



# HP ProLiant DL380 Gen9

TPC-H Rev. 2.17.0  
 TPC Pricing Rev. 1.7.0  
 Report Date:  
 September 8, 2014

Total System Cost

Composite Query per Hour Rating

Price/Performance

**\$375,529 USD**

**390,590.9**  
 QphH @ 1000GB

**\$0.97 USD**  
 \$ / QphH @1000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

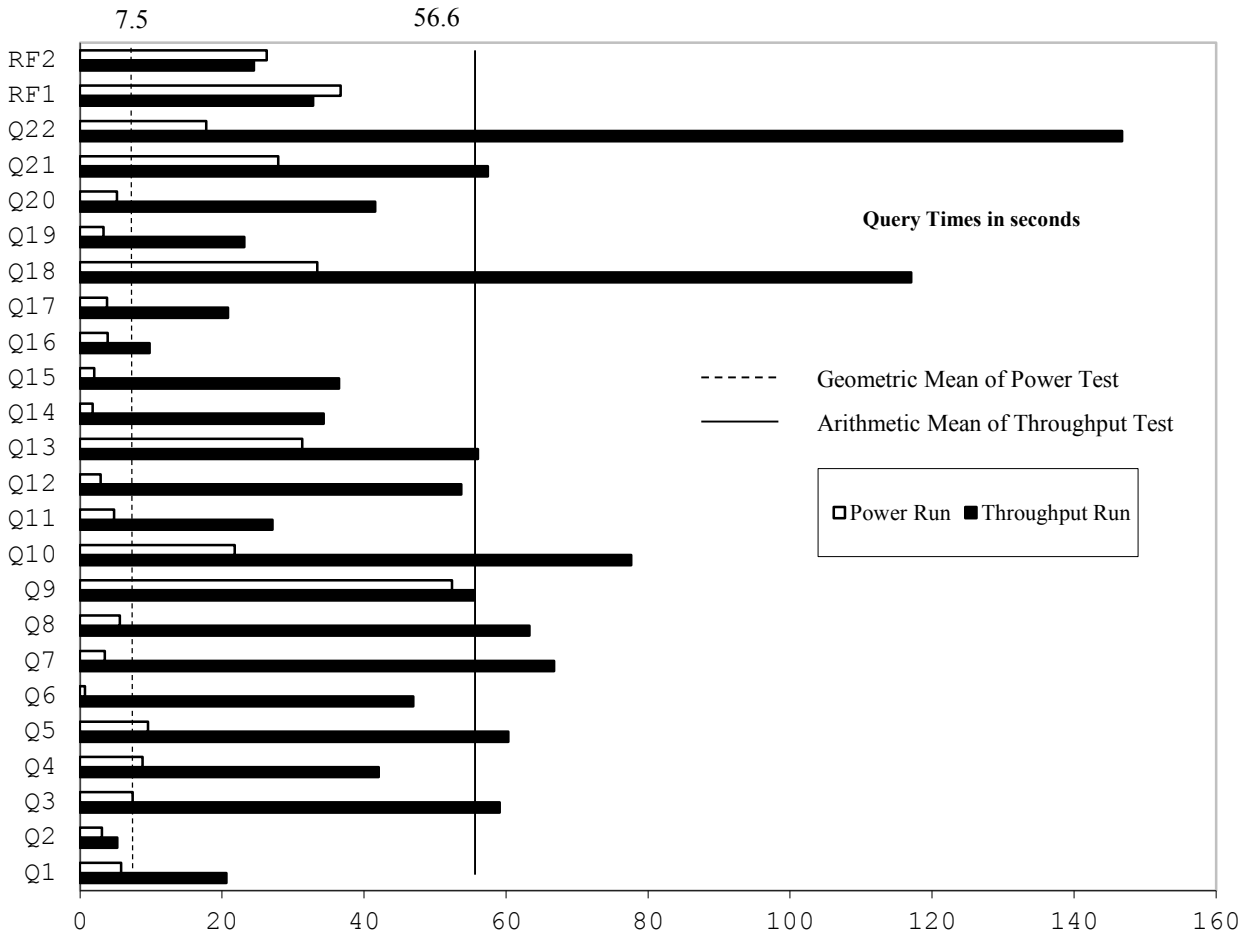
**1000GB**

**SQL Server 2014  
 Enterprise Edition**

**Windows Server 2012  
 R2 Standard Edition**

**None**

**Now**



Database Load Time = 00d 15h 33m 53s

Storage Redundancy Level

Load included backup: Y

Base Tables and Auxiliary Data Structures

0

Total Data Storage / Database Size = 10.8

DBMS Temporary Space

0

Memory/Database Size = 76.8%

OS and DBMS Software

1

**System Components**

**System Total**

**Per Node**

|  |       |       |
|--|-------|-------|
| Nodes:   | 1     | n.a.  |
| Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz:         | 2     | 2     |
| Cores/Threads:                                     | 36/72 | 36/72 |
| Memory:  | 768GB | 768GB |
| OS Disk Drives (400GB 12G SAS SSD):                | 2     | 2     |
| Network Interfaces (on-board GigE):                | 1     | 1     |
| Storage Controllers (P840 HBA):                    | 1     | 1     |
| (P441 HBA):  | 2     | 2     |
| Storage Shelves D3700:                             | 3     | 3     |
| Storage Subsystem Disk Drives (400GB 12G SAS SSD): | 25    | n.a.  |



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| Description  | Price Key | Part Number | Unit Price                  | Qty | Extended Price                       | 3 Yr Maint Price |                |
|--|-----------|-------------|-----------------------------|-----|--------------------------------------|------------------|----------------|
| <b>Server Hardware</b>   |           |             |                             |     |                                      |                  |                |
| HP ProLiant DL380 G9 8SFF CTO Server (Customer to Order)   | 1         | 719064-B21  | \$1,867                     | 1   | \$1,867                              |                  |                |
| HP DL380 Gen9 Intel® Xeon® E5-2699 v3 (2.30GHz/18-core) Kit  | 1         | 781915-B21  | \$6,399                     | 1   | \$6,399                              |                  |                |
| HP DL380 Gen9 Intel® Xeon® E5-2699 v3 (2.30GHz/18-core) FIO Kit  | 1         | 781915-L21  | \$6,399                     | 1   | \$6,399                              |                  |                |
| HP 32GB Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced   | 1         | 726722-B21  | \$999                       | 24  | \$23,976                             |                  |                |
| HP DL380 Gen9 Secondary 3 Slot GPU Ready Riser Kit   | 1         | 719073-B21  | \$99                        | 1   | \$99                                 |                  |                |
| HP DL380 Gen9 8SFF Bay1 Cage/Backplane Kit   | 1         | 719067-B21  | \$350                       | 1   | \$350                                |                  |                |
| HP DL380 Gen9 Additional 8SFF Bay2 Cage/Backplane Kit  | 1         | 768857-B21  | \$700                       | 1   | \$700                                |                  |                |
| HP 12Gb SAS Expander Card with Cables for DL380 Gen9   | 1         | 727250-B21  | \$659                       | 1   | \$659                                |                  |                |
| HP DL380 Gen9 High Performance Temperature Fan Kit   | 1         | 719079-B21  | \$239                       | 1   | \$239                                |                  |                |
| HP 1400W Flex Slot Platinum Plus Hot Plug Power Supply   | 1         | 720620-B21  | \$429                       | 2   | \$858                                |                  |                |
| HP 3y 4h 24x7 ProLiant D380 Gen9 FC SVC HW Support   | 1         | U7AE5E      | \$1,821                     | 1   |                                      | \$1,821          |                |
| HP 17" FlatPanel Monitor   | 1         | GV537A8     | \$130                       | 3   | \$390                                |                  |                |
| HP PS/2 Keyboard And Mouse Bundle  | 1         | RC464AA     | \$39                        | 3   | \$117                                |                  |                |
|  |           |             | <b>Subtotal</b>             |     | <b>\$42,053</b>                      | <b>\$1,821</b>   |                |
| <b>Storage</b>   |           |             |                             |     |                                      |                  |                |
| HP Universal Rack 11642 1075mm Shock Rack  | 1         | H6J66A      | \$1,699                     | 1   | \$1,699                              |                  |                |
| HP 24A High Voltage Core Only Corded PDU   | 1         | 252663-D74  | \$259                       | 2   | \$518                                |                  |                |
| HP StorageWorks D3700 Disk Enclosure   | 1         | QW967A      | \$3,738                     | 3   | \$11,214                             |                  |                |
| HP StorageWorks D3700 Disk Enclosure (10% Spares)  | 1         | QW967A      | \$3,738                     | 2   | \$7,476                              |                  |                |
| HP 400GB 12G SAS ME 2.5in SC EM SSD  | 1         | 741142-B21  | \$3,599                     | 27  | \$97,173                             |                  |                |
| HP 400GB 12G SAS ME 2.5in SC EM SSD (10% Spares)   | 1         | 741142-B21  | \$3,599                     | 3   | \$10,797                             |                  |                |
| HP DL380 Gen9 P841/440 SAS Cable Kit   | 1         | 783007-B21  | \$59                        | 3   | \$177                                |                  |                |
| HP Smart Array P441/4GB FBWC 8-Port Ext SAS  | 1         | 726825-B21  | \$989                       | 2   | \$1,978                              |                  |                |
| HP Smart Array P441/4GB FBWC 8-Port Ext SAS (10% spares)   | 1         | 726825-B21  | \$989                       | 2   | \$1,978                              |                  |                |
| HP Smart Array P840/4GB  | 1         | 726897-B21  | \$1,374                     | 1   | \$1,374                              |                  |                |
| HP Smart Array P840/4GB (10% spares)   | 1         | 726897-B21  | \$1,374                     | 2   | \$2,748                              |                  |                |
|  |           |             | <b>Subtotal</b>             |     | <b>\$137,132</b>                     | <b>\$0</b>       |                |
| <b>Server Software</b>   |           |             |                             |     |                                      |                  |                |
| SQL Server 2014 Enterprise Edition (2 core license, 36 cores)  | 2         | 7JQ-00750   | \$13,472.50                 | 18  | \$242,505                            |                  |                |
| Windows Server 2012 R2 Standard Edition (2 processor license)  | 2         | P73-06284   | \$735                       | 1   | \$735                                |                  |                |
| Windows Server 2012 R2 Client Access License   | 2         | R18-04280   | \$24.36                     | 70  | \$1,706                              |                  |                |
| Microsoft Problem Resolution Services  | 2         | N/A         | \$259                       | 1   |                                      | \$259            |                |
|  |           |             | <b>Subtotal</b>             |     | <b>\$244,946</b>                     | <b>\$259</b>     |                |
|  |           |             | <b>Total Extended Price</b> |     | <b>\$424,131</b>                     | <b>\$2,080</b>   |                |
|  |           |             | <b>Total Discounts</b>      |     | <b>\$50,171</b>                      | <b>\$509</b>     |                |
| Price Key: 1 - HP , 2 - Microsoft<br><b>Audited by Francois Raab of InfoSizing, Inc. (www.sizing.com)</b>  |           |             |                             |     | <b>Grand Total</b>                   | <b>\$373,960</b> | <b>\$1,571</b> |
| All discounts are based on US list prices and for similar quantities and configurations. A 28% discount was based on the overall specific components pricing from vendor 1 in this single quotation. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the configuration.   |           |             |                             |     | <b>3 year cost of ownership USD:</b> | <b>\$375,531</b> |                |
|  |           |             |                             |     | <b>QpH @ 1000GB:</b>                 | <b>390,590.9</b> |                |
|  |           |             |                             |     | <b>\$ USD/QpH @ 1000GB</b>           | <b>\$0.97</b>    |                |
| Sales contact: HP WW Headquarters, 3000 Hanover St., Palo Alto, CA 94304-1185 (650) 857-1501 or H-P direct: 800-203-6748<br>Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399 (425) 882 8080  |           |             |                             |     |                                      |                  |                |
| 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 terms, please inform at <a href="mailto:pricing@tpc.org">pricing@tpc.org</a> . Thank you. |           |             |                             |     |                                      |                  |                |



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## Numerical Quantities

### Measurement Results

|   |                     |
|---|---------------------|
| Database Scale Factor                                 | 1,000               |
| Total Data Storage / Database Size                    | 10.8                |
| Percentage Memory / Database Size                     | 76.8                |
| Start of Database Load                                | 2014-09-01 17:36:29 |
| End of Database Load                                  | 2014-09-02 09:10:22 |
| Database Load Time                                    | 00d 15h 33m 53s     |
| Query Streams for Throughput Test                     | 7                   |
| TPC-H Power   | 477,717.1           |
| TPC-H Throughput                                      | 319,354.8           |
| TPC-H Composite Query-per-Hour (QphH@1000GB)          | 390,590.9           |
| Total System Price over 3 Years (\$ USD)              | \$375,529           |
| TPC-H Price/Performance Metric (\$ USD / QphH@1000GB) | \$0.97              |

### Measurement Interval

Measurement Interval in Throughput Test 1,736 seconds

### Duration of Stream Execution

| Power Run         | Seed      | Query Start Time    | Duration<br>(sec) | RF1 Start Time      | RF2 Start Time      |
|-------------------|-----------|---------------------|-------------------|---------------------|---------------------|
|                   |           | Query End Time      |                   | RF1 End Time        | RF2 End Time        |
|                   | 902091022 | 2014-09-02 09:28:19 | 00 00:04:17       | 2014-09-02 09:27:42 | 2014-09-02 09:32:36 |
|                   |           | 2014-09-02 09:32:36 | 257               | 2014-09-02 09:28:19 | 2014-09-02 09:33:03 |
| Throughput Stream | Seed      | Query Start Time    | Duration<br>(sec) | RF1 Start Time      | RF2 Start Time      |
| 1                 | 902091023 | 2014-09-02 09:33:02 | 00 00:22:18       | 2014-09-02 09:55:19 | 2014-09-02 09:55:51 |
|                   |           | 2014-09-02 09:55:20 | 1,338             | 2014-09-02 09:55:51 | 2014-09-02 09:56:15 |
| 2                 | 902091024 | 2014-09-02 09:33:02 | 00 00:20:58       | 2014-09-02 09:56:15 | 2014-09-02 09:56:48 |
|                   |           | 2014-09-02 09:54:00 | 1,258             | 2014-09-02 09:56:48 | 2014-09-02 09:57:13 |
| 3                 | 902091025 | 2014-09-02 09:33:02 | 00 00:19:33       | 2014-09-02 09:57:13 | 2014-09-02 09:57:44 |
|                   |           | 2014-09-02 09:52:35 | 1,173             | 2014-09-02 09:57:44 | 2014-09-02 09:58:08 |
| 4                 | 902091026 | 2014-09-02 09:33:02 | 00 00:21:01       | 2014-09-02 09:58:08 | 2014-09-02 09:58:42 |
|                   |           | 2014-09-02 09:54:03 | 1,261             | 2014-09-02 09:58:42 | 2014-09-02 09:59:06 |
| 5                 | 902091027 | 2014-09-02 09:33:02 | 00 00:20:25       | 2014-09-02 09:59:07 | 2014-09-02 09:59:40 |
|                   |           | 2014-09-02 09:53:27 | 1,225             | 2014-09-02 09:59:40 | 2014-09-02 10:00:05 |
| 6                 | 902091028 | 2014-09-02 09:33:02 | 00 00:22:10       | 2014-09-02 10:00:05 | 2014-09-02 10:00:36 |
|                   |           | 2014-09-02 09:55:12 | 1,330             | 2014-09-02 10:00:36 | 2014-09-02 10:01:00 |
| 7                 | 902091029 | 2014-09-02 09:33:02 | 00 00:18:59       | 2014-09-02 10:01:00 | 2014-09-02 10:01:33 |
|                   |           | 2014-09-02 09:52:01 | 1,139             | 2014-09-02 10:01:33 | 2014-09-02 10:01:58 |



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### TPC-H Timing Intervals (in seconds):

| Query | Stream 0 | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 | Stream 6 | Stream 7 | Min Qi | Max Qi | Avg. Qi |
|-------|----------|----------|----------|----------|----------|----------|----------|----------|--------|--------|---------|
| Q1    | 5.8      | 16.5     | 20.6     | 22.9     | 47.0     | 40.2     | 5.8      | 6.0      | 5.8    | 47.0   | 23.5    |
| Q2    | 3.1      | 7.2      | 5.7      | 7.2      | 5.9      | 8.3      | 0.9      | 3.6      | 0.9    | 8.3    | 6.0     |
| Q3    | 7.4      | 86.3     | 41.6     | 39.1     | 75.0     | 97.4     | 86.3     | 39.6     | 7.4    | 97.4   | 67.5    |
| Q4    | 8.8      | 17.3     | 59.5     | 58.7     | 31.9     | 62.7     | 57.2     | 40.5     | 8.8    | 62.7   | 48.1    |
| Q5    | 9.6      | 79.9     | 86.6     | 69.9     | 93.9     | 51.0     | 9.9      | 81.8     | 9.6    | 93.9   | 68.9    |
| Q6    | 0.7      | 49.5     | 57.2     | 55.3     | 57.5     | 55.6     | 47.3     | 52.5     | 0.7    | 57.5   | 53.7    |
| Q7    | 3.5      | 83.7     | 63.9     | 66.8     | 89.4     | 64.8     | 51.9     | 110.3    | 3.5    | 110.3  | 76.3    |
| Q8    | 5.6      | 83.1     | 60.3     | 89.7     | 35.3     | 90.1     | 117.0    | 25.2     | 5.6    | 117.0  | 72.3    |
| Q9    | 52.4     | 34.3     | 44.1     | 95.0     | 64.1     | 47.2     | 49.6     | 57.2     | 34.3   | 95.0   | 63.4    |
| Q10   | 21.8     | 81.3     | 62.2     | 132.7    | 75.1     | 46.6     | 100.5    | 100.8    | 21.8   | 132.7  | 88.7    |
| Q11   | 4.8      | 37.0     | 41.0     | 24.3     | 37.1     | 39.1     | 9.2      | 24.4     | 4.8    | 41.0   | 31.0    |
| Q12   | 2.9      | 91.0     | 96.4     | 46.1     | 109.2    | 64.2     | 5.0      | 14.8     | 2.9    | 109.2  | 61.4    |
| Q13   | 31.3     | 100.4    | 87.2     | 36.5     | 49.9     | 52.5     | 36.9     | 53.5     | 31.3   | 100.4  | 64.0    |
| Q14   | 1.8      | 34.8     | 59.3     | 21.9     | 48.0     | 47.3     | 2.1      | 59.4     | 1.8    | 59.4   | 39.2    |
| Q15   | 2.0      | 59.2     | 48.1     | 44.8     | 38.0     | 36.1     | 40.9     | 22.6     | 2.0    | 59.2   | 41.7    |
| Q16   | 3.9      | 13.3     | 15.8     | 8.6      | 7.8      | 12.0     | 4.0      | 12.9     | 3.9    | 15.8   | 11.2    |
| Q17   | 3.8      | 10.3     | 78.9     | 20.5     | 14.3     | 7.1      | 4.1      | 27.8     | 3.8    | 78.9   | 23.8    |
| Q18   | 33.4     | 129.3    | 135.4    | 112.7    | 169.3    | 113.7    | 106.0    | 136.8    | 33.4   | 169.3  | 133.8   |
| Q19   | 3.3      | 16.6     | 51.9     | 3.9      | 61.1     | 31.8     | 3.5      | 12.9     | 3.3    | 61.1   | 26.4    |
| Q20   | 5.2      | 45.9     | 46.6     | 74.1     | 25.6     | 55.9     | 5.3      | 74.2     | 5.2    | 74.2   | 47.5    |
| Q21   | 27.9     | 80.3     | 41.5     | 49.2     | 54.6     | 121.3    | 30.2     | 54.7     | 27.9   | 121.3  | 65.7    |
| Q22   | 17.8     | 180.0    | 53.8     | 92.1     | 70.0     | 78.7     | 555.1    | 126.7    | 17.8   | 555.1  | 167.7   |
| RF1   | 36.7     | 31.0     | 33.0     | 30.9     | 33.5     | 33.1     | 30.9     | 33.5     | 30.9   | 36.7   | 37.5    |
| RF2   | 26.3     | 23.7     | 24.3     | 24.1     | 24.4     | 25.3     | 23.3     | 24.7     | 23.3   | 26.3   | 28.0    |