



HP 9000 Superdome Enterprise Server

TPC-H Rev 2

Report Date: August 26, 2002
Updated October 29, 2002

Total System Cost

Composite Query per Hour Metric

Price/Performance

\$5,761,053

27,094.3
QphH@3000GB

\$213
QphH@3000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

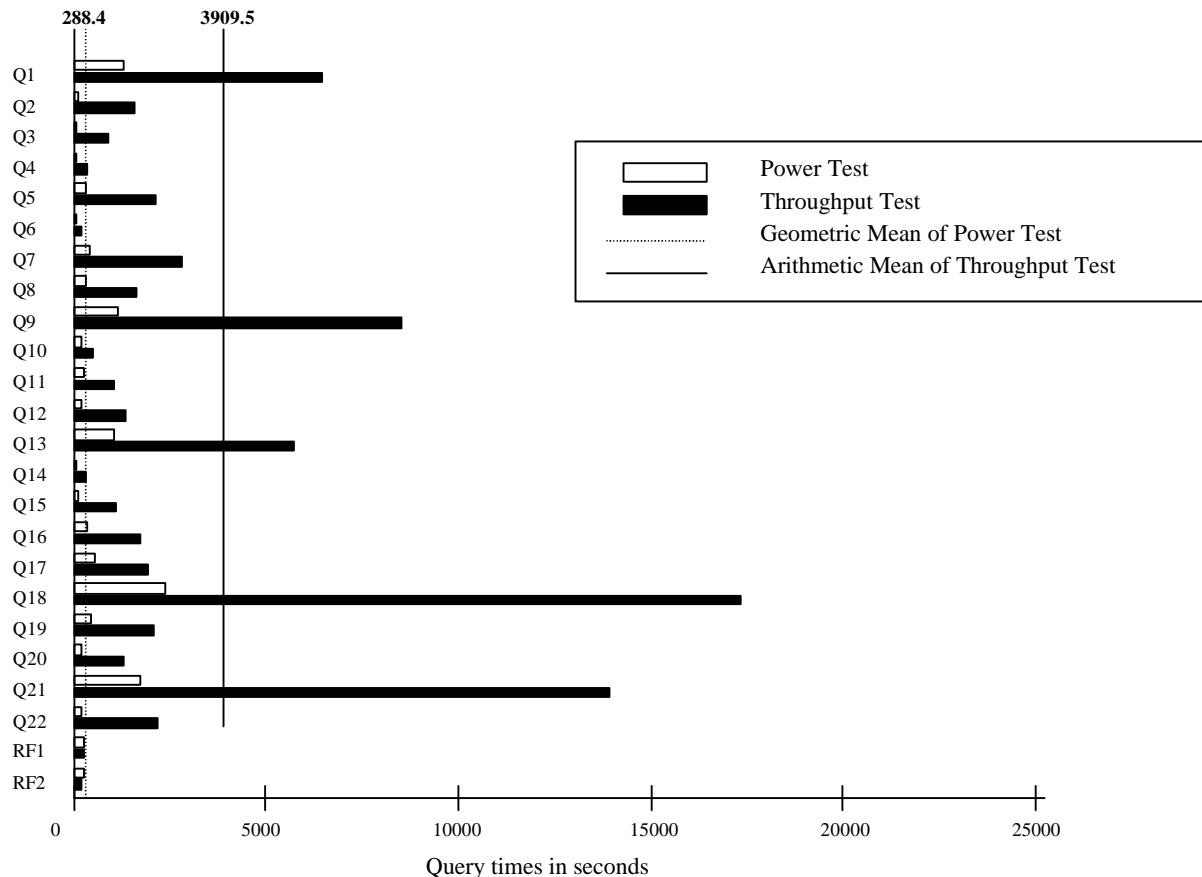
3000 GB*

**Oracle9i Database
Enterprise Edition with
Partitioning v9.2.0.2.0**

HP-UX 11.i 64-bit

None

October 30, 2002



Database Load Time = 08:48	Load Includes Backup: N	Total Data Storage/Database Size = 8.93
RAID (Base Tables Only): N	RAID (Base Tables and Auxiliary Data Structures): N	RAID (All): Y

System Configuration	
Processors:	64 PA-RISC 8700 875MHz, .75MB I-cache, 1.5MB D-cache
Memory:	128 GB
Disk Drives:	1 hp surestore disk system 2100 with 3 - 18GB Ultra 3 SCSI LVD disks and 99 SureStore VA7100 (with a total of 1485 18GB 15K RPM LVD disks)
Total Disk Storage	26784GB (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 (support includes hardware, services, and support)	A5201A, Opt. 429	1	205,840	1	205,840	268,626
Super Dome right chassis	A5202A, Opt. 429	1	218,435	1	218,435	
Memory module - 2 GB	A5198A, Opt. 0D1	1	14,000	64	896,000	
I/O enclosures	A4856A, Opt. 0D1	1	14,805	9	133,245	
PDCA Redundant Power Source	A5800A, Opt. 0D1	1	578	2	1,156	
Cell Board with 4 PA-8700 875MHz Processors	A6862A	1	10,080	16	161,280	
ICOD right to use processor (support includes hardware, services, and support)	A6885A, Opt. 429	1	23,000	64	1,472,000	403,392
Super Dome PCI Core I/O card	A6865A, Opt. 0D1	1	1,045	1	1,045	
I/O Expansion Power/Utilities Subsystem	A5861A	1	34,860	1	34,860	
I/O Chassis Enclosure (ICE)	A5862A	1	25,725	1	25,725	
1.6m Expansion Cabinet	A4901A	1	1,820	1	1,820	
PCI Dual FWD SCSI-2 Card	A5159A, Opt 0D1	1	1,245	2	2,490	
PCI 1000BT Lan Adapter	A4926A, Opt. 0D1	1	2,135	1	2,135	
PCI Fibre Channel 2X	A5158A, Opt 0D1	1	2,240	99	221,760	
RackInstallation Kit	A5170A, Opt 0D1	1	410	1	410	
DVD-ROM (includes SCSI-2 card, cables, enclosures)	C7499A	1	3,503	1	3,503	
HP9000 A500 Support Management Station (includes memory,CPU,lan card,disk,OS, etc)	A5570B	1	11,780	1	11,780	
hp surestore disk system 2100	A5675A	1	700	1	700	
1-18GB FWD disk module	A6537A	1	525	3	1,575	
5m SCSI-2 Cable	C2978B	1	99	1	99	
			Subtotal		3,395,858	672,018
Server Software						
Oracle9i Database Enterprise Edition Release 2, 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	0	6,000
HP-UX 11i LTU	B9088AC, Opt AAF	1		1	0	
HP-UX 11i Media	B3920EA, Opt UM9	1		1	0	
HP-UX 11i	B3920EA, Opt OD1	1		1	0	
HP-UX 11.i Factory Integration	B3920EA, Opt AAF	1	520	1	520	
			Subtotal		800,520	6,000
Storage						
Surestore VA 7100 w/dual controllers 512MB cache	A6262A	1	44,250	99	4,380,750	363,726
18GB 15K RPM FC HDD	A6191A, Opt. 0D1	1	914	1485	1,357,290	
16 meter Fibre Optic Cable	A3531AR	1	170	99	16,830	
HP9000 Std. Rack System E41	A4902A	1	1,910	9	17,190	
Modular Power Dist.	A5137AZ	1	145	33	4,785	
200-240 Volts	A5137AZ, Opt AW4	1	94	33	3,102	
			Subtotal		5,779,947	363,726
			Total		9,976,325	1,041,744
					Oracle Mandatory E-Business Discount on (Licenses and Support)	(161,200)
					Large Configuration Discount and Support Prepayment*	(4,691,918)
			Grand Total		5,123,207	637,845
					3-yr Cost of Ownership: \$	5,761,053
					QphH@3000GB:	27,094.3
					\$/QphH@3000GB: \$	213

Notes:

Source: 1=HP,

2=Oracle (Pricing Contact: MaryBeth Pierantoni (see Appendix G)

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

Audited By: Brad Askins 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	8.93
Start of Database Load Time	2002-08-08 09:27:14
End of Database Load Time	2002-08-08 18:15:12
Database Load Time	08:48
Query Streams for Throughput Test (S)	8
TPC-H Power	37,452.5
TPC-H Throughput	19,600.9
TPC-H Composite Query-per-Hour Metric (QphH@3000GB)	27,094.3
Total System Price Over 3 Years	\$5,761,053
TPC-H Price/Performance Metric (\$/QphH@3000GB)	\$213

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	96,975
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Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00	0808181512	08/08/2002 18:41:27	08/08/2002 21:59:15	3:17:48
Stream 01	0808181513	08/08/2002 22:00:12	08/09/2002 21:04:07	23:03:55
Stream 02	0808181514	08/08/2002 22:00:12	08/09/2002 23:47:53	25:47:41
Stream 03	0808181515	08/08/2002 22:00:12	08/09/2002 20:04:50	22:04:38
Stream 04	0808181516	08/08/2002 22:00:12	08/09/2002 20:05:56	22:05:44
Stream 05	0808181517	08/08/2002 22:00:12	08/09/2002 23:43:43	25:43:31
Stream 06	0808181518	08/08/2002 22:00:12	08/09/2002 18:52:42	20:52:30
Stream 07	0808181519	08/08/2002 22:00:12	08/09/2002 23:59:15	25:59:03
Stream 08	0808181520	08/08/2002 22:00:12	08/09/2002 23:31:01	25:30:49
Refresh		08/08/2002 23:59:15	08/09/2002 0:56:27	0:57:12



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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	1252.5	147.6	79.5	68.1	278.2	59.6	419.3	265.3	1163.4	199.7	246.0	196.0
Stream 01	3121.9	1646.1	987.3	141.2	2472.3	139.5	3567.9	1450.0	7686.3	1136.9	1633.4	1586.8
Stream 02	3156.5	1508.3	317.1	153.1	2128.9	92.3	2933.5	1415.0	8729.6	1019.9	590.1	879.8
Stream 03	6550.7	1594.3	467.1	434.3	2153.6	145.1	3420.0	2814.2	7789.8	965.7	1262.7	951.3
Stream 04	6010.5	1257.5	639.6	391.1	1273.3	143.3	3461.0	1319.5	6630.3	1072.2	1043.1	1077.5
Stream 05	6363.6	1386.8	1208.3	353.9	1126.6	119.9	2516.3	948.6	3388.5	437.7	1211.2	5015.0
Stream 06	6481.5	1599.2	911.9	333.4	2122.7	176.3	2854.4	1627.8	8540.2	529.9	1062.4	1317.1
Stream 07	6539.9	1475.5	214.2	700.3	910.0	59.5	1673.4	1660.2	5491.3	299.0	1159.3	352.0
Stream 08	6026.67	1461.81	808.19	389	2087.2	111.34	2853.7	1832.64	7976.19	1111.46	740.21	1380.51
Minimum	3121.9	1257.5	214.2	141.2	910.0	59.5	1673.4	948.6	3388.5	299.0	590.1	352.0
Average	5531.4	1491.2	694.2	362.0	1784.3	123.4	2910.0	1633.5	7029.0	821.6	1087.8	1570.0
Maximum	6550.7	1646.1	1208.3	700.3	2472.3	176.3	3567.9	2814.2	8729.6	1136.9	1633.4	5015.0

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	1057.6	72.4	117.6	322.2	575.7	2324.0	452.4	165.9	1745.8	196.5	242.6	217.8
Stream 01	5151.7	339.7	812.4	1865.8	1879.7	19900.0	2232.2	1365.4	21552.3	2366.4	209.6	210.0
Stream 02	26100.5	320.3	948.3	2531.6	4748.9	23861.9	2203.8	502.2	5925.0	2794.7	225.6	221.0
Stream 03	6242.8	352.6	997.8	1832.0	2310.9	20317.0	2165.8	831.5	13035.5	2844.1	204.1	211.6
Stream 04	5931.9	274.3	1399.8	1936.9	2000.0	23903.0	2447.8	987.9	14064.5	2280.0	226.1	214.1
Stream 05	5881.5	387.3	4667.4	1657.0	1176.0	23452.3	1946.7	558.1	25840.1	2969.0	223.7	202.9
Stream 06	5709.9	310.9	1117.2	1743.3	1927.2	17336.1	2068.5	1269.4	13922.5	2188.8	238.1	207.2
Stream 08	5884.53	281.7	937.23	1851.33	2746.18	30321.61	3953.16	1204.07	15797.41	2092.86	219.9	204.01
Stream 07	4090.2	78.1	118.7	729.9	2309.9	43239.3	792.2	1568.7	14936.5	5145.4	210.1	203.5
Minimum	4090.2	78.1	118.7	729.9	1176.0	17336.1	792.2	502.2	5925.0	2092.9	204.1	202.9
Average	8124.1	293.1	1374.9	1768.5	2387.4	25291.4	2226.3	1035.9	15634.2	2835.1	219.7	209.3
Maximum	26100.5	387.3	4667.4	2531.6	4748.9	43239.3	3953.2	1568.7	25840.1	5145.4	238.1	221.0