



# HP ProLiant DL585 2.2GHz 4P DC

TPC-H Rev. 2.3.0

Report Date:  
**August 31, 2005**

Total System Cost

Composite Query per Hour Metric

Price / Performance

**\$288,751**

**11915.3**

**\$24.24 USD**

QpH @ 300GB

per QpH @ 300GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

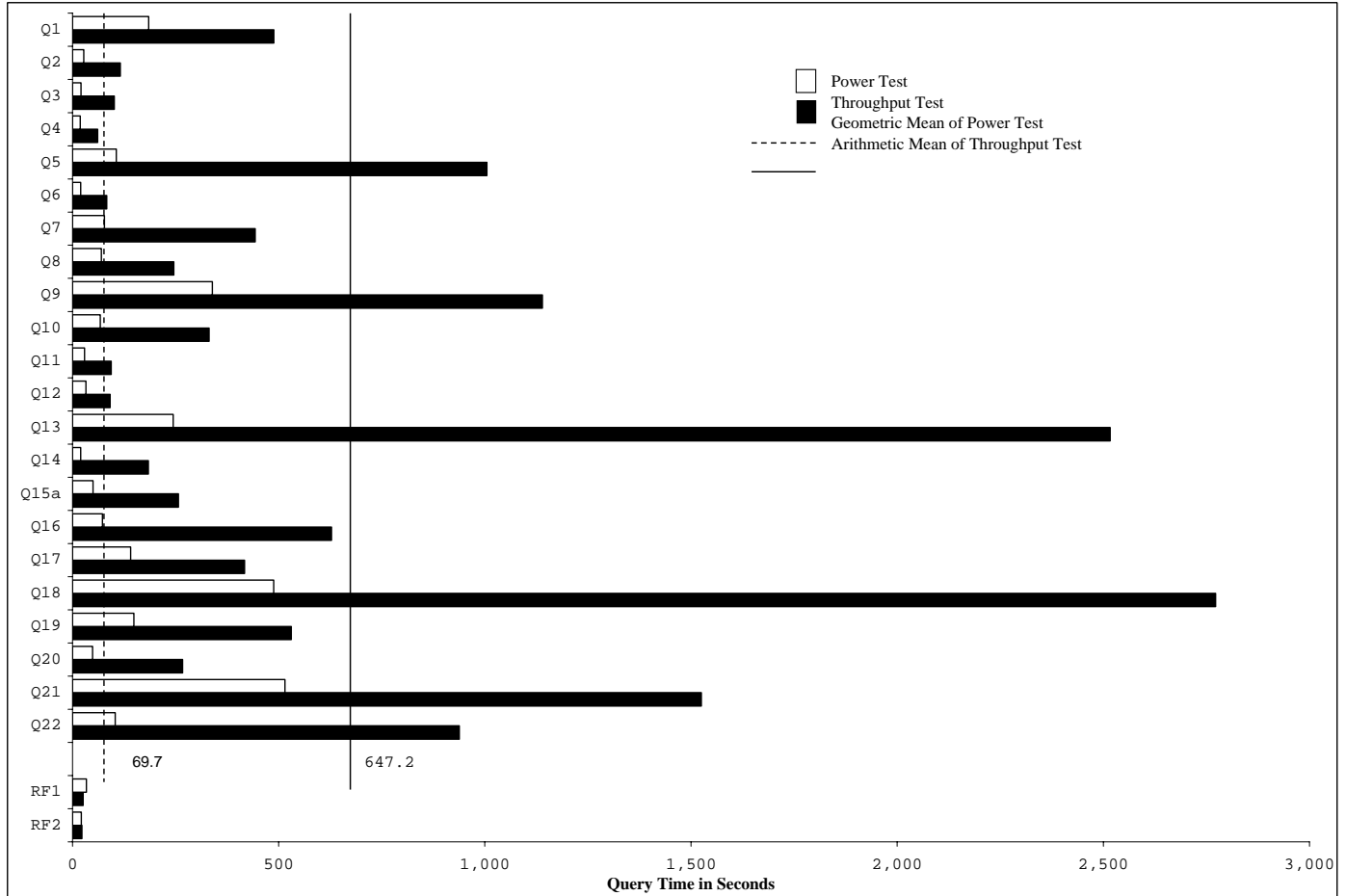
**300GB**

**IBM  
DB2 UDB 8.2**

**Red Hat Enterprise  
Linux 4 AS**

**none**

**Oct 5, 2005**



Database Load Time = 6:16:45

Load Included Backup: Y

Total Data Storage / Database Size = 19.7

RAID (Base tables only): N

RAID (Base tables and auxiliary data structures): N

RAID (All): N

**System Configuration :**

**Processors :** 4 x 2.2GHz 1MB L2 cache dual core AMD Opteron 875 Processors  
**Cores :** 8 total  
**Threads :** 8 total  
**Memory :** 64 GB memory  
**Disk Controllers :** 8 x HP Smart Array P600 SAS Controller  
**Disks :** 160 x 36.4GB SAS 10K SFF drives (external)  
 2 x 36.4GB 15K U320 drives (internal)  
**Total Disk Storage:** 5896.8 GB

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



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| Description   | Part Number | Third Party | Unit Price | Qty | Extended Price   | 3 yr. Maint. Price |
|---|-------------|-------------|------------|-----|------------------|--------------------|
| <b>Server Hardware</b>  |             |             |            |     |                  |                    |
| <b>Brand Pricing</b>  |             |             |            |     |                  |                    |
| ProLiant DL585 R01 O2.2GHz (1 MB) x 2<br>- 2 GB PC2700 DDR, Integrated Smart Array Controller 5i,<br>- Embedded NC7782 Dual Port PCI-X 10/100/1000T Gigabit NIC | 383357-001  | 1           | 15,999     | 1   | 15,999           |                    |
| DL585 875 O2.2GHz/PC2700 8 socket processor option kit  | 381476-B21  | 1           | 4,049      | 2   | 8,098            |                    |
| 4 GB PC2700 DDR SDRAM DIMM 2x2048 WW  | 371049-B21  | 1           | 2,269      | 16  | 36,304           |                    |
| HP s7540 17in CRT Monitor   | PF997AA#ABA | 1           | 149        | 1   | 149              |                    |
| HP PS/2 Scroll Mouse Carbonite  | DG169AV     | 1           | 5          | 1   | 5                |                    |
| PS/2 Standard Keyboard  | DG170AV#ABA | 1           | 10         | 1   | 10               |                    |
| HP 5642 Unassembled Rack  | 358254-B21  | 1           | 689        | 1   | 689              |                    |
| 3YR 24X7 4HR 500 SERIES SVR   | U4608E      | 1           | 1,575      | 1   |                  | 1,575              |
| <b>Subtotal</b>   |             |             |            |     | <b>61,254</b>    | <b>1,575</b>       |
| <b>Storage</b>  |             |             |            |     |                  |                    |
| HP SMART Array P600 3G SAS/SATA RAID Controller   | 337972-B21  | 1           | 999        | 8   | 7,992            |                    |
| HP StorageWorks MSA50 Disk Enclosure  | 364430-B21  | 1           | 1,899      | 16  | 30,384           |                    |
| HP 36GB 15K U320 Pluggable Hard Drive (internal)  | 286776-B22  | 1           | 299        | 2   | 598              |                    |
| HP 36GB 10K SAS Single Port SFF Hard Drive  | 375859-B21  | 1           | 329        | 160 | 52,640           |                    |
| MSA50 Carepaq 3yr 4hr 24x7  | U8130E      | 1           | 1,827      | 16  |                  | 29,232             |
| <b>Subtotal</b>   |             |             |            |     | <b>91,614</b>    | <b>29,232</b>      |
| <b>Hardware and Maintenance Discount</b>  |             |             |            |     |                  |                    |
| Large Purchase and Net 30 discount  | 16.0%       | 1           |            |     | (\$24,459)       | (\$4,929)          |
| <b>Hardware Subtotal</b>  |             |             |            |     | <b>128,409</b>   | <b>25,878</b>      |
| <b>Software</b>   |             |             |            |     |                  |                    |
| DB2 UDB Enterprise Server Edition (ESE) License incl 1-yr Maint   | IBM         | 2           | 22,608     | 4   | 90,432           |                    |
| DB2 UDB Enterprise Server Edition (ESE) Support - 1-yr/proc   | IBM         | 2           | 1,077      | 8   |                  | 8,616              |
| DB2 UDB Data Partitioning Feature (DPF) License incl 1-yr Maint   | IBM         | 2           | 6,791      | 4   | 27,164           |                    |
| DB2 UDB Data Partitioning Feature (DPF) Support - 1-yr/proc   | IBM         | 2           | 323        | 8   |                  | 2,584              |
| HP Red Hat Ent Linux 4 AS w/PRM 24x7 3yr sw tech sprt unlim.  | 392381-B26  | 1           | 6,747      | 1   | 6,747            | included           |
| <b>Subtotal</b>   |             |             |            |     | <b>124,343</b>   | <b>11,200</b>      |
| <b>HP Software and Maintenance Discount</b>   |             |             |            |     |                  |                    |
| Large Purchase and Net 30 discount  | 16.0%       | 1           |            |     | (\$1,080)        |                    |
| <b>Software Subtotal</b>  |             |             |            |     | <b>123,263</b>   | <b>11,200</b>      |
| <b>Total</b>  |             |             |            |     | <b>\$251,673</b> | <b>\$37,078</b>    |
| <b>Three-Year Cost of Ownership:</b>  |             |             |            |     |                  | <b>\$288,751</b>   |
| <b>QpH @ 300GB:</b>   |             |             |            |     |                  | <b>11915.3</b>     |
| <b>\$/ QpH @ 300GB:</b>   |             |             |            |     |                  | <b>\$24.24 USD</b> |

Pricing: 1=HP Direct: 800-203-6748; 2=IBM

Note: The benchmark results and test methodology were audited by Lorna Livingtree of Performance Metrics, Inc. (www.perfmtrics.com).

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 pricing@tpc.org. Thank you.



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## Numerical Quantities

### Measurement Results:

|  |                      |
|--|----------------------|
| Database Scale Factor                              | = 300                |
| Total Data Storage / Database Size                 | = 19.7               |
| Start of Database Load                             | = 8/22/2005 14:46:18 |
| End of Database Load                               | = 8/22/2005 21:03:03 |
| Database Load Time                                 | = 6:16:45            |
| Query Streams for Throughput Test                  | = 6                  |
| TPC-H Power  | = 15504.0            |
| TPC-H Throughput                                   | = 9157.2             |
| TPC-H Composite Query-per-Hour Metric (QphH@300GB) | = 11915.3            |
| Total System Price Over 5 Years                    | = \$288,751 USD      |
| TPC-H Price/ Performance Metric (\$/QphH@300GB)    | = \$24.24 USD        |

### Measurement Intervals:

|  |                 |
|--|-----------------|
| Measurement Interval in Throughput Test (Ts) | = 15568 seconds |
|--|-----------------|

### Duration of Stream Execution:

|                  | Seed      | Query Start Date/Time |                     | RF1 Start Date/Time |                   | RF2 Start Date/Time |                   | Duration |
|------------------|-----------|-----------------------|---------------------|---------------------|-------------------|---------------------|-------------------|----------|
|                  |           | Query End Date/Time   | Query End Date/Time | RF1 End Date/Time   | RF1 End Date/Time | RF2 End Date/Time   | RF2 End Date/Time |          |
| <b>Stream 00</b> | 822210303 | 08/22/05              | 23:01:06            | 08/22/05            | 23:00:33          | 08/22/05            | 23:48:14          | 0:47:07  |
|                  |           | 08/22/05              | 23:48:14            | 08/22/05            | 23:01:06          | 08/22/05            | 23:48:35          |          |
| <b>Stream 01</b> | 822210304 | 08/22/05              | 23:48:38            | 08/23/05            | 3:58:37           | 08/23/05            | 4:03:43           | 4:09:59  |
|                  |           | 08/23/05              | 3:58:37             | 08/23/05            | 4:03:43           | 08/23/05            | 4:04:07           |          |
| <b>Stream 02</b> | 822210305 | 08/22/05              | 23:48:38            | 08/23/05            | 3:52:54           | 08/23/05            | 4:04:32           | 4:04:17  |
|                  |           | 08/23/05              | 3:52:54             | 08/23/05            | 4:04:32           | 08/23/05            | 4:04:53           |          |
| <b>Stream 03</b> | 822210306 | 08/22/05              | 23:48:38            | 08/23/05            | 3:34:32           | 08/23/05            | 4:05:18           | 3:45:55  |
|                  |           | 08/23/05              | 3:34:32             | 08/23/05            | 4:05:18           | 08/23/05            | 4:05:44           |          |
| <b>Stream 04</b> | 822210307 | 08/22/05              | 23:48:38            | 08/23/05            | 3:31:47           | 08/23/05            | 4:06:10           | 3:43:09  |
|                  |           | 08/23/05              | 3:31:47             | 08/23/05            | 4:06:10           | 08/23/05            | 4:06:34           |          |
| <b>Stream 05</b> | 822210308 | 08/22/05              | 23:48:38            | 08/23/05            | 4:03:13           | 08/23/05            | 4:06:59           | 4:14:35  |
|                  |           | 08/23/05              | 4:03:13             | 08/23/05            | 4:06:59           | 08/23/05            | 4:07:20           |          |
| <b>Stream 06</b> | 822210309 | 08/22/05              | 23:48:38            | 08/23/05            | 3:34:28           | 08/23/05            | 4:07:46           | 3:45:50  |
|                  |           | 08/23/05              | 3:34:28             | 08/23/05            | 4:07:46           | 08/23/05            | 4:08:06           |          |



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TPC-H Timing Intervals (in seconds)

| Query     | Q1     | Q2     | Q3    | Q4    | Q5     | Q6     | Q7    | Q8    |
|-----------|--------|--------|-------|-------|--------|--------|-------|-------|
| Stream 00 | 185.0  | 27.4   | 20.6  | 18.8  | 106.4  | 19.9   | 77.7  | 70.2  |
| Stream 01 | 245.0  | 119.1  | 100.1 | 23.4  | 700.0  | 46.4   | 562.3 | 309.5 |
| Stream 02 | 639.2  | 171.0  | 31.5  | 65.9  | 1322.6 | 130.9  | 464.6 | 164.4 |
| Stream 03 | 446.0  | 62.2   | 70.9  | 59.4  | 1243.0 | 90.0   | 550.3 | 262.8 |
| Stream 04 | 533.8  | 106.9  | 153.2 | 56.9  | 1178.3 | 64.0   | 348.6 | 248.1 |
| Stream 05 | 599.6  | 121.8  | 85.0  | 67.5  | 770.4  | 95.5   | 458.7 | 261.5 |
| Stream 06 | 468.0  | 114.7  | 167.7 | 93.9  | 815.9  | 72.5   | 273.9 | 227.3 |
| minimum   | 245.0  | 62.2   | 31.5  | 23.4  | 700.0  | 46.4   | 273.9 | 164.4 |
| average   | 488.6  | 116.0  | 101.4 | 61.2  | 1005.0 | 83.2   | 443.1 | 245.6 |
| maximum   | 639.2  | 171.0  | 167.7 | 93.9  | 1322.6 | 130.9  | 562.3 | 309.5 |
| Query     | Q9     | Q10    | Q11   | Q12   | Q13    | Q14    | Q15a  | Q16   |
| Stream 00 | 339.2  | 67.3   | 29.2  | 32.8  | 244.2  | 19.9   | 50.0  | 72.8  |
| Stream 01 | 655.9  | 559.1  | 84.9  | 97.1  | 2818.7 | 228.0  | 331.1 | 683.2 |
| Stream 02 | 1859.4 | 411.7  | 43.6  | 96.3  | 2163.7 | 157.7  | 169.5 | 694.5 |
| Stream 03 | 1353.9 | 194.4  | 90.2  | 119.2 | 1624.5 | 204.7  | 220.0 | 270.1 |
| Stream 04 | 1258.7 | 309.0  | 86.7  | 96.8  | 2632.5 | 215.7  | 334.7 | 314.6 |
| Stream 05 | 328.3  | 177.5  | 69.3  | 54.6  | 3484.6 | 192.4  | 301.1 | 910.2 |
| Stream 06 | 1382.3 | 337.3  | 189.0 | 83.5  | 2376.4 | 105.7  | 186.7 | 896.3 |
| minimum   | 328.3  | 177.5  | 43.6  | 54.6  | 1624.5 | 105.7  | 169.5 | 270.1 |
| average   | 1139.8 | 331.5  | 94.0  | 91.3  | 2516.7 | 184.0  | 257.2 | 628.2 |
| maximum   | 1859.4 | 559.1  | 189.0 | 119.2 | 3484.6 | 228.0  | 334.7 | 910.2 |
| Query     | Q17    | Q18    | Q19   | Q20   | Q21    | Q22    | RF1   | RF2   |
| Stream 00 | 141.2  | 488.2  | 149.1 | 48.7  | 515.4  | 103.8  | 33.6  | 21.6  |
| Stream 01 | 423.2  | 4162.5 | 691.8 | 107.8 | 1568.5 | 480.6  | 29.5  | 24.6  |
| Stream 02 | 504.1  | 2923.8 | 682.2 | 172.0 | 1025.0 | 763.1  | 25.1  | 20.8  |
| Stream 03 | 562.6  | 3270.9 | 341.4 | 81.9  | 1335.1 | 1101.2 | 24.5  | 26.0  |
| Stream 04 | 530.5  | 1480.0 | 504.7 | 187.5 | 1649.0 | 1098.8 | 25.6  | 24.0  |
| Stream 05 | 239.0  | 2896.1 | 491.1 | 921.3 | 1565.2 | 1183.1 | 25.0  | 21.7  |
| Stream 06 | 244.8  | 1900.6 | 471.9 | 130.7 | 2008.8 | 1001.5 | 25.4  | 20.4  |
| minimum   | 239.0  | 1480.0 | 341.4 | 81.9  | 1025.0 | 480.6  | 24.5  | 20.4  |
| average   | 417.4  | 2772.3 | 530.5 | 266.9 | 1525.3 | 938.1  | 25.9  | 22.9  |
| maximum   | 562.6  | 4162.5 | 691.8 | 921.3 | 2008.8 | 1183.1 | 29.5  | 26.0  |