



HP BladeSystem ProLiant BL25p Cluster 8P DC

TPC-H Rev. 2.3.0

Report Date:
November 11, 2005

Total System Cost

\$523,764 USD

Composite Query per Hour Metric

18725.9
QphH@300GB

Price / Performance

\$27.97 USD
\$ / QphH@300GB

Database Size

300GB

Database Manager

**Oracle Database 10g
Release 2, Enterprise
Edition with Oracle Real
Application Clusters and
Partitioning**

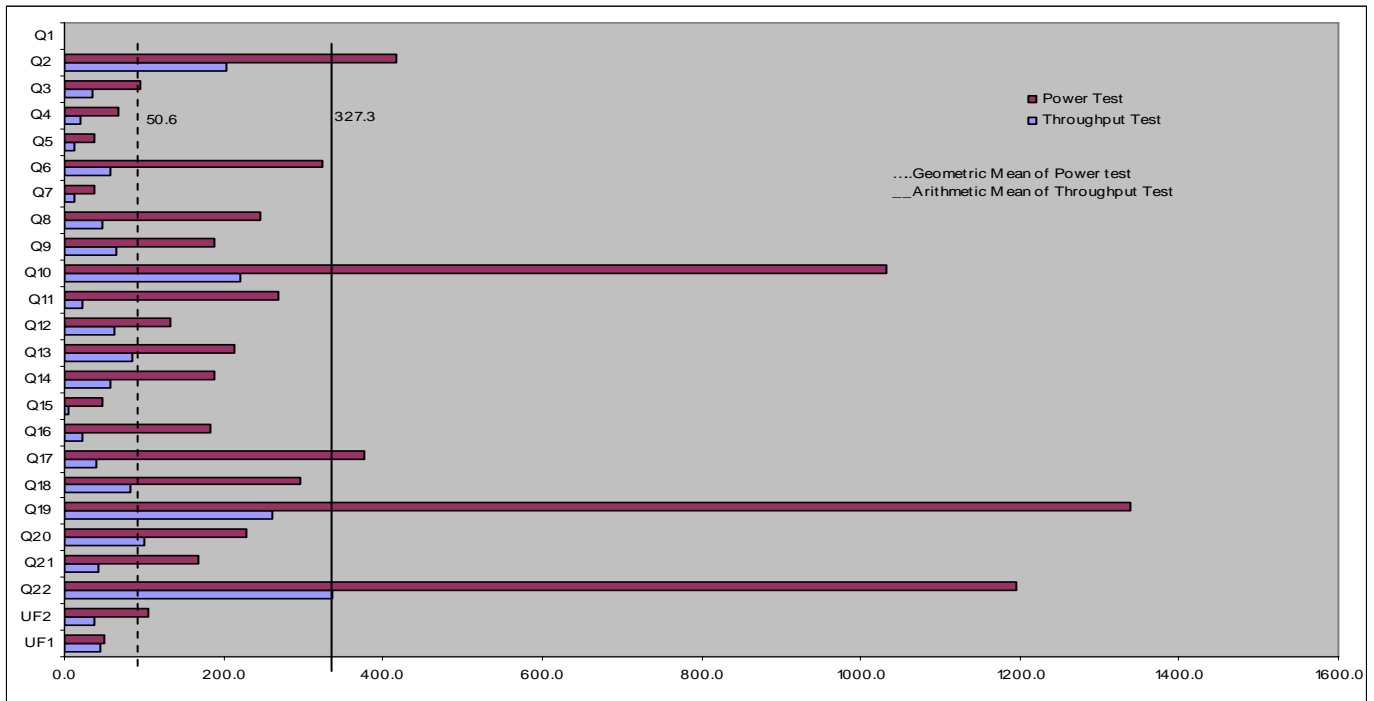
Operating System

**Red Hat Enterprise
Linux 4 ES**

Other
Software

Availability Date

November 11, 2005



Database Load Time = 1:42:55

Load Included Backup: Y

Total Data Storage / Database Size = 23.51

RAID (Base tables only): N

RAID (Base tables and auxiliary data structures): N

RAID (All): N

8 ProLiant server blade BL25p :

- Processors (per blade): 1 x Dual-Core AMD Opteron™ processor Model 280 (2.4GHz/1MB L2 cache per core for 2MB total/1 GHz HyperTransport)
- Cores (per blade) : 2
- Threads (per blade) : 2
- Memory (per blade) : 8 GB
- OS Disk Drives (per blade) : 2 x 36GB 15krpm HDD Ultra320
- Network (per blade) : 2 x on-board GigE (one of them as cluster interconnect)
- Host Bus Adapter (per blade) : 2 x on-board
- Storage Area Network : 2 x hp StorageWorks SAN Switch 2/16
16 x hp StorageWorks MSA1000
208 x 36GB 15krpm HDD Ultra320
- Total Storage : 7055.11 GB



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Description	Part Number	Brand	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware							
Configurable-HP ProLiant BL25p Server Blade; Dual Core AMD® Opteron™ 280 2.4GHz Processor	392439-B21		1	3,152	8	25,216	
HP 4GB Reg PC3200 2x2GB Memory	379300-B21		1	2,049	16	32,784	
36GB 15Krpm U320 UNI HDD	286776-B22		1	299	16	4,784	
HP BL25/45p Fiber Channel Adapter	381881-B21		1	599	8	4,792	
HP Care Pack 3-year, 4-hour, 24x7	UD188E		1	295	8		2,360
HP 5642 Unassembled Rack	358254-B21		1	689	2	1,378	
HP BladeSystem p-Class Server Blade Enclosure	243564-B22		1	1,499	1	1,499	
HP ProLiant BL p-Class C-GbE2 Interconnect Kit	283192-B21		1	4,399	1	4,399	
HP BLp 1U Pwr Encl w/6 Pwr Sply Kit	378284-B21		1	2,299	1	2,299	
Blade Enclosure Care Pack 3yr 4hr 24x7	HC032E		1	737	1		737
HP T2200 XR High Voltage US UPS	204451-002		1	749	2	1,498	
HP CAT5 KVM USB 1 Pack Interface Adapter	336047-B21		1	99	1	99	
HP s7540 17in. CRT Monitor	PF997AA#ABA		1	149	1	149	
USB Optical Mouse cbt/slvr USB 2-Button Optical Scroll Mouse	PT951AV		1	5	1	5	
Standard Keyboard USB	DX752AV#ABA		1	12	1	12	
					Subtotal	78,914	3,097
Storage							
HP Storageworks Modular SAN Array 1000	201723-B22		1	6,995	16	111,920	
36GB, 15krpm HDD Ultra320 HP	286776-B22		1	299	192	57,408	
2Gb SFF-SW Trncvr Kit ALL 2GB Small Form Pluggable Adapter Kit	221470-B21		1	199	32	6,368	
5m LC to LC Cable Kit	221692-B22		1	82	32	2,624	
HP StorageWorks Modular SAN Array 1000 Support 3YR 24x7 4HR	402164-002		1	3,538	16		56,608
HP StorageWorks SAN switch 2/16V	AA978A		1	9,990	2	19,980	
HP CP 3Y 4H 24x7 HW Edge Switch 2/16	340466-002		1	4,141	2		8,282
					Subtotal	198,300	64,890
Software							
Oracle Database 10g Enterprise Edition Release 2, Named User Plus for 3 Years	run-time	Oracle	2	10,000	12*	120,000	
Oracle Real Application Clusters, Named User Plus for 3 Years	run-time	Oracle	2	5,000	12*	60,000	
Partitioning, Named User Plus for 3 Years	run-time	Oracle	2	2,500	12*	30,000	
Database Server Support Package for 3 Years	run-time	Oracle	2	16,000	3		48,000
HP Red Hat Enterprise Linux ES v4, 3 year unlimited support	394317-B26		1	2,157	8	17,256	Included
					Subtotal	227,256	48,000
HP Large Purchase and Net30 discount			1			(47,115)	(10,878)
Oracle Mandatory E-Business Discount			2			(38,700)	
					Total	418,655	105,109
					3-Year Cost of Ownership:		\$523,764
					QpH Rating:		18725.9
					\$/ QpH@300GB:		\$27.97

Pricing: 1-HP Direct: 800-203-6748 at 16% discount.

Pricing: 2-Oracle at 15% discount, Oracle pricing contact: Mary Beth Pierantoni, mary.beth.pierantoni@oracle.com, 916-315-5081.

* 12 = 0.75 * 16. Explanation: For the purposes of counting the number of processors which require licensing, a multicore chip with "n" cores shall be determined by multiplying "n" cores by a factor of .75.

All discounts are based on US list prices and for similar quantities and configurations.

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 the TPC at pricing@tpc.org. Results independently audited by Loma Livingtree of Performance Metrics .Inc.Thank you



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Numerical Quantities

Measurement Results:

Database Scale Factor = 300
 Total Data Storage / Database Size = 23.51
 Start of Database Load = 10/27/2005 16:10:35
 End of Database Load = 10/27/2005 17:31:19
 Database Load Time = 01:20:44
 Database Load Time + Backup Time = 01:42:55

Query Streams for Throughput Test = 6
 TPC-H Power = 21338.2
 TPC-H Throughput = 16433.4
 TPC-H Composite Query-per-Hour Metric (QphH@300GB) = 18725.9
 Total System Price Over 3 Years = \$523,764
 TPC-H Price/ Performance Metric (\$/QphH@300GB) = \$27.97

Measurement Intervals:

Measurement Interval in Throughput Test (Ts) = 8675 seconds

Duration of Stream Execution:

	Seed	Query Start Time Query End Time	RF1 Start Time RF1 End Time	RF2 Start Time RF2 End Time	Duration
Stream 0	1027173119	10/27/2005 20:54:00	10/27/2005 20:53:10	10/27/2005 21:24:34	0:32:09
		10/27/2005 21:24:34	10/27/2005 20:54:00	10/27/2005 21:25:19	
Stream 1	1027173120	10/27/2005 21:25:20	10/27/2005 23:40:01	10/27/2005 23:40:49	2:16:08
		10/27/2005 23:29:29	10/27/2005 23:40:49	10/27/2005 23:41:28	
Stream 2	1027173121	10/27/2005 21:25:20	10/27/2005 23:41:28	10/27/2005 23:42:15	2:17:35
		10/27/2005 23:40:01	10/27/2005 23:42:15	10/27/2005 23:42:55	
Stream 3	1027173122	10/27/2005 21:25:20	10/27/2005 23:42:55	10/27/2005 23:43:48	2:19:16
		10/27/2005 23:31:38	10/27/2005 23:43:48	10/27/2005 23:44:36	
Stream 4	1027173123	10/27/2005 21:25:20	10/27/2005 23:44:36	10/27/2005 23:45:19	2:20:45
		10/27/2005 23:04:49	10/27/2005 23:45:19	10/27/2005 23:46:05	
Stream 5	1027173124	10/27/2005 21:25:20	10/27/2005 23:46:05	10/27/2005 23:46:49	2:22:39
		10/27/2005 23:19:16	10/27/2005 23:46:49	10/27/2005 23:47:59	
Stream 6	1027173125	10/27/2005 21:25:20	10/27/2005 23:47:59	10/27/2005 23:49:01	2:24:35
		10/27/2005 23:26:51	10/27/2005 23:49:01	10/27/2005 23:49:55	



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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	Min Qi	Max Qi	Avg Qi
Q1	202.8	404.6	234.9	506.7	427.7	500.2	433.1	234.9	506.7	417.9
Q2	35.4	65.2	113.9	96.6	47.2	87.8	156.4	47.2	156.4	94.5
Q3	19.9	74.3	18.2	52.3	66.2	95.8	104.1	18.2	104.1	68.5
Q4	12.9	26.5	10.9	58.9	28.7	65.0	28.8	10.9	65.0	36.5
Q5	56.9	221.1	452.4	321.2	337.5	373.5	233.8	221.1	452.4	323.3
Q6	13.6	32.7	32.4	45.7	18.1	32.2	61.0	18.1	61.0	37.0
Q7	48.6	203.7	327.8	273.8	355.8	190.8	128.8	128.8	355.8	246.8
Q8	65.4	208.9	161.8	203.2	149.4	155.1	257.1	149.4	257.1	189.3
Q9	221.3	920.2	2257.4	992.9	437.5	799.4	790.1	437.5	2257.4	1032.9
Q10	23.2	474.9	830.0	78.1	106.5	43.8	79.9	43.8	830.0	268.9
Q11	61.9	115.1	53.8	189.6	116.0	169.3	157.7	53.8	189.6	133.6
Q12	85.6	238.3	203.2	135.6	178.6	302.2	227.2	135.6	302.2	214.2
Q13	57.4	201.3	172.9	188.9	167.9	209.7	187.6	167.9	209.7	188.1
Q14	4.5	43.0	64.8	27.3	37.3	58.0	60.8	27.3	64.8	48.5
Q15	22.4	154.0	200.0	215.4	133.6	154.3	247.0	133.6	247.0	184.1
Q16	40.9	345.0	907.7	260.8	162.5	320.2	271.7	162.5	907.7	378.0
Q17	84.1	212.7	439.9	322.0	145.7	339.6	315.2	145.7	439.9	295.9
Q18	260.0	1807.9	806.1	1501.7	1114.1	1436.3	1371.5	806.1	1807.9	1339.6
Q19	101.4	332.4	274.0	203.9	143.0	151.4	264.2	143.0	332.4	228.2
Q20	43.0	91.7	45.2	156.3	224.6	63.3	431.2	45.2	431.2	168.7
Q21	335.4	1178.2	281.8	1678.4	1445.8	1186.8	1398.5	281.8	1678.4	1194.9
Q22	37.7	97.8	191.5	68.4	124.8	101.5	85.9	68.4	191.5	111.7
UF1	49.9	48.0	47.0	53.0	43.0	44.0	62.0	43.0	62.0	49.5
UF2	45.5	39.0	40.0	48.0	46.0	70.0	54.0	39.0	70.0	49.5