



HP Integrity Superdome Enterprise Server

TPC-H Rev 2.1.0

Report Date: July 18, 2005

Total System Cost

Composite Query per Hour Metric

Price/Performance

\$4,008,065

71,847.8
QphH@3000GB

\$56
QphH@3000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

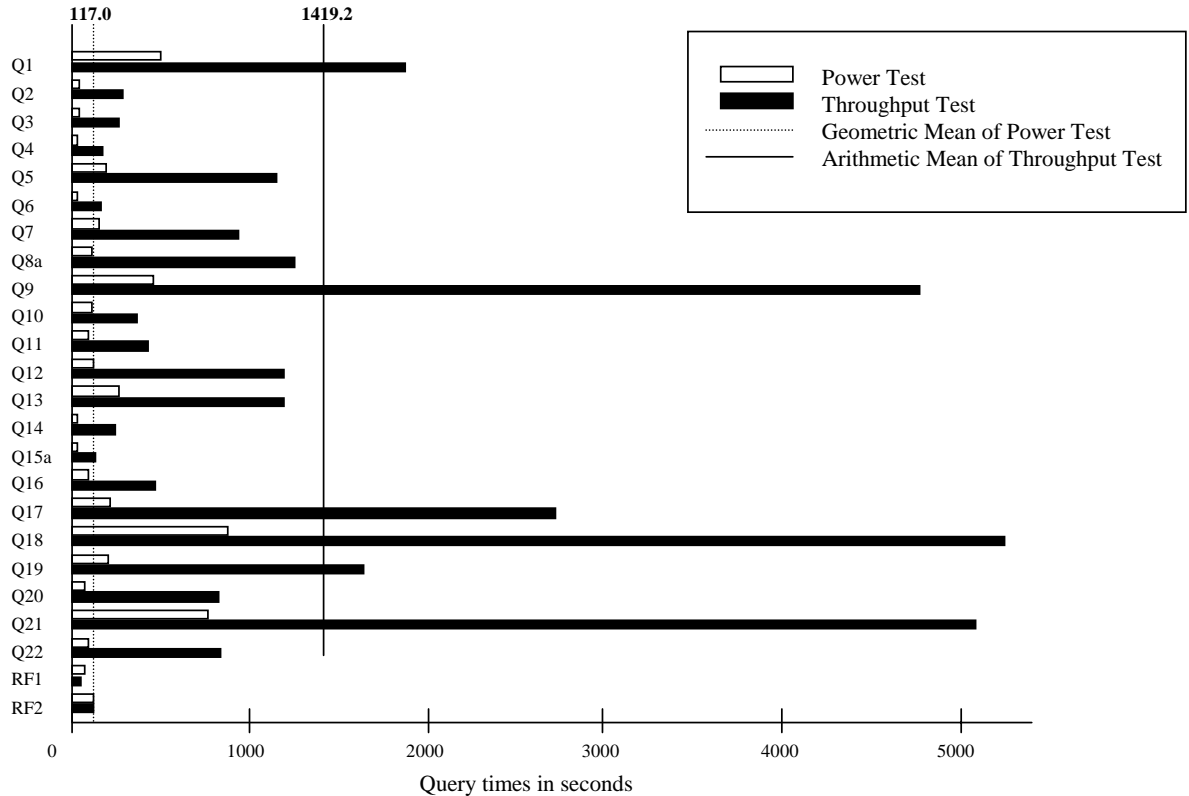
3000 GB*

**Oracle Database 10g
Release 2 Enterprise
Edition with Partitioning**

HP-UX 11.i V2 64-bit

None

January 18, 2006



Database Load Time = 03:19:00

Load Includes Backup: N

Total Data Storage/Database Size = 13.87

RAID (Base Tables Only): N

RAID (Base Tables and Auxiliary Data Structures): N

RAID (All): Y

System Configuration

Processors:

64 Itanium2 1.6GHz, 9MB L3 Cache

Memory:

256 GB

Disk Drives:

1 HP Surestore Disk System 2100 with 4 36GB disks and
96 HP StorageWorks MSA1000 (with a total of 1152 36GB 15K RPM disks)

Total Disk Storage

41616GB (In this calculation 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	A5201A, Opt. 429	1	236,716	1	236,716	
Superdome right chassis	A5202A, Opt. 429	1	251,200	1	251,200	
IPF Superdome Cell Board (sx1000)	A6866A	1	19,200	16	307,200	
3 Year Svc & Support Price (Hardware and Software)						\$837,630
4GB SDRAM (4x1GB DIMMS)	A6863A	1	13,200	64	844,800	
PCI-x I/O chassis	A6864A	1	16,805	16	268,880	
Core I/O Card	A6865A	1	1,045	1	1,045	
CPU Itanium 2, 1.6GHz w/9MB iL 3 cache (2 CPUs)	AD003A	1	41,800	32	1,337,600	
PCI 1000BT Lan Adapter	A6847A, Opt. 0D1	1	1,325	1	1,325	
I/O chassis enclosure for PCI chassis	A5862A	1	25,725	4	102,900	
Graphite I/O expansion power subsystem	A5861D	1	34,860	2	69,720	
PCI 2GB Fibre Channel Adapter	A6795A	1	2,195	96	210,720	
PCI Ultra160 SCSI Adapter	A6828A	1	1,049	1	1,049	
HP Surestore Disk System 2100	A5675A	1	995	1	995	
1-36GB LP 15K 80U4 HDD	A7527A	1	966	4	3,864	
HP Rack System/E, 41U	A4902D	1	1,910	1	1,910	
Modular Power Dist Unit for std racks	A5137AZ	1	145	1	145	
200-240 volts North America	A5137AZ	1	94	1	94	
TA5300 Enclosure for DAT tape	C7508AZ	1	1,045	1	1,045	
DDS 4 tape	C7497B	1	1,049	1	1,049	
DVD Rom drive	C7499A	1	515	1	515	
SCSI Terminator LVD/SE HDTS68 Multimedia	C2364A	1	100	1	100	
HP Tape Array PSU/Fan Kit	C7496A	1	319	1	319	
SCSI Cable 10m VHDTS68/DHTS68 M/M Multimd	C2363B	1	335	1	335	
SCSI Cable 0.5m HDTS68 M/M Multimedia	C2978B	1	99	1	99	
SX1000 Superdome SMS, rack	A9802A	1	6,500	1	6,500	
1U Rackmt Display/Keyboard/Mouse	AB243AZ	1	3,046	1	3,046	
Subtotal					3,653,171	837,630
Server Software						
Oracle Database 10g Release 2 Enterprise Edition, 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	
HPUX Fndn OE Media	B9106AA, Opt OD1	1	199	1	199	
Subtotal					951,879	6,000
Storage						
16 meter Fibre Optic Cable	221692-B22	1	82	96	7,872	
HP StorageWorks MSA1000	201723-B22	1	6,995	96	671,520	
HP MSA1000 Controller 256 Cache All	218231-B22	1	4,290	96	411,840	
3 Yr Support Price for MSA1000, MSA30, disks						241,263
36GB 15K Ultra320 Hard Drive	286776-B22	1	299	1,152	344,448	
10642 (42U) Rack Cabinet	245161-B21	1	1,359	10	13,590	
ProLiant Cluster HA/200 for MSA100	252409-B22	1	4,007	1	4,007	
Subtotal					1,453,277	241,263
Total					6,058,327	1,084,893
Oracle Mandatory E-Business Discount on (Licenses and Support)					(161,200)	
Large Configuration Discount and Support Prepayment*					(2,570,855)	(403,101)
Grand Total					3,326,272	681,793

Source: 1=HP,
2=Oracle (Pricing Contact: MaryBeth Pierantoni;
email: mary.beth.pierantoni@oracle.com; phone number: (916-315-5081)

3-yr Cost of Ownership: 4,008,065
QphH@3000GB: 71,847.8
\$/QphH@3000GB: \$ 56

*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	13.87
Start of Database Load Time	2005-06-30 23:43:32
End of Database Load Time	2005-07-01 03:01:36
Database Load Time	03:19:00
Query Streams for Throughput Test (S)	8
TPC-H Power	92,335.6
TPC-H Throughput	55,905.9
TPC-H Composite Query-per-Hour Metric (QphH@3000GB)	71,847.8
Total System Price Over 3 Years	4,008,065
TPC-H Price/Performance Metric (\$/QphH@3000GB)	\$56

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	34,000
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Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00		1-Jul-2005 14:06:58	1-Jul-2005 15:25:43	1:18:45
Stream 01	701030136	1-Jul-2005 15:25:44	2-Jul-2005 00:23:36	8:57:52
Stream 02	701030137	1-Jul-2005 15:25:44	1-Jul-2005 23:53:40	8:27:56
Stream 03	701030138	1-Jul-2005 15:25:44	1-Jul-2005 23:52:03	8:26:19
Stream 04	701030139	1-Jul-2005 15:25:44	2-Jul-2005 00:03:09	8:37:25
Stream 05	701030140	1-Jul-2005 15:25:44	2-Jul-2005 00:30:03	9:04:19
Stream 06	701030141	1-Jul-2005 15:25:44	2-Jul-2005 00:07:08	8:41:24
Stream 07	701030142	1-Jul-2005 15:25:44	2-Jul-2005 00:05:55	8:40:11
Stream 08	701030143	1-Jul-2005 15:25:44	1-Jul-2005 23:53:22	8:27:38
Refresh		2-Jul-2005 00:30:03	2-Jul-2005 00:52:24	0:22:21



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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	501.6	44.1	36.6	32.2	187.4	28.3	154.9	113.5	456.0	106.5	100.1	125.1
Stream 01	554.9	363.0	131.7	35.0	738.5	67.9	1365.0	1383.3	4025.4	751.2	603.4	1291.8
Stream 02	1707.5	272.6	215.2	141.1	938.8	110.4	1358.5	1317.0	4024.9	752.5	547.6	714.6
Stream 03	1514.3	258.4	182.3	211.9	935.9	60.6	869.4	788.0	4930.3	1378.6	633.9	1367.2
Stream 04	1872.1	370.8	86.3	163.8	453.6	126.3	980.6	1801.0	5293.4	2092.0	705.3	1038.1
Stream 05	1794.9	278.7	282.3	118.6	1019.3	45.3	827.1	1452.9	3016.8	2071.5	429.8	1256.6
Stream 06	1874.5	283.2	270.6	180.1	1150.9	166.2	940.6	1251.9	4771.0	367.6	428.8	1200.2
Stream 07	1930.2	435.0	180.4	232.1	1349.6	55.6	1150.2	1013.0	5090.0	604.3	467.8	372.9
Stream 08	1639.3	286.8	189.9	243.5	773.8	50.5	1236.7	838.4	4617.1	1500.9	779.8	1176.9
Minimum	554.9	258.4	86.3	35.0	453.6	45.3	827.1	788.0	3016.8	367.6	428.8	372.9
Average	1611.0	318.6	192.3	165.8	920.0	85.3	1091.0	1230.7	4471.1	1189.8	574.6	1052.3
Maximum	1930.2	435.0	282.3	243.5	1349.6	166.2	1365.0	1801.0	5293.4	2092.0	779.8	1367.2

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	275.6	22.9	27.6	96.7	212.9	875.1	206.2	74.2	764.8	95.1	72.5	114.8
Stream 01	1241.5	256.1	151.6	640.1	3833.6	4763.0	1785.9	1233.2	6949.9	106.1	51.2	109.9
Stream 02	1521.9	220.8	98.8	589.5	2211.4	5806.7	1371.4	982.8	5031.6	540.8	56.1	112.2
Stream 03	1322.0	127.6	223.5	745.0	2130.8	4561.8	1545.6	819.2	5018.3	754.5	54.6	112.7
Stream 04	1433.1	172.6	126.3	586.3	1133.6	5674.8	1485.4	484.5	4272.8	692.6	54.6	112.9
Stream 05	1535.4	247.7	93.6	442.9	2856.7	4936.6	1329.3	907.2	7211.7	504.9	55.3	112.7
Stream 06	1191.2	247.3	136.7	466.2	2719.7	5250.0	1640.6	821.7	5091.6	833.2	54.5	114.0
Stream 07	1502.2	37.6	52.9	158.5	1580.4	7329.9	1488.3	684.6	4743.1	752.8	54.4	114.7
Stream 08	1626.9	147.0	117.0	460.0	2365.5	4363.9	1474.9	813.8	4906.2	848.9	55.4	114.1
Minimum	1191.2	37.6	52.9	158.5	1133.6	4363.9	1329.3	484.5	4272.8	106.1	51.2	109.9
Average	1421.8	182.1	125.0	511.1	2354.0	5335.8	1515.2	843.4	5403.1	629.2	54.5	112.9
Maximum	1626.9	256.1	223.5	745.0	3833.6	7329.9	1785.9	1233.2	7211.7	848.9	56.1	114.7