



**Sun Fire™ x4600 Server  
with SQL Server 2008  
Enterprise x64 Edition™ SP1**

TPC-H Rev. 2.8.0

Report Date: July 6, 2009

Total System Cost  
\$154,284.19

**55,157.5**  
QphH@300GB

Price/Performance  
**\$2.80** per QphH@300GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

**300GB**

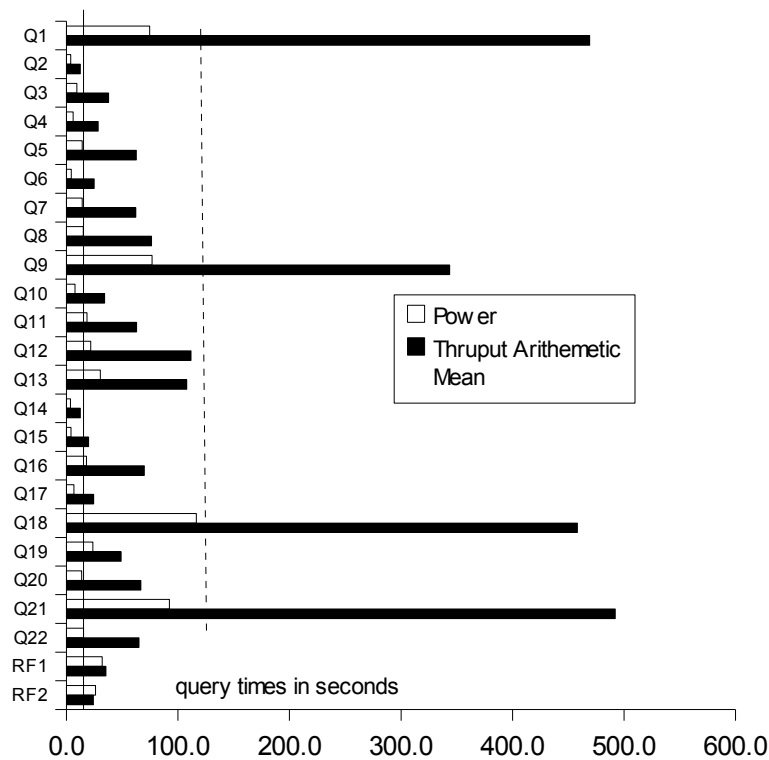
**SQL Server 2008  
Enterprise x64  
Edition™ SP1**

**Microsoft  
Windows Server  
2008 Enterprise  
x64 Edition™ SP1**

**MS Visual  
Studio Standard**

**July 6, 2009**

geometric mean = 16.1      arithmetic mean = 122.3



Database Load Time = 17H29M

Load Includes Backup: Y

Total Storage/Database Size=76.82

RAID (Base tables): N

RAID (Base tables and auxiliary data structures): N

RAID (All): N

**System Configuration:**

- 1 x SunFire x4600 Server, each server with
  - 8 x AMD Opteron model 8384 2.7GHz processors (each processor is 1 chip, 4 cores, 4 threads)
  - 256 GB memory
  - 3 x 73,000,000,000 bytes (15K RPM) internal SAS disks
- 14 x J4200 SAS storage arrays, each consisting of 12 x 143,000,000,000 bytes 15K rpm SAS disks

**Total Storage:** 23,047.4 GB

(in this calculation 1 GB is defined as 1024 \* 1024 \* 1024) bytes



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| Description   | Part Number      | Source | Unit Price        | Qty | Ext. Price        | 3 Yr. maint      |
|---|------------------|--------|-------------------|-----|-------------------|------------------|
| <b>Server Hardware</b>  |                  |        |                   |     |                   |                  |
| SunFire X4600 M2 XATO Be w ith 4x1133W power supplies, also includes DVD-RW drive and slide rail kit. | A67-AVM2-1133    | 1      | 4,900.00          | 1   | 4,900.00          |                  |
| 73GB 15Krpm 2.5inch SAS hard disk drive   | RA-SS2CD-73G15K  | 1      | 359.00            | 3   | 1,077.00          |                  |
| X4600 M2 quad core processor board w ith 1x 8384 (2.7GHz Quad Core, 75W)                              | 8476A            | 1      | 4,000.00          | 8   | 32,000.00         |                  |
| 8 GB Memory kit DDR2-667 Registered ECC DIMMS (2x4GB)   | 8098A            | 1      | 400.00            | 32  | 12,800.00         |                  |
| Sun Storage™ 8-port external SAS PCI-Express HBA  | SG-XPCIE8SAS-E-Z | 1      | 550.00            | 3   | 1,650.00          |                  |
| Sun Storage™ 8-port external SAS PCI-Express HBA X-option   | SG-XPCIE8SAS-E-Z | 1      | 550.00            | 3   | 1,650.00          |                  |
| Server Discount (30%)   |                  | 1      |                   |     | -16,223.10        |                  |
| Sun GOLD Support.   |                  |        |                   |     |                   |                  |
| 24x7 hardware (chassis) only support w ith 4 hour response  | WU-A67M-3G       | 1      | 999.23            | 1   |                   | 999.23           |
| Sun GOLD Support.   |                  |        |                   |     |                   |                  |
| 24x7 hardware only support w ith 4 hour response  | WU-A67M1WY-3G    | 1      | 752.82            | 8   |                   | 6,022.56         |
| <b>Server Hardware Subtotal</b>   |                  |        |                   |     | <b>37,853.90</b>  | <b>7,021.79</b>  |
| <b>Storage</b>  |                  |        |                   |     |                   |                  |
| Sun™ Storage J4200 array Rack-Ready Chassis   | TA4200R00A10D1   | 1      | 2,675.00          | 14  | 37,450.00         |                  |
| 146GB 15K rpm SAS 3.5inch Hard disk drive   | TA-SS1NJ-146G15K | 1      | 359.00            | 168 | 60,312.00         |                  |
| Sun Storage 2.0m, mini, shielded, SAS cable   | XTA-2.0M-SAS     | 1      | 150.00            | 14  | 2,100.00          |                  |
| Storage discount (18%)  |                  | 1      |                   |     | -17,975.16        |                  |
| Sun GOLD Support.   |                  |        |                   |     |                   |                  |
| 24x7 hardware only support w ith 4 hour response  | WU-STJ4200-3G    | 1      | 799.19            | 14  |                   | 11,188.66        |
| <b>Storage Subtotal</b>   |                  |        |                   |     | <b>81,886.84</b>  | <b>11,188.66</b> |
| <b>Server Software</b>  |                  |        |                   |     |                   |                  |
| Microsoft Windows Server 2008 Enterprise Edition (x64) SP1  | P72-03168        | 2      | 2,310.00          | 1   | 2,310.00          |                  |
| Microsoft SQL Server 2008 Enterprise x64 Edition w ith 25 CALs  | 810-07578        | 2      | 8,318.00          | 1   | 8,318.00          | 245.00           |
| Microsoft SQL Server 2008 Client License  | 359-01912        | 2      | 156.00            | 35  | 5,460.00          |                  |
| Microsoft Visual Studio Standard 2005   | 127-00012        | 2      | 250.00            | 1   | 250.00            |                  |
| <b>Server Software Subtotal</b>   |                  |        |                   |     | <b>16,088.00</b>  | <b>245.00</b>    |
|   |                  |        | <b>Total</b>      |     | <b>135,828.74</b> | <b>18,455.45</b> |
|   |                  |        | <b>3 Yr. Cost</b> |     | <b>154,284.19</b> |                  |
|   |                  |        | QphH @300GB       |     | 55,158            |                  |
|   |                  |        | \$/QphH @300GB    |     | \$2.80            |                  |

- Sources**
1. Sun Microsystems
  2. Microsoft Corporation

Audited by: Francois Raab, InfoSizing, Inc. (www.sizing.com)

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the standard components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchase 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 terms, please inform the TPC at pricing@tpc.org. Thank you.



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### Numerical Quantities

#### Measurement Results:

|   |                |
|---|----------------|
| Database Scale Factor                             | = 300GB        |
| Total Data Storage / Database Size                | = 76.82        |
| Start of database load time                       | = 12:46:38     |
| End of database load time                         | = 6:15:55      |
| Database Load Time                                | = 17H29M       |
| Query Streams for Throughput Test                 | = 6            |
| TPC-H Power                                       | = 67,095.6     |
| TPC-H Throughput                                  | = 45,343.5     |
| TPC-H Composite Query-per-Hour Rating (QpH@300GB) | = 55,157.5     |
| Total System Price Over 3 Years                   | = \$154,284.19 |
| TPC-H Price/Performance Metric (\$/QpH@300GB)     | = \$2.80       |

#### Measurement Intervals:

|  |                 |
|--|-----------------|
| Measurement Interval in Throughput Test (Ts) | = 3,144 seconds |
|--|-----------------|

#### Duration of Stream Execution:

| Stream ID | Seed      | Start Date | Start Time | End Date  | End Time   | Duration |
|-----------|-----------|------------|------------|-----------|------------|----------|
| Stream 0  | 612061555 | 6/12/2009  | 8:07:13 AM | 6/12/2009 | 8:19:05 AM | 11m52s   |
| Stream 1  | 612061556 | 6/12/2009  | 8:19:05 AM | 6/12/2009 | 9:03:46 AM | 44m41s   |
| Stream 2  | 612061557 | 6/12/2009  | 8:19:05 AM | 6/12/2009 | 9:04:38 AM | 45m32s   |
| Stream 3  | 612061558 | 6/12/2009  | 8:19:06 AM | 6/12/2009 | 9:04:09 AM | 45m03s   |
| Stream 4  | 612061559 | 6/12/2009  | 8:19:06 AM | 6/12/2009 | 9:05:23 AM | 46m18s   |
| Stream 5  | 612061560 | 6/12/2009  | 8:19:06 AM | 6/12/2009 | 9:02:08 AM | 43m03s   |
| Stream6   | 612061561 | 6/12/2009  | 8:19:06 AM | 6/12/2009 | 9:03:31 AM | 44m25s   |
| refreshes |           | 6/12/2009  | 9:05:23 AM | 6/12/2009 | 9:11:29 AM | 6m5s     |



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TPC-H Timing Intervals (in seconds)

| Stream ID | Q1    | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9    | Q10  | Q11  | Q12   |
|-----------|-------|------|------|------|------|------|------|------|-------|------|------|-------|
| 00        | 74.5  | 3.7  | 9.3  | 6.0  | 13.9 | 4.2  | 14.1 | 15.1 | 76.8  | 7.6  | 18.3 | 21.8  |
| 01        | 472.5 | 8.5  | 47.4 | 24.1 | 68.2 | 27.6 | 96.5 | 63.2 | 288.2 | 29.5 | 63.5 | 137.7 |
| 02        | 468.4 | 12.6 | 44.1 | 28.4 | 55.8 | 26.1 | 55.7 | 73.2 | 297.4 | 36.8 | 63.6 | 92.7  |
| 03        | 495.3 | 11.1 | 31.3 | 32.9 | 67.0 | 29.3 | 74.7 | 82.1 | 402.3 | 37.2 | 53.0 | 116.2 |
| 04        | 467.4 | 15.3 | 9.4  | 24.9 | 59.2 | 18.2 | 14.0 | 78.7 | 549.2 | 37.2 | 74.9 | 116.2 |
| 05        | 448.5 | 11.9 | 48.1 | 29.9 | 66.2 | 23.0 | 66.0 | 79.0 | 262.4 | 29.8 | 55.5 | 117.2 |
| 06        | 463.5 | 15.1 | 45.9 | 30.5 | 59.0 | 24.2 | 66.4 | 80.8 | 261.5 | 33.5 | 66.3 | 88.9  |
| Minimum   | 448.5 | 8.5  | 9.4  | 24.1 | 55.8 | 18.2 | 14.0 | 63.2 | 261.5 | 29.5 | 53.0 | 88.9  |
| Average   | 469.3 | 12.4 | 37.7 | 28.5 | 62.6 | 24.7 | 62.2 | 76.2 | 343.5 | 34.0 | 62.8 | 111.5 |
| Maximum   | 495.3 | 15.3 | 48.1 | 32.9 | 68.2 | 29.3 | 96.5 | 82.1 | 549.2 | 37.2 | 74.9 | 137.7 |

| Stream ID | Q13   | Q14  | Q15  | Q16  | Q17  | Q18   | Q19  | Q20  | Q21   | Q22  | RF1  | RF2  |
|-----------|-------|------|------|------|------|-------|------|------|-------|------|------|------|
| 00        | 30.2  | 3.4  | 3.9  | 17.9 | 6.6  | 116.4 | 23.5 | 13.6 | 92.3  | 15.2 | 31.9 | 26.1 |
| 01        | 115.2 | 11.0 | 18.0 | 68.5 | 31.1 | 392.1 | 41.6 | 74.2 | 534.8 | 67.3 | 51.3 | 24.9 |
| 02        | 94.1  | 11.2 | 21.8 | 72.1 | 30.9 | 648.3 | 44.1 | 72.2 | 411.7 | 70.8 | 35.6 | 24.7 |
| 03        | 112.5 | 13.9 | 19.4 | 72.7 | 23.4 | 340.0 | 48.9 | 81.7 | 475.6 | 82.8 | 31.6 | 23.9 |
| 04        | 74.8  | 12.2 | 18.3 | 68.0 | 21.1 | 503.9 | 56.1 | 13.2 | 531.5 | 14.4 | 32.5 | 23.7 |
| 05        | 130.6 | 12.0 | 22.0 | 61.2 | 25.3 | 340.6 | 51.5 | 80.5 | 537.0 | 84.4 | 31.5 | 23.8 |
| 06        | 120.0 | 13.9 | 19.0 | 75.8 | 14.4 | 524.3 | 51.4 | 77.9 | 463.3 | 69.7 | 29.5 | 23.3 |
| Minimum   | 74.8  | 11.0 | 18.0 | 61.2 | 14.4 | 340.0 | 41.6 | 13.2 | 411.7 | 14.4 | 29.5 | 23.3 |
| Average   | 107.9 | 12.4 | 19.8 | 69.7 | 24.4 | 458.2 | 48.9 | 66.6 | 492.3 | 64.9 | 35.3 | 24.1 |
| Maximum   | 130.6 | 13.9 | 22.0 | 75.8 | 31.1 | 648.3 | 56.1 | 81.7 | 537.0 | 84.4 | 51.3 | 24.9 |