



HP Integrity Superdome Enterprise Server

TPC-H Rev 2.1.0

Report Date: December 31, 2003

Total System Cost
\$4,922,070

Composite Query per Hour Metric
45,247.8
QphH@3000GB

Price/Performance
\$109
QphH@3000GB

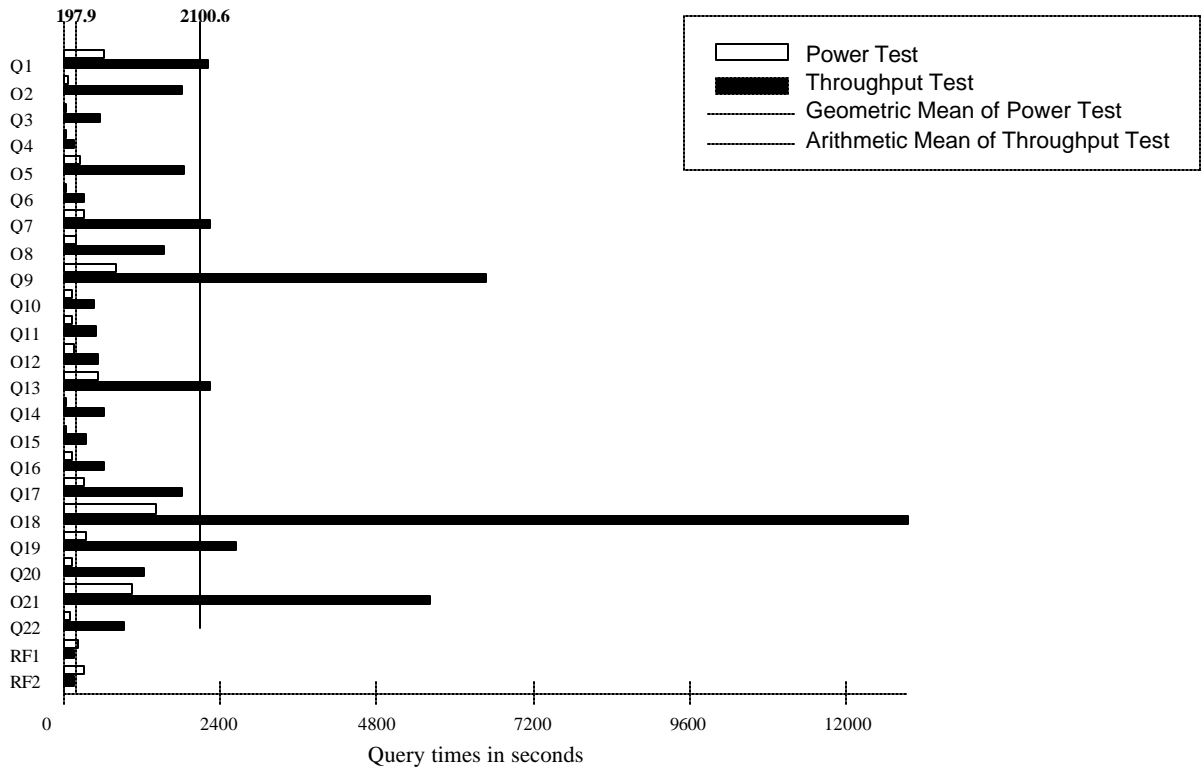
Database Size
3000 GB*

Database Manager
Oracle 10g Database Enterprise Edition with Partitioning

Operating System
HP-UX 11.i V2 64-bit

Other Software
None

Availability Date
March 25, 2004



Database Load Time = 05:42

Load Includes Backup: N

Total Data Storage/Database Size = 26.33

RAID (Base Tables Only): N

RAID (Base Tables and Auxiliary Data Structures): N

RAID (All): Y

System Configuration

Processors: 64 Itanium2 1.5GHz, 6MB L3 Cache
 Memory: 256 GB
 Disk Drives: 1 hp surestore disk system 2100 with 4 - 36GB 1-36GB LP 10K LVD SE U320 HDD disks and 72 SureStore VA7110 (with a total of 1080 73GB 15K RPM LVD disks)
 Total Disk Storage: 78984GB (In this calculation one GB is defined as 1024*1024*1024 bytes)
 Lan Controllers: 1 HP 10/100 Base-T 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						
Super Dome left chassis	A5201A, Opt. 429	1	205,840	1	205,840	
Super Dome right chassis	A5202A, Opt. 429	1	218,435	1	218,435	
IPF Superdome Cell Board (sx1000)	A6866A	1	16,000	16	256,000	
3 Year Svc & Support Price (Hardware and Software)						838,197
4GB SDRAM (4x1GB DIMMS)	A6863A	1	17,750	64	1,136,000	
PCI-x I/O chassis	A6864A	1	16,805	12	201,660	
Core I/O Card	A6865A	1	1,045	1	1,045	
CPU Itanium 2, 1.5GHz w/6MB iL 3 cache (2 CPUs)	A6924A	1	40,000	32	1,280,000	
PCI 1000BT Lan Adapter	A6847A, Opt. 0D1	1	2,135	1	2,135	
I/O chassis enclosure for PCI chassis	A5862A	1	25,725	2	51,450	
Graphite I/O expansion power subsystem	A5861D	1	34,860	1	34,860	
PCI 2GB Fibre Channel Adapter	A6795A	1	2,240	72	161,280	
PCI Ultra160 SCSI Adapter	A6828A	1	1,323	1	1,323	
hp Surestore Disk System 2100	A5675A	1	700	1	700	
1-36GB LP 10K LVD SE U320 HDD	A6571A	1	720	4	2,880	
TA5300 Enclosure for DAT tape	C7508AZ	1	1,395	1	1,395	
DDS 4 tape	C5687B	1	1,450	1	1,450	
DVD Rom drive	C7499A	1	688	1	688	
SCSI Terminator LVD/SE HDTS68 Multimedia	C2364A	1	100	1	100	
HP Tape Array PSU/Fan Kit	C7496A	1	425	1	425	
SCSI Cable 10m VHDS68/DHDS68 M/M Multimd	C2363B	1	335	1	335	
SCSI Cable 0.5m HDTS68 M/M Multimedia	C2978B	1	99	1	99	
SMS for HP Integrity Superdome Tower	A9801A	1	5,140	1	5,140	
Subtotal					3,563,240	838,197
Server Software						
Oracle Database 10g Enerprise Edition for 3 years, Named User Plus		2	10,000	64	640,000	
Partitioning for 3 years, Named User Plus		2	2,500	64	160,000	
Oracle Database Server Support Package for 3 years:		2	6,000	1		6,000
HPUX 11i, V2 Foundation Operating Environment	B9429AC	1	2,370	64	151,680	
Subtotal					951,680	6,000
Storage						
16 meter Fibre Optic Cable	A7525A	1	260	72	18,720	
Surestore VA 7110 w/ dual controller, 1024MB mem:	A7294A	1	25,440	72	1,831,680	
*(large quantity discount)						
3 Year Support Price						273,168
73GB 15K RPM FC HDD (10% sparing included)*	A7288A, Opt 0D1	1	1,702	1188	2,022,392	103,680
*(large quantity discount)						
HP Rack System/E, 41U, Quartz Color	A4902A	1	1,910	6	11,460	
HP Rear Door for 41U Quartz Rack	A5213AZ	1	334	6	2,004	
Modular Power Dist.	A5137AZ	1	145	24	3,480	
200-240 Volts Power Option	A5137AZ, Opt AW4	1	94	24	2,256	
Subtotal					3,891,992	376,848
Total					8,406,912	1,221,045
Oracle Mandatory E-Business Discount on (Licenses and Support)					(161,200)	
Large Configuration Discount and Support Prepayment*					(3,952,665)	(592,022)
Grand Total					4,293,047	629,023
Source: 1=HP, 2=Oracle (Pricing Contact: MaryBeth Pierantoni; email: mary.beth.pierantoni@oracle.com; phone number: 650-506-2118)				3-yr Cost of Ownership:		4,922,070
				QphH@3000GB:		45,247.8
				\$/QphH@3000GB: \$		109
*All discounts are based on US list prices and for similar quantities and configurations						

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)	3000
Total Data Storage/Database Size	26.33
Start of Database Load Time	2003-09-16 21:55:03
End of Database Load Time	2003-09-17 03:37:26
Database Load Time	05:42
Query Streams for Throughput Test (S)	8
TPC-H Power	54,559.8
TPC-H Throughput	37,525.2
TPC-H Composite Query-per-Hour Metric (QphH@3000GB)	45,247.8
Total System Price Over 3 Years	\$4,922,070
TPC-H Price/Performance Metric (\$/QphH@3000GB)	\$109

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	50,654
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Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00	0917033726	09/17/2003 20:18:03	09/17/2003 22:25:57	2:07:54
Stream 01	0917033727	09/17/2003 22:26:45	09/18/2003 11:19:41	12:52:56
Stream 02	0917033728	09/17/2003 22:26:45	09/18/2003 11:31:0	13:04:15
Stream 03	0917033729	09/17/2003 22:26:45	09/18/2003 11:31:4	13:04:19
Stream 04	0917033730	09/17/2003 22:26:45	09/18/2003 10:34:17	12:07:32
Stream 05	0917033731	09/17/2003 22:26:45	09/18/2003 11:45:41	13:18:56
Stream 06	0917033732	09/17/2003 22:26:45	09/18/2003 11:43:41	13:16:56
Stream 07	0917033733	09/17/2003 22:26:45	09/18/2003 10:55:35	12:28:50
Stream 08	0917033734	09/17/2003 22:26:45	09/18/2003 10:54:41	12:27:56
Refresh		09/17/2003 22:26:45	09/18/2003 12:30:59	14:04:14



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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	615.0	92.6	64.7	48.0	245.9	44.9	301.1	204.3	817.6	135.8	147.3	186.9
Stream 01	837.5	1250.5	295.3	73.8	1571.7	181.6	2867.7	1443.2	5654.7	570.6	573.8	918.2
Stream 02	2861.1	1736.0	323.0	268.0	1998.0	153.0	1333.2	953.5	5857.3	791.9	962.6	797.3
Stream 03	2304.1	1806.3	82.9	407.3	2435.8	111.7	2305.0	759.3	6031.2	1010.9	468.0	353.4
Stream 04	2521.4	1183.6	250.9	257.1	2158.0	64.7	2117.4	754.8	5236.2	571.4	498.7	702.2
Stream 05	2310.7	1482.1	400.8	248.1	1669.3	108.7	2366.0	1976.0	4635.0	923.3	615.6	1470.8
Stream 06	2235.6	1853.2	566.7	169.5	1855.8	324.5	2255.4	1565.7	6482.4	471.8	505.6	532.2
Stream 07	2036.3	1377.3	209.0	240.5	1920.2	185.7	2178.6	880.9	6123.5	635.3	678.2	1143.7
Stream 08	2535.92	2117.58	124.49	129.31	1657.61	56.24	2096.65	994.41	6227.88	602.68	665.28	1370.17
Minimum	837.5	1183.6	82.9	73.8	1571.7	56.2	1333.2	754.8	4635.0	471.8	468.0	353.4
Average	2205.3	1600.8	281.6	224.2	1908.3	148.3	2190.0	1166.0	5781.0	697.2	621.0	911.0
Maximum	2861.1	2117.6	566.7	407.3	2435.8	324.5	2867.7	1976.0	6482.4	1010.9	962.6	1470.8

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	549.5	40.0	49.5	147.3	318.0	1437.2	342.4	145.9	1054.5	117.3	241.0	327.8
Stream 01	2385.6	590.6	345.2	711.7	1370.8	12537.8	2540.7	724.3	8195.2	736.0	209.2	229.8
Stream 02	1675.9	324.5	338.7	1104.2	2206.7	13090.7	2445.9	455.8	6610.4	768.1	177.4	172.9
Stream 03	2310.3	253.2	237.6	236.6	2979.9	13034.8	1858.2	739.3	6369.6	964.2	148.0	169.1
Stream 04	1831.1	381.4	624.4	583.1	1376.4	13123.9	1505.5	1299.7	5866.9	743.8	142.0	171.3
Stream 05	2399.6	344.2	239.5	897.8	2045.6	13066.5	2194.4	1111.9	6568.6	861.9	137.8	173.9
Stream 06	2264.1	635.4	367.2	626.8	1799.1	12930.5	2637.5	1222.4	5601.9	913.0	176.4	173.3
Stream 08	2093.07	278.69	312.93	528.27	1972.36	10937.7	2860.68	292.18	6236.59	785.47	135.5	175.71
Stream 07	3030.0	325.0	342.4	792.1	1471.9	14848.2	1245.6	420.5	4222.6	622.5	147.3	178.1
Minimum	1675.9	253.2	237.6	236.6	1370.8	10937.7	1245.6	292.2	4222.6	622.5	135.5	169.1
Average	2248.7	391.6	351.0	685.1	1902.8	12946.3	2161.1	783.3	6209.0	799.4	159.2	180.5
Maximum	3030.0	635.4	624.4	1104.2	2979.9	14848.2	2860.7	1299.7	8195.2	964.2	209.2	229.8