



# HP Integrity Superdome Enterprise Server

TPC-H Rev 2.1.0

Report Date: December 24, 2004

Total System Cost

Composite Query per Hour Metric

Price/Performance

**\$13,912,046**

**86,282.7**  
QphH@10000GB

**\$161**  
QphH@10000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

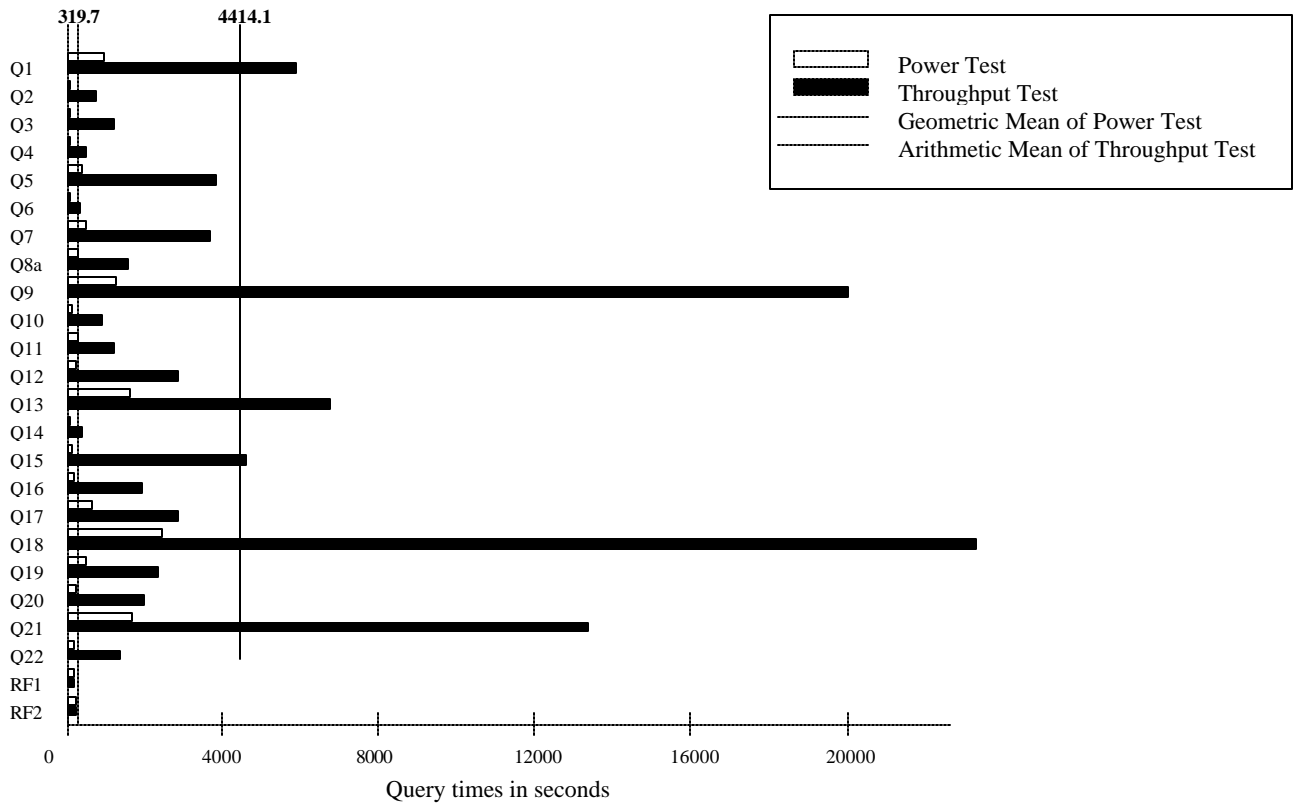
**10000 GB\***

**Oracle Database 10g Enterprise Edition with Partitioning**

**HP-UX 11.i V2 64-bit**

**None**

**April 6, 2005**



Database Load Time = 07:19:00	Load Includes Backup: N	Total Data Storage/Database Size = 10.53
RAID (Base Tables Only): N	RAID (Base Tables and Auxiliary Data Structures): N	RAID (All): Y

### System Configuration

Processors:	128 Itanium2 1.5GHz, 6MB L3 Cache
Memory:	512 GB
Disk Drives:	2 HP Surestore Disk System 2100 with 8 - 36GB 1-36GB LP 10K LVD SE U320 HDD disks and 22 HP Disk Array XP128 (with a total of 1452 73GB 10K RPM disks)
Total Disk Storage	105264GB (In this calculation one GB is defined as 1024*1024*1024 bytes)
Lan Controllers	2 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
<b>Server Hardware</b>						
Superdome left chassis	A5201A, Opt. 429	1	205,840	2	411.680	
Superdome right chassis	A5202A, Opt. 429	1	218,435	2	436.870	
IPF Superdome Cell Board (sx1000)	A6866A	1	16,000	32	512.000	
3 Year Svc & Support Price (Hardware and Software)						\$1,622,611
4GB SDRAM (4x1GB DIMMS)	A6863A	1	13,898	128	1,778.944	
PCI-x I/O chassis	A6864A	1	16,805	32	537.760	
Core I/O Card	A6865A	1	1,045	2	2.090	
CPU Itanium 2, 1.5GHz w/6MB iL3 cache (2 CPUs)	A6924A	1	38,000	64	2,432.000	
PCI 1000BT Lan Adapter	A6847A, Opt. 0D1	1	1,325	2	2.650	
HP PCI-X 2-port 4X Fabric (HCA) Adapter	AB286A	1	2,835	8	22.680	
HP 24-port 4X Fabric Copper Switch	AB399A	1	11,800	1	11.800	
HP 5m 4x Fabric Copper Cable	AB346A	1	275	4	1.100	
I/O chassis enclosure for PCI chassis	A5862A	1	25,725	8	205.800	
Graphite I/O expansion power subsystem	A5861D	1	34,860	4	139.440	
PCI 2GB Fibre Channel Adapter	A6795A	1	2,195	176	386.320	
PCI Ultra160 SCSI Adapter	A6828A	1	1,049	2	2.098	
HP Surestore Disk System 2100	A5675A	1	699	2	1.398	
1-36GB LP 10K LVD SE U320 HDD	A6571A	1	651	8	5.208	
HP Rack System/E, 41U	A4902D	1	1,910	2	3.820	
Modular Power Dist Unit for std racks	A5137AZ	1	145	2	290	
200-240 volts North America	A5137AZ	1	94	2	188	
TA5300 Enclosure for DAT tape	C7508AZ	1	1,045	2	2.090	
DDS 4 tape	C7497B	1	1,049	2	2.098	
DVD Rom drive	C7499A	1	515	2	1.030	
SCSI Terminator LVD/SE HDTS68 Multimedia	C2364A	1	100	2	200	
HP Tape Array PSU/Fan Kit	C7496A	1	319	2	638	
SCSI Cable 10m VHDTS68/DHTS68 M/M Multimid	C2363B	1	335	4	1.340	
SCSI Cable 0.5m HDTS68 M/M Multimedia	C2978B	1	99	2	198	
SX1000 Superdome SMS, rack	A9802A	1	5,140	2	10.280	
IU Rackmt Display/Keyboard/Mouse	AB243AZ	1	3,046	1	3.046	
<b>Subtotal</b>					<b>6,915,056</b>	<b>1,622,611</b>
<b>Server Software</b>						
Oracle Database 10g Enterprise Edition, Named User Plus for 3 years		2	10,000	128	1,280.000	
Real Application Clusters, Named User Plus for 3 years		2	5,000	128	640.000	
Partitioning, Named User Plus for 3 years		2	2,500	128	320.000	
Oracle Database Server Support Package for 3 years:		2	12,000	1		12,000
HPUX 11i. V2 Foundation Operating Environment	B9429AC	1	2,370	128	303.360	
HPUX Fndn OE Media	B9106AA, Opt OD1	1	199	2	398	
<b>Subtotal</b>					<b>2,543,758</b>	<b>12,000</b>
<b>Storage</b>						
HP Disk Array XP128 SSP Solution	A7875A	1	0	22	0	
XP128 Disk Control Frame	A7876A	1	55,880	22	1,229.360	
HP Proactive 24 Support Upgrade - 3 yrs		1				936,859
XP1024/128 8 Port 1-2GB/sec FC/CA CHIP Pair	A7912B	1	52,490	44	2,309.560	
XP1024/128 2GB Cache Memory Module	A7918A	1	23,170	154	3,568.180	
XP1024/128 512MB Shared Memory Module	A7921A	1	7,170	110	788.700	
XP1024/128 Array Control Processor (ACP)	A7922A	1	58,845	44	2,589.180	
XP128 Disk Path Expansion Kit	A7894A	1	19,190	22	422.180	
XP128 73GB 10k rpm, FC Array Group(4 disks)	A7929A	1	10,417	352	3,666.784	
XP128 73GB 10K rpm, FC Disk Drives	A7929S	1	2,590	44	113.960	
HP ProCurve Switch 2124	A7929S	1	279	1	279	
LUN Conf/Sec Mgr XP 1TB LTU (up to 1TB)	T1614AA	1	13,666	22	300.652	
LUN Conf/Sec Mgr XP 1TB LTU (2-6TB)	T1614AB	1	6,309	88	555.192	
Command View XP LTU	B9357AJ	1	24,690	2	49.380	
16m Fibre Channel Cables	C7525A	1	260	176	45.760	
<b>Subtotal</b>					<b>15,639,167</b>	<b>936,859</b>
<b>Total</b>					<b>25,097,981</b>	<b>2,571,470</b>
Oracle Mandatory E-Business Discount on (Licenses and Support)					(563,000)	
Large Configuration Discount and Support Preavntment*					(1,171,146)	(1,423,259)
<b>Grand Total</b>					<b>12,763,835</b>	<b>1,148,211</b>
Source: 1=HP,				<b>3-yr Cost of Ownership:</b>		<b>13,912,046</b>
2=Oracle (Pricing Contact: MaryBeth Pierantoni;				<b>QphH@10000GB:</b>		<b>86,282.7</b>
email: mary.beth.pierantoni@oracle.com; phone number: (916-315-5081)				<b>\$/QphH@10000GB: \$</b>		<b>161</b>
*All discounts are based on US list prices and for similar quantities and configurations						
<b>Audited By: Francois Raab for InfoSizing (www.sizing.com)</b>						
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	10.53
Start of Database Load Time	2004-09-17 01:11:42
End of Database Load Time	2004-09-17 08:30:08
Database Load Time	07:19:00
Query Streams for Throughput Test (S)	9
TPC-H Power	112,622.1
TPC-H Throughput	66,103.4
TPC-H Composite Query-per-Hour Metric (QpH@10000GB)	86,282.7
Total System Price Over 3 Years	\$13,912,047
TPC-H Price/Performance Metric (\$/QpH@10000GB)	\$161

## Measurement Intervals

Measurement Interval in Throughput Test (Ts)	107,831
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## Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00	917083008	9/17/04 09:01:44	9/17/04 12:34:40	3:32:56
Stream 01	917083009	9/17/04 12:34:40	9/18/04 13:49:26	25:14:46
Stream 02	917083010	9/17/04 12:34:40	9/18/04 17:20:51	28:46:11
Stream 03	917083011	9/17/04 12:34:40	9/18/04 17:05:42	28:31:02
Stream 04	917083012	9/17/04 12:34:40	9/18/04 15:11:00	26:36:20
Stream 05	917083013	9/17/04 12:34:40	9/18/04 17:05:09	28:30:29
Stream 06	917083014	9/17/04 12:34:40	9/18/04 16:51:40	28:17:00
Stream 07	917083015	9/17/04 12:34:40	9/18/04 15:06:36	26:31:56
Stream 08	917083016	9/17/04 12:34:40	9/18/04 16:27:16	27:52:36
Stream 09	917083017	9/17/04 12:34:40	9/18/04 11:00:50	22:26:10
Refresh		9/18/04 17:20:51	9/18/04 18:31:52	1:11:01



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## TPC-H Timing Intervals (in seconds)

Duration of stream execution:

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8a	Q9	Q10	Q11	Q12
Stream 00	946.4	125.4	103.6	83.2	395.0	77.8	478.5	293.0	1300.6	166.8	288.3	243.8
Stream 01	5304.6	630.6	511.9	587.8	3486.4	218.1	3810.7	2284.6	9632.5	1408.7	1280.2	1332.0
Stream 02	4582.2	503.6	1149.9	1044.0	3461.5	150.9	3060.6	1291.1	22708.8	1925.7	1767.6	1164.1
Stream 03	4965.2	551.5	146.3	1058.4	5013.7	599.9	4772.6	724.8	20232.6	2121.8	1479.4	408.6
Stream 04	4157.9	484.5	507.4	914.3	1987.7	535.9	3022.5	1764.6	20590.8	1006.4	1368.7	1977.6
Stream 05	5014.3	933.8	1230.0	585.6	4307.8	495.3	5815.6	1910.2	12171.9	1611.7	1707.3	2284.7
Stream 06	5879.0	732.3	1248.7	524.3	3856.6	375.2	3649.2	1546.7	20026.3	886.1	1248.9	2876.3
Stream 07	4125.6	519.3	1116.1	690.9	3920.3	410.5	5572.0	1956.8	18808.9	1909.0	1203.6	1715.4
Stream 08	6595.6	710.6	892.4	634.4	4200.4	328.4	5893.6	1667.5	24465.9	2058.0	765.7	1946.3
Stream 09	3893.9	730.2	1014.6	433.9	3428.3	344.7	5156.8	3395.3	8089.2	1305.4	1179.3	2392.7
Minimum	3893.9	484.5	146.3	433.9	1987.7	150.9	3022.5	724.8	8089.2	886.1	765.7	408.6
Average	4946.5	644.0	868.6	719.3	3740.3	384.3	4528.2	1837.9	17414.1	1581.4	1333.4	1788.6
Maximum	6595.6	933.8	1248.7	1058.4	5013.7	599.9	5893.6	3395.3	24465.9	2121.8	1767.6	2876.3

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	1634.2	84.6	149.8	234.7	638.0	2430.9	492.2	243.3	1657.8	220.0	222.4	263.3
Stream 01	9091.5	762.4	2730.5	2834.8	2986.8	19971.1	3587.4	1258.9	15039.4	2133.7	215.7	250.3
Stream 02	7238.7	579.2	2030.1	1933.1	4263.5	26253.7	4327.4	1746.5	10972.0	1416.8	212.0	258.6
Stream 03	7734.3	376.3	2423.2	547.2	2259.4	29172.4	1915.4	1611.6	12942.8	1603.9	221.0	255.4
Stream 04	7024.5	479.8	2117.3	1654.5	1885.7	23796.9	2424.6	1531.6	15374.3	1172.0	217.4	261.5
Stream 05	10301.0	375.3	2595.5	2934.6	2090.5	26459.1	2407.2	1637.8	13435.4	2324.4	220.1	253.7
Stream 06	6749.1	427.3	4590.5	1892.9	2889.7	23288.9	2335.0	2031.1	13383.0	1382.5	218.4	256.8
Stream 07	6731.8	737.0	3516.9	2182.9	1788.5	20956.2	3079.8	1675.0	11488.2	1410.8	221.6	254.1
Stream 08	8839.1	264.0	4430.0	3096.7	2140.6	11491.6	3096.9	1300.3	13190.0	2347.4	217.5	252.9
Stream 09	7065.8	469.4	2654.3	2332.9	2310.3	17646.1	2868.2	1737.2	10416.7	1904.3	217.6	254.7
Minimum	6731.8	264.0	2030.1	547.2	1788.5	11491.6	1915.4	1258.9	10416.7	1172.0	212.0	250.3
Average	7864.0	496.7	3009.8	2156.6	2512.8	22115.1	2893.5	1614.4	12915.8	1744.0	217.9	255.3
Maximum	10301.0	762.4	4590.5	3096.7	4263.5	29172.4	4327.4	2031.1	15374.3	2347.4	221.6	261.5