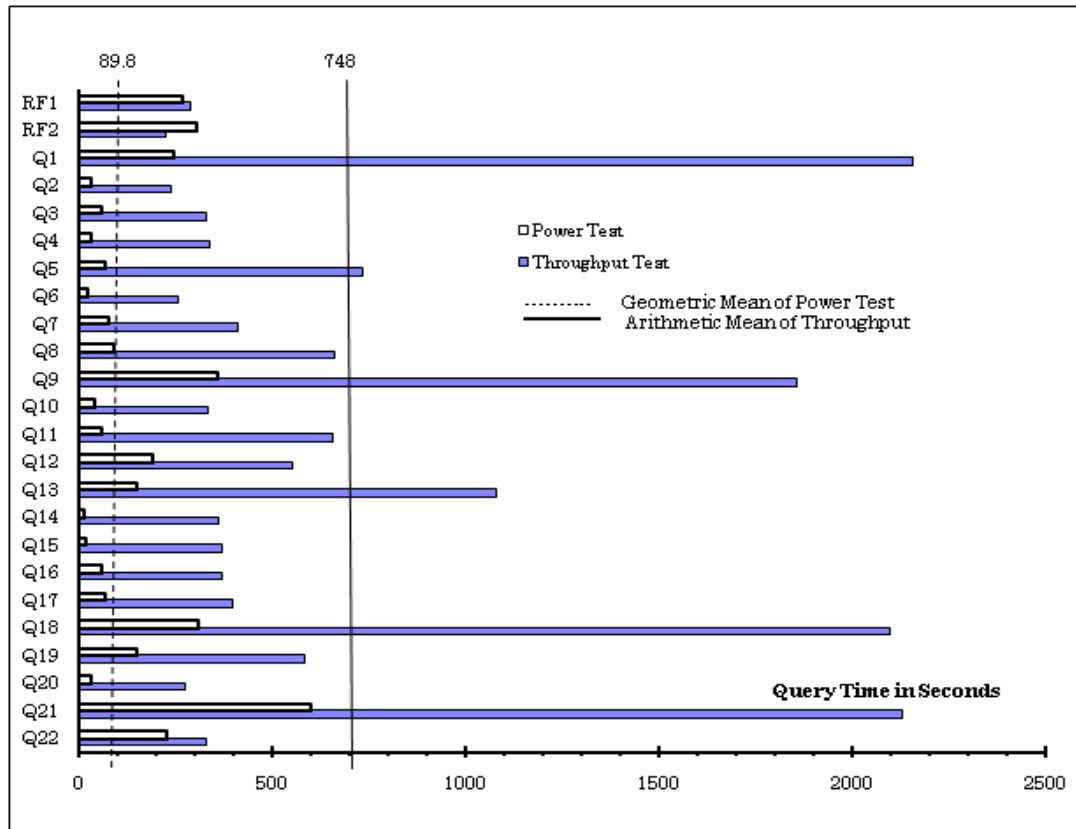


ES7000 Model 7600R Enterprise Server (16s)

TPC-H Rev. 2.8.0
TPC Pricing 1.5

Report Date
November 2, 2009

| | | | | | |
|--------------------------|---|--|-----------------------|--------------------------|--|
| Total System Cost | | Composite Query per Hour Rating | | Price Performance | |
| \$2,162,895 USD | | 102,778.2 QphH @ 3000GB | | \$21.05 / QphH @ 3000GB | |
| Database Size | Database Manager | Operating System | Other Software | Availability Date | |
| 3000 GB* | Microsoft SQL Server 2008 R2 Datacenter Edition | Microsoft Windows Server 2008 R2, Datacenter Edition | | May 6, 2010 | |



| | | | | |
|--|--|--|---|----------------------|
| Database Load Time = 11:53:20 | | Load included backup: Y | Total Data Storage / Database Size = 28.71 | |
| RAID (Base tables): N | | RAID (Base tables and Auxiliary Data Structures): N | | RAID (All): N |
| System Components | | | System Total | Per Node |
| Nodes | | | 1 | n.a. |
| Processors/Cores/Threads: Intel® Hex Core Xeon™ X7460 2.6GHz w/ 16MB L3 Cache | | | 16/96/96 | 16/96/96 |
| Memory (in GB) | | | 1024 | 1024 |
| Inbuilt 1Gb Eth. Contrls. (1 used) | | | 8 | 8 |
| Disk Controllers | | PCIe Fibre Channel | 24 | 24 |
| | | PCI SAS RAID (boot) | 1 | 1 |
| Disk Drives | | 73GB FC 15K rpm | 555 | 555 |
| | | 146GB FC 15K rpm | 359 | 359 |
| | | 73GB SAS 10K rpm (boot media) | 2 | 2 |
| Total Disk Storage - formatted capacity | | | 86,118 GB | 86,118 GB |
| * Database size includes only raw data (eg. no temp, index, redundant storage space, etc.) | | | | |

| UNISYS | ES7000 Model 7600R Enterprise Server (16s) | | TPC-H Rev. 2.8.0 TPC Pricing 1.5 | | | |
|--|---|--------------|-------------------------------------|------|--|-------------------|
| | | | Report Date November 2, 2009 | | | |
| Description | Part Number | Price Source | Unit Price | Qty. | Extended Price | 3-yr.Maint. Price |
| Server Hardware: | | | | | | |
| ES7000 Model 7600R with 64GB | ES7764163-100 | 1 | \$145,290 | 1 | \$145,290 | \$6,768 |
| ES7000 7600R Installation Accessory Kit | ES790001-IAK | 1 | \$100 | 1 | \$100 | |
| Memory Initial 16GB with 8 GB DIMMs | FAC7102803-ICA | 1 | \$2,378 | 4 | \$9,512 | |
| Memory Expansion - 16GB | FAC7102803-16G | 1 | \$1,525 | 56 | \$85,400 | |
| Emulex LPe12002 | NU9233231-HOD | 1 | \$3,986 | 24 | \$95,664 | |
| Internal RAID + 2 x 73GB Hard Drive | FAC7760731-HDK | 1 | \$2,403 | 1 | \$2,403 | |
| RCK:KBRD/MOUSE/17"MON | ES70006-UIF | 1 | \$675 | 1 | \$675 | |
| Server Subtotal | | | | | \$339,044 | \$6,768 |
| Storage Hardware: | | | | | | |
| Dual RAID Controller for Log | RTS422880-T2 | 1 | \$15,840 | 1 | \$15,840 | |
| 73GB Disk Drive | RTS4307315-4FH | S | \$484 | 555 | \$268,620 | |
| 146GB Disk Drive (ea) | RTS4314615-4FH | 1 | \$660 | 360 | \$237,600 | |
| 146GB Disk Drives for Log (15 Pack) | RTS4314615-P15 | 1 | \$18,695 | 1 | \$18,695 | |
| UPS for Log Enclosure | UPS120 | 5 | \$1,000 | 1 | \$1,000 | |
| Optical Transceiver - 60 Pack | RTS400150-P60 | 1 | \$6,321 | 1 | \$6,321 | |
| Optical Transceiver - ea | RTS400150-SFP | 1 | \$110 | 2 | \$220 | |
| RAID Controller 1x1 - Style 1 - 10 Pack | RTS4228801-P10 | 1 | \$80,816 | 1 | \$80,816 | |
| RAID Controller 1x1 - Style 1 - 15 Pack | RTS4228801-P15 | 1 | \$104,277 | 2 | \$208,554 | |
| RAID Controller 1x1 - Style 2 - 5 Pack | RTS4228802-P05 | 1 | \$45,459 | 1 | \$45,459 | |
| RAID Controller 1x1 - Style 2 - 15 Pack | RTS4228802-P15 | 1 | \$106,071 | 1 | \$106,071 | |
| Snap in 1U Filler | RCK4219421-1UP | 1 | \$20 | 0 | \$0 | |
| Snap in 3 U Filler | RCK4219421-3UP | 1 | \$22 | 3 | \$66 | |
| Power Strip | PWR4243001-SD | 1 | \$392 | 2 | \$784 | |
| Power Strip | PWR4243001-SVD | 1 | \$403 | 2 | \$806 | |
| 42U 19" Rack | RCK4219421-FSS | 1 | \$2,769 | 1 | \$2,769 | |
| Rack Trim Kit | RCK4219421-OTK | 1 | \$350 | 1 | \$350 | |
| 42U Rack - No Doors | RM421940-FRM | 1 | \$1,286 | 4 | \$5,143 | |
| 8 Outlet Power Strip | SFR9-PWR | 1 | \$170 | 18 | \$3,060 | |
| Power Cord | RTS400740-CBL | 1 | \$11 | 122 | \$1,342 | |
| 24-port 8Gb FC switch | HSC3043608-8GB | 1 | \$13,919 | 2 | \$27,838 | \$10,176 |
| Universal slide for switch | HSC3041001-BRM | 1 | \$340 | 2 | \$680 | |
| Fibre Channel Switch Additional ports | STO92214-INS | 1 | \$65 | 32 | \$2,080 | |
| Fiber Channel Cables 10M - incl 2 spares | GCFAZLLM10-M | 3 | \$15 | 79 | \$1,185 | |
| 16 Port Ethernet Switch (Netgear) incl 2 spares | USE1936-LC6 | 4 | \$55 | 7 | \$385 | |
| Ethernet Cables - incl 2 spares | GCP0888950-BL | 3 | \$5 | 68 | \$340 | |
| Storage Subtotal | | | | | \$1,036,024 | \$10,176 |
| Server Software: | | | | | | |
| Windows 2008 R2 Server Datacenter Edition | P71-06367 | 2 | \$2,357 | 16 | \$37,712 | |
| SQL Server 2008 R2 Datacenter Edition | * | 2 | \$45,807 | 16 | \$732,912 | |
| Microsoft Problem Resolution Svc | N/A | 2 | \$259 | 1 | | \$259 |
| Software Subtotal | | | | | \$770,624 | \$259 |
| Unisys Product Pricing (List Pricing) - Michael Heifner (215)-986-4757 (where Price Source = 1 or S) | | | | | | |
| Total USD | | | | | \$2,145,692 | \$17,203 |
| Notes: | | | | | 3-Year Cost of Ownership: \$2,162,895 USD | |
| 1. * 10% or minimum 2 spares are added in place of onsite service. | | | | | QphH @ 3000GB: 102,778.2 | |
| 2. HW & SW maintenance at 24 x 7 w/ 4 hr. max. response time for spares. | | | | | \$ / QphH@3000GB: \$21.05 USD | |
| 3. Price Source: 1 = Unisys Product Price, Unisys Maintenance Price | | | | | | |
| 2 = Microsoft 3 = CableSys 4 = NewEgg 5 = iQstor | | | | | | |
| S One or more components of the measured configuration have been substituted in the Pricing Configuration. See the FDR for details. | | | | | | |
| * This component is not immediately orderable. See the FDR for more | | | | | | |
| Benchmark results and test methodology audited by Lorna Livingtree of Performance Metrics, Inc. | | | | | | |
| 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 assumption 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 benchmarks specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank You. | | | | | | |

Numerical Quantities Summary

Measurement Results

| | |
|--|---------------------|
| Scale Factor | 3000 GB |
| Total Data Storage / Database Size | 28.71 |
| Start of Database Load | 10/19/2009 3:48:05 |
| End of Database Load | 10/19/2009 15:41:25 |
| Database Load Time | 11:53:20 |
| Query Streams for Throughput Test | 8 |
| TPC-H Power | 120,254.8 |
| TPC-H Throughput | 87,841.4 |
| Composite Query per Hour Rating (QpH@3000GB) | 102,778.2 |
| Total System Price Over 3 Years | \$2,162,895 USD |
| TPC-H Price Performance Metric (\$/QpH@3000GB) | \$21.05 USD |

Measurement Intervals

| | |
|--|---------------|
| Measurement Interval in Throughput Test (Ts) | 21639 seconds |
|--|---------------|

Duration of Stream Execution:

| | Seed | Query Start Date/Time | RF1 Start Date/Time | RF2 Start Date/Time | Duration |
|----------|------------|-----------------------|---------------------|---------------------|----------|
| Stream 0 | 1019154125 | 10/19/09 23:35:36 | 10/19/09 23:28:37 | 10/20/09 0:23:59 | 00:59:50 |
| | | 10/20/09 0:23:59 | 10/19/09 23:33:42 | 10/20/09 0:28:27 | |
| Stream 1 | 1019154126 | 10/20/09 0:28:30 | 10/20/09 5:20:45 | 10/20/09 5:26:21 | 5:01:47 |
| | | 10/20/09 4:46:52 | 10/20/09 5:26:20 | 10/20/09 5:30:17 | |
| Stream 2 | 1019154127 | 10/20/09 0:28:30 | 10/20/09 5:30:19 | 10/20/09 5:34:47 | 5:10:05 |
| | | 10/20/09 5:20:45 | 10/20/09 5:34:47 | 10/20/09 5:38:35 | |
| Stream 3 | 1019154128 | 10/20/09 0:28:30 | 10/20/09 5:38:37 | 10/20/09 5:43:19 | 5:18:31 |
| | | 10/20/09 5:10:56 | 10/20/09 5:43:19 | 10/20/09 5:47:01 | |
| Stream 4 | 1019154129 | 10/20/09 0:28:30 | 10/20/09 5:47:03 | 10/20/09 5:51:43 | 5:27:01 |
| | | 10/20/09 5:07:05 | 10/20/09 5:51:43 | 10/20/09 5:55:31 | |
| Stream 5 | 1019154130 | 10/20/09 0:28:30 | 10/20/09 5:55:33 | 10/20/09 6:00:15 | 5:35:29 |
| | | 10/20/09 4:44:20 | 10/20/09 6:00:15 | 10/20/09 6:03:59 | |
| Stream 6 | 1019154131 | 10/20/09 0:28:30 | 10/20/09 6:04:02 | 10/20/09 6:08:45 | 5:43:50 |
| | | 10/20/09 5:19:23 | 10/20/09 6:08:44 | 10/20/09 6:12:20 | |
| Stream 7 | 1019154132 | 10/20/09 0:28:30 | 10/20/09 6:12:23 | 10/20/09 6:17:01 | 5:52:12 |
| | | 10/20/09 5:05:46 | 10/20/09 6:17:00 | 10/20/09 6:20:42 | |
| Stream 8 | 1019154133 | 10/20/09 0:28:30 | 10/20/09 6:20:45 | 10/20/09 6:25:28 | 6:00:39 |
| | | 10/20/09 4:47:01 | 10/20/09 6:25:27 | 10/20/09 6:29:09 | |

TPC-H Timing Intervals (in seconds):

| Query | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Stream 0 | 246.1 | 31.3 | 59.8 | 32.9 | 66.4 | 23.6 | 78.6 | 89.0 |
| Stream 1 | 1570.5 | 598.7 | 413.3 | 310.0 | 419.6 | 525.5 | 488.9 | 751.2 |
| Stream 2 | 2424.4 | 154.3 | 257.5 | 577.4 | 383.1 | 183.6 | 529.5 | 876.9 |
| Stream 3 | 2678.5 | 125.8 | 183.8 | 192.2 | 1465.1 | 182.0 | 525.7 | 521.5 |
| Stream 4 | 1848.8 | 139.0 | 257.6 | 662.9 | 382.4 | 193.6 | 319.9 | 384.0 |
| Stream 5 | 1555.6 | 343.3 | 292.8 | 346.7 | 321.2 | 184.5 | 387.4 | 431.4 |
| Stream 6 | 1515.9 | 247.1 | 518.8 | 179.1 | 898.0 | 460.1 | 472.8 | 1171.4 |
| Stream 7 | 2654.2 | 156.5 | 367.7 | 206.6 | 1736.4 | 109.0 | 117.0 | 424.3 |
| Stream 8 | 2982.8 | 114.8 | 342.2 | 199.0 | 234.0 | 189.3 | 419.9 | 713.6 |
| Min Qi | 1515.9 | 114.8 | 183.8 | 179.1 | 234.0 | 109.0 | 117.0 | 384.0 |
| Max Qi | 2982.8 | 598.7 | 518.8 | 662.9 | 1736.4 | 525.5 | 529.5 | 1171.4 |
| Avg Qi | 2153.8 | 234.9 | 329.2 | 334.2 | 730.0 | 253.5 | 407.6 | 659.3 |
| Query | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 |
| Stream 0 | 361.3 | 40.8 | 60.7 | 191.1 | 149.0 | 15.0 | 19.3 | 57.9 |
| Stream 1 | 1540.8 | 485.8 | 1020.4 | 794.0 | 893.9 | 64.0 | 120.5 | 470.7 |
| Stream 2 | 2624.6 | 415.5 | 383.7 | 1033.7 | 697.9 | 1180.1 | 122.7 | 294.1 |
| Stream 3 | 1286.2 | 228.2 | 432.2 | 277.9 | 533.0 | 74.7 | 390.9 | 227.8 |
| Stream 4 | 2209.6 | 235.4 | 1176.1 | 373.7 | 1142.1 | 71.4 | 491.2 | 541.9 |
| Stream 5 | 1819.9 | 408.9 | 596.8 | 311.1 | 878.5 | 84.8 | 155.6 | 580.6 |
| Stream 6 | 2296.2 | 239.1 | 551.7 | 526.3 | 933.5 | 1242.0 | 1067.8 | 418.9 |
| Stream 7 | 2033.5 | 117.2 | 650.5 | 449.6 | 1900.6 | 46.8 | 78.2 | 217.0 |
| Stream 8 | 1009.7 | 510.3 | 420.7 | 637.3 | 1625.6 | 102.9 | 501.5 | 202.7 |
| Min Qi | 1009.7 | 117.2 | 383.7 | 277.9 | 533.0 | 46.8 | 78.2 | 202.7 |
| Max Qi | 2624.6 | 510.3 | 1176.1 | 1033.7 | 1900.6 | 1242.0 | 1067.8 | 580.6 |
| Avg Qi | 1852.6 | 330.1 | 654.0 | 550.5 | 1075.6 | 358.3 | 366.1 | 369.2 |
| Query | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | RF1 | RF2 |
| Stream 0 | 67.1 | 307.0 | 149.2 | 31.2 | 598.0 | 227.8 | 305.1 | 268.1 |
| Stream 1 | 305.1 | 1897.0 | 519.7 | 303.6 | 1674.0 | 334.7 | 334.8 | 236.4 |
| Stream 2 | 392.4 | 2597.0 | 462.1 | 278.0 | 1345.2 | 321.0 | 267.5 | 227.7 |
| Stream 3 | 196.5 | 2779.3 | 688.1 | 353.8 | 3250.0 | 352.9 | 281.7 | 221.3 |
| Stream 4 | 251.2 | 1656.3 | 579.3 | 110.3 | 3460.3 | 227.9 | 279.9 | 227.3 |
| Stream 5 | 1211.5 | 1981.9 | 1028.5 | 437.1 | 1674.2 | 317.8 | 281.6 | 224.0 |
| Stream 6 | 148.5 | 1941.6 | 525.8 | 139.1 | 1526.9 | 432.3 | 282.5 | 215.3 |
| Stream 7 | 277.6 | 1704.7 | 377.0 | 248.3 | 2454.6 | 309.1 | 277.7 | 221.9 |
| Stream 8 | 364.4 | 2205.9 | 487.9 | 313.7 | 1617.8 | 314.9 | 282.5 | 221.3 |
| Min Qi | 148.5 | 1656.3 | 377.0 | 110.3 | 1345.2 | 227.9 | 267.5 | 215.3 |
| Max Qi | 1211.5 | 2779.3 | 1028.5 | 437.1 | 3460.3 | 432.3 | 334.8 | 236.4 |
| Avg Qi | 393.4 | 2095.5 | 583.6 | 273.0 | 2125.4 | 326.3 | 286.0 | 224.4 |