



HP Integrity Superdome - Itanium/1.6 GHz/18MB iL3 - 64p/128c

TPC-H Rev 2.6.2

Report Date:
March 10, 2008

Total System Cost

Composite Query per Hour Metric

Price/Performance

\$5,829,685 USD

208,457.7

\$27.97 USD

QphH@10000GB

QphH@10000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

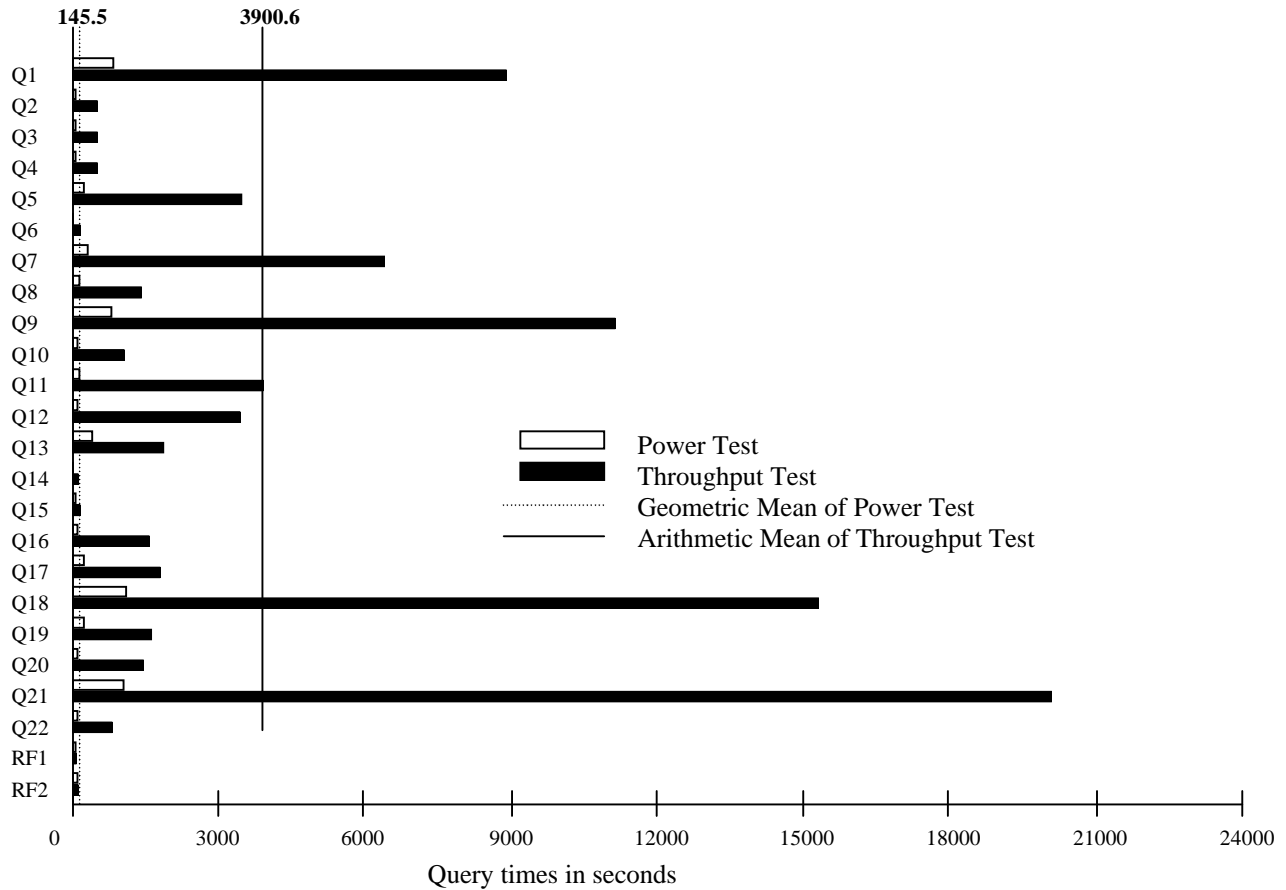
10000 GB*

**Oracle Database 11g
Enterprise Edition with
Partitioning and Oracle
Automatic Storage
Management**

HP-UX 11i v3 64-bit

None

09/10/2008



Database Load Time = 06:31:27

Load Includes Backup: N

Total Data Storage/Database Size = 44.87

RAID (Base Tables Only): N

RAID (Base Tables and Auxiliary Data Structures): N

RAID (All): Y

System Configuration

Number of Nodes: 1
 Processors/Cores/Threads/Type: 64/128/128/Intel Itanium 9140 1.6GHz, 9MB iL3 cache per core
 Memory: 512 GB
 Disk Drives: 1 HP Surestore Disk System 2120 with 4 36GB disks and
 256 HP StorageWorks MSA1000 (with total of 3072 146GB 15K RPM disks)
 Total Disk Storage: 448656GB (In this number one GB is defined as 1024*1024*1024 bytes)
 Lan Controllers: 1 PCI 1000BT Lan Adapter

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



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Description	Part Number	Source	Reference Price	Qty	Extended Price	3 yr Maint Price
Server Hardware						
Superdome left chassis	A9834A, Opt 429	1	235,950	1	235,950	
Superdome right chassis	A9835A, Opt 429	1	249,950	1	249,950	
Superdome sx2000 Cell Board	A9837A	1	19,250	16	308,000	
24x7x4hr - 3 Year Svc & Support Price (Hardware and Software)						1,256,004
256GB Memory Bundle (128x2GB dimms)	A9856A	1	611,950	2	1,223,900	
12-Slot PCI-X I/O Chassis	A9836A	1	16,950	16	271,200	
Dual-Core Intel Itanium 9140N/1.6GHz/18MB L3	AD371A	1	23,000	64	1,472,000	
PCI-X 2 port 1000Base-SX Gigabit Adapter	A7011A	1	1,995	1	1,995	
PCI-X 4GB Fibre Channel Adapter (dual port)	AB379B	1	3,495	128	447,360	
PCI Dual Channel Ultra320 SCSI Adapter	A7173A	1	795	1	795	
HPDisk System 2120	A7382A	1	995	1	995	
1-36GB LP 15K HDD	A7527A	1	966	4	3,864	
HP Universal Rack 10642 G2 Pallet Rack	AF001A	1	1,249	1	1,249	
200-240 volt Modular Power Distribution Unit	252663-B24	1	299	1	299	
HP Tape Array 5300	C7508B	1	729	1	729	
HP DVD + RW Array Field Module	Q1592B	1	649	1	649	
HP rx2660 Server (inc mem/disk/monitor/keyboard/mouse)	AB419A	1	8,557	1	8,557	
I/O Chassis Enclsoure for 12-Slot PCI-X Chassis	A9852A	1	25,750	4	103,000	
Graphite I/O expansion power subsystem	A5861D	1	34,860	2	69,720	
Subtotal					4,400,212	1,256,004
Server Software						
Oracle Database 11g Enterprise Edition, Named User Plus for 3 years**		2	10,000	64	640,000	
Partitioning, Named User Plus for 3 years**		2	2,500	64	160,000	
Oracle Database Server Support Package for 3 years**		2	6,000	1		6,000
HP-UX 11i v3 Foundation Operating Environment	B9429AC	1	2,370	128	303,360	
HP-UX 11i v3 HP9000/Integrity FOE Media	BA489AA, Opt AJR	1	565	1	565	
Subtotal					1,103,925	6,000
Storage						
5m Fibre Channel Cables	221692-B22	1	82	256	20,992	
HP StorageWorks MSA 1000 (256 + 26 spares)	201723-B22	1	6,499	282	1,832,718	
3 Yr Support Price for MSA1000 and disks						Included
146GB 15K Ultra320 Hard Drive (3072 + 308 spares)	347708- B22	1	509	3,380	1,720,420	
HP Universal Rack 10642 G2 Pallet Rack	AF001A	1	1,249	28	34,972	
200-240 volt Modular Power Distribution Unit	252663-B24	1	299	112	33,488	
ProLiant Cluster HA/200 for MSA1000	252409-B22	1	4,007	1	4,007	
Subtotal					3,646,597	0
Total					9,150,734	1,262,004
Oracle Mandatory E-Business Discount on (Licenses and Support)					(161,200)	
42.5 % Large Configuration Discount and Support Prepayment*					(3,743,611)	(678,242)
Grand Total					5,245,923	583,762
*All discounts are based on US list prices and for similar quantities and configurations					3-yr Cost of Ownership:	5,829,685
** These components are not immediately orderable. See FDR for more information					QphH@10000GB:	208,458
Source 1=HP, 2=Oracle					\$/QphH@10000GB:	27.97
Audited By: Francois Raab for InfoSizing (www.sizing.com)						

Prices used in TPC benchmarks reflect 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 the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.



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Measurement Results

Database Scaling (SF/size)	10000
Total Data Storage/Database Size	44.87
Start of Database Load Time	02/21/08 13:27:35
End of Database Load Time	02/21/08 19:59:02
Database Load Time	6:31:27
Query Streams for Throughput Test (S)	24
TPC-H Power	247,445.4
TPC-H Throughput	175,613.0
TPC-H Composite Query-per-Hour Metric (QphH@10000GB)	208,457.7
Total System Price Over 3 Years	5,829,685
TPC-H Price/Performance Metric (\$/QphH@10000GB)	27.97

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	108,238
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Duration of Stream Execution:

Power Run	Seed	RF1 Start Time	Query Start Time	RF2 Start Time	Duration (sec)
		RF1 End Time	Query End Time	RF2 End Time	
	221195902	02/23/08 04:03:26 02/23/08 04:04:40	02/23/08 04:04:40 02/23/08 05:47:06	02/23/08 05:47:06 02/23/08 05:49:04	6,338

Throughput Stream	Seed	Query Start Time Query End Time	Duration (sec)	RF1 Start Time RF1 End Time	RF2 Start Time RF2 End Time
1	221195903	02/23/08 05:49:05 02/24/08 09:06:45	98,260	02/24/08 10:43:00 02/24/08 10:44:09	02/24/08 10:44:09 02/24/08 10:46:04
2	221195904	02/23/08 05:49:05 02/24/08 03:32:45	78,220	02/24/08 10:46:04 02/24/08 10:47:03	02/24/08 10:47:03 02/24/08 10:48:59
3	221195905	02/23/08 05:49:05 02/23/08 22:09:18	58,813	02/24/08 10:48:59 02/24/08 10:49:59	02/24/08 10:49:59 02/24/08 10:51:53
4	221195906	02/23/08 05:49:05 02/24/08 02:20:54	73,909	02/24/08 10:51:53 02/24/08 10:52:52	02/24/08 10:52:52 02/24/08 10:54:46
5	221195907	02/23/08 05:49:05 02/24/08 06:31:06	88,921	02/24/08 10:54:46 02/24/08 10:55:44	02/24/08 10:55:44 02/24/08 10:57:40
6	221195908	02/23/08 05:49:05 02/24/08 03:29:41	78,036	02/24/08 10:57:41 02/24/08 10:58:39	02/24/08 10:58:39 02/24/08 11:00:35
7	221195909	02/23/08 05:49:05 02/24/08 10:37:35	103,710	02/24/08 11:00:35 02/24/08 11:01:33	02/24/08 11:01:33 02/24/08 11:03:28
8	221195910	02/23/08 05:49:05 02/23/08 19:25:51	49,006	02/24/08 11:03:28 02/24/08 11:04:36	02/24/08 11:04:36 02/24/08 11:06:33
9	221195911	02/23/08 05:49:05 02/24/08 08:29:23	96,018	02/24/08 11:06:33 02/24/08 11:07:30	02/24/08 11:07:30 02/24/08 11:09:27
10	221195912	02/23/08 05:49:06 02/24/08 10:42:59	104,033	02/24/08 11:09:27 02/24/08 11:10:25	02/24/08 11:10:25 02/24/08 11:12:20



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Duration of Stream Execution (Continued):

Throughput Stream	Seed	Query Start Time Query End Time	Duration (sec)	RF1 Start Time RF1 End Time	RF2 Start Time RF2 End Time
11	221195913	02/23/08 05:49:06 02/24/08 08:47:29	97,103	02/24/08 11:12:20 02/24/08 11:13:20	02/24/08 11:13:20 02/24/08 11:15:15
12	221195914	02/23/08 05:49:06 02/24/08 09:41:43	100,357	02/24/08 11:15:15 02/24/08 11:16:13	02/24/08 11:16:13 02/24/08 11:18:10
13	221195915	02/23/08 05:49:06 02/24/08 09:40:10	100,264	02/24/08 11:18:10 02/24/08 11:19:08	02/24/08 11:19:08 02/24/08 11:21:05
14	221195916	02/23/08 05:49:06 02/24/08 08:52:42	97,416	02/24/08 11:21:05 02/24/08 11:22:06	02/24/08 11:22:06 02/24/08 11:24:02
15	221195917	02/23/08 05:49:06 02/23/08 22:46:54	61,068	02/24/08 11:24:02 02/24/08 11:25:01	02/24/08 11:25:01 02/24/08 11:26:57
16	221195918	02/23/08 05:49:06 02/24/08 05:05:51	83,805	02/24/08 11:26:57 02/24/08 11:27:59	02/24/08 11:27:59 02/24/08 11:29:55
17	221195919	02/23/08 05:49:06 02/24/08 08:16:13	95,227	02/24/08 11:29:55 02/24/08 11:30:56	02/24/08 11:30:56 02/24/08 11:32:49
18	221195920	02/23/08 05:49:06 02/24/08 01:07:13	69,487	02/24/08 11:32:49 02/24/08 11:33:46	02/24/08 11:33:46 02/24/08 11:35:43
19	221195921	02/23/08 05:49:06 02/24/08 01:49:14	72,008	02/24/08 11:35:44 02/24/08 11:36:43	02/24/08 11:36:43 02/24/08 11:38:37
20	221195922	02/23/08 05:49:06 02/24/08 10:43:00	104,034	02/24/08 11:38:37 02/24/08 11:39:38	02/24/08 11:39:38 02/24/08 11:41:32
21	221195923	02/23/08 05:49:06 02/24/08 06:20:59	88,313	02/24/08 11:41:32 02/24/08 11:42:28	02/24/08 11:42:28 02/24/08 11:44:21
22	221195924	02/23/08 05:49:06 02/24/08 04:42:49	82,423	02/24/08 11:44:21 02/24/08 11:45:22	02/24/08 11:45:22 02/24/08 11:47:14
23	221195925	02/23/08 05:49:06 02/24/08 09:23:05	99,239	02/24/08 11:47:14 02/24/08 11:48:14	02/24/08 11:48:14 02/24/08 11:50:08
24	221195926	02/23/08 05:49:06 02/24/08 03:59:34	79,828	02/24/08 11:50:08 02/24/08 11:51:08	02/24/08 11:51:08 02/24/08 11:53:03



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TPC-H Timing Intervals (in seconds)

Duration of stream execution:

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	828.5	51.9	49.1	42.1	227.2	33.6	294.8	135.2	795.4	98.1	151.6	111.7
Stream 01	4794.0	376.2	598.1	0.2	0.2	280.7	9575.8	1376.9	10321.2	1613.8	3702.2	4732.2
Stream 02	12812.6	430.8	0.6	791.7	3916.9	480.1	4661.9	1473.0	13208.8	1668.7	6176.4	2516.6
Stream 03	8648.4	351.4	947.5	0.3	4621.5	236.5	6722.0	1951.0	10290.5	0.2	2870.8	4178.9
Stream 04	8163.1	310.5	838.9	415.0	5713.3	144.7	12389.6	1180.9	7420.8	1340.4	2448.3	3113.0
Stream 05	10689.8	925.4	1020.0	477.9	0.3	212.5	5366.8	1427.9	7331.6	0.4	2982.5	3568.5
Stream 06	8639.9	466.8	708.0	527.4	7035.7	191.4	6813.4	1275.9	10861.8	3430.6	7867.0	5421.5
Stream 07	5489.2	395.8	76.9	575.4	343.3	72.4	481.2	2319.6	3809.0	219.0	1689.2	489.9
Stream 08	8473.1	334.8	463.2	577.1	4396.3	62.2	6440.8	1591.3	11708.5	1139.5	2364.5	4115.9
Stream 09	11060.6	1118.9	568.9	0.1	2693.3	0.3	6614.0	1927.8	8380.4	0.9	10643.8	1939.5
Stream 10	12451.9	386.1	114.9	110.3	323.7	390.7	6849.2	370.0	3804.9	640.4	318.3	2222.6
Stream 11	6241.4	345.2	572.6	504.9	4100.9	171.8	4183.7	1108.8	15167.9	1205.2	4262.3	970.4
Stream 12	13835.5	422.2	109.2	669.5	3395.3	302.5	6802.2	2191.6	14733.2	666.9	2333.7	3295.4
Stream 13	9098.3	92.2	747.8	97.3	1463.8	67.9	12405.3	270.8	9512.3	1374.4	2080.1	3059.8
Stream 14	7516.8	131.9	396.0	504.8	4608.4	46.5	10607.5	1086.9	23510.1	0.1	3494.0	1054.8
Stream 15	7386.2	1085.9	448.6	1042.3	3396.8	188.5	4301.4	1728.6	15487.5	1861.7	2156.2	2139.0
Stream 16	14025.9	1000.7	706.6	826.9	4517.4	183.9	7383.9	1147.4	9804.4	1726.5	5107.1	2221.8
Stream 17	6983.6	1054.3	679.0	0.3	5080.1	132.3	6853.0	1357.9	16794.3	0.1	2353.9	1670.6
Stream 18	6913.5	373.6	537.4	940.7	4759.0	0.1	9313.5	989.9	10265.4	1349.9	1749.3	3210.4
Stream 19	10806.8	738.4	478.1	914.7	4214.8	76.7	3806.7	1535.9	9037.1	1866.9	8995.1	7412.1
Stream 20	8577.2	242.1	0.1	796.0	2995.6	0.3	11045.4	391.6	7001.5	1350.3	316.5	3143.1
Stream 21	11199.9	347.4	0.2	546.4	4344.5	182.1	0.1	1381.7	8926.2	0.1	6772.0	2915.5
Stream 22	7247.7	416.8	893.3	638.6	4742.4	0.3	0.2	2408.6	14950.4	1413.1	3148.7	4352.1
Stream 23	5585.2	343.5	175.2	163.6	1801.6	132.3	0.1	1396.8	14431.9	176.1	1990.2	5880.1
Stream 24	6836.7	293.0	471.4	504.7	4556.3	0.2	10461.1	1043.0	9797.2	1753.8	7048.6	8694.3
Minimum	4794.0	92.2	0.1	0.1	0.2	0.1	0.1	270.8	3804.9	0.1	316.5	489.9
Maximum	14025.9	1118.9	1020.0	1042.3	7035.7	480.1	12405.3	2408.6	23510.1	3430.6	10643.8	8694.3
Average	8894.9	499.3	481.3	484.4	3459.2	148.2	6378.3	1372.2	11106.5	1033.3	3869.6	3429.9



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TPC-H Timing Intervals (in seconds)

Duration of stream execution:

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	381.4	32.0	42.2	90.1	223.8	1073.5	226.7	120.9	1054.7	81.2	73.2	118.4
Stream 01	0.2	0.2	0.3	1783.9	2503.4	0.2	1597.4	1736.4	52707.6	558.7	69.0	114.6
Stream 02	4884.5	0.3	0.2	2075.7	3178.1	16027.2	1990.2	1243.1	0.3	682.3	59.2	116.2
Stream 03	3907.4	0.1	0.1	1645.5	2040.8	7590.7	1520.7	593.7	0.5	694.6	59.7	114.2
Stream 04	0.4	0.2	0.1	1369.7	1443.6	3847.6	1469.0	1887.0	19457.1	955.9	58.3	114.3
Stream 05	0.2	0.5	0.1	1733.6	1791.1	130.6	1700.7	2284.8	46225.7	1049.8	58.2	116.0
Stream 06	4555.1	0.1	0.1	2403.6	1679.9	12589.9	1845.8	867.9	0.1	853.7	58.4	115.6
Stream 07	0.2	0.1	0.1	204.4	1433.9	57195.5	298.1	3718.9	24395.1	502.8	58.6	114.5
Stream 08	0.1	0.1	0.5	936.7	1841.0	0.1	3159.8	699.7	0.1	700.7	68.4	116.6
Stream 09	4374.3	0.4	0.1	1153.2	1659.7	18957.0	2773.6	1284.2	19783.0	1083.2	57.5	116.6
Stream 10	3127.6	0.1	974.2	381.4	2209.0	54482.7	401.9	175.8	13478.2	819.5	57.4	115.6
Stream 11	0.4	503.3	730.8	1787.2	1456.5	30577.0	1446.2	1083.8	19886.8	796.5	60.0	115.1
Stream 12	0.3	0.1	0.1	1643.0	1870.6	33043.5	731.9	1548.4	11514.5	1247.9	57.7	117.0
Stream 13	0.1	0.1	0.1	1198.5	2126.0	0.1	505.8	212.9	55434.1	516.8	57.6	117.1
Stream 14	0.2	127.8	0.5	2482.0	2332.7	20918.8	1254.7	1477.1	15148.5	716.1	60.4	116.4
Stream 15	0.2	0.2	0.3	759.0	1771.8	0.3	2162.3	778.8	13678.5	694.2	58.7	115.6
Stream 16	3381.8	0.1	356.9	1628.6	1820.8	0.2	1369.4	1673.2	24098.4	823.0	62.1	115.9
Stream 17	3489.3	0.4	0.1	2254.2	2150.9	0.1	577.6	718.5	42339.0	738.1	60.8	113.3
Stream 18	4373.8	769.3	0.4	2840.4	1125.6	0.6	1511.5	655.0	16590.8	1216.8	57.3	117.1
Stream 19	0.2	0.1	564.5	1610.0	1772.3	0.3	2566.9	1452.7	13315.9	842.1	59.0	114.8
Stream 20	4438.3	0.1	591.4	1054.5	1103.1	49262.8	2932.3	605.1	7134.6	1052.0	60.3	113.9
Stream 21	0.2	0.4	0.1	2357.8	409.5	0.2	1950.5	5664.7	40559.6	753.3	56.7	112.6
Stream 22	4218.7	341.1	0.2	1263.9	1874.4	6381.4	1499.8	2027.8	23935.8	667.3	60.7	112.2
Stream 23	0.1	0.2	0.2	1525.0	1182.8	55847.3	539.4	329.1	6924.9	812.7	59.6	114.0
Stream 24	3902.7	348.9	0.3	1584.3	2228.7	0.1	2579.9	1409.8	15733.8	579.2	60.2	115.1
Minimum	0.1	0.1	0.1	204.4	409.5	0.1	298.1	175.8	0.1	502.8	56.7	112.2
Average	4884.5	769.3	974.2	2840.4	3178.1	57195.5	3159.8	5664.7	55434.1	1247.9	69.0	117.1
Maximum	1860.7	87.3	134.2	1569.8	1791.9	15285.6	1599.4	1422.0	20097.6	806.5	59.8	115.2