



HP Integrity Superdome Enterprise Server

TPC-H Rev 2.1.0

Report Date: January 5, 2004

Total System Cost

Composite Query per Hour Metric

Price/Performance

\$5,800,675

49,104.5

\$118

QphH@10000GB

QphH@10000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

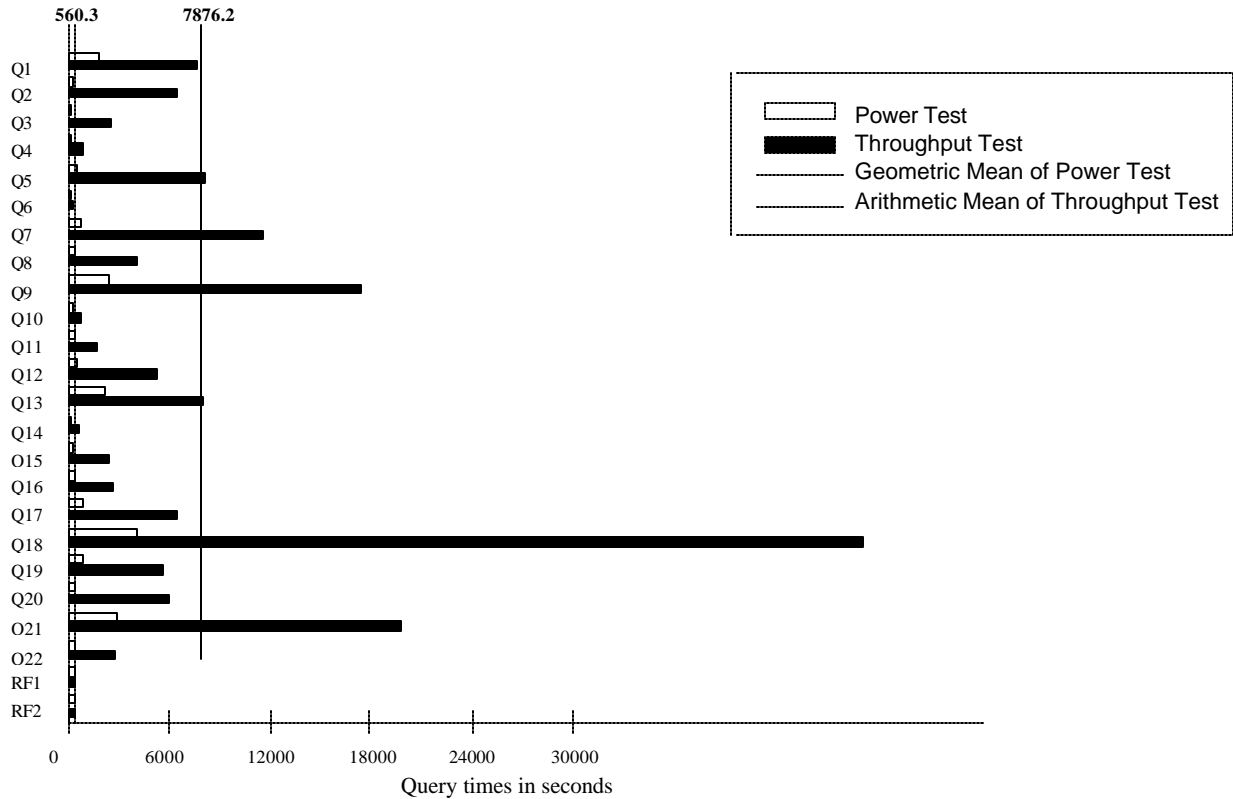
10000 GB*

Oracle 10g Database Enterprise Edition with Partitioning

HP-UX 11.i V2 64-bit

None

March 25, 2004



Database Load Time = 12:32:00	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:	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 96 HP Surestore VA7110 (with a total of 1440 73GB 15K RPM LVD disks)
Total Disk Storage	105264GB (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						
Superdome left chassis	A5201A, Opt. 429	1	205,840	1	205,840	
Superdome 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	96	215,040	
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					3,617,000	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	96	24,960	
HP Surestore VA 7110 w/ dual controller, 1024MB r	A7294A	1	25,440	96	2,442,240	
*(large quantity discount)						
3 Year Support Price						364,224
73GB 15K RPM FC HDD (10% sparing included)*	A7288A, Opt 0D1	1	1,702	1584	2,696,522	138,240
*(large quantity discount)						
HP Rack System/E, 41U, Quartz Color	A4902A	1	1,910	8	15,280	
HP Rear Door for 41U Quartz Rack	A5213AZ	1	334	8	2,672	
Modular Power Dist.	A5137AZ	1	145	32	4,640	
200-240 Volts Power Option	A5137AZ, Opt AW4	1	94	32	3,008	
Subtotal					5,189,322	502,464
Total					9,758,002	1,346,661
Oracle Mandatory E-Business Discount on (Licenses and Support)					(161,200)	
Large Configuration Discount and Support Prepayment*					(4,503,976)	(638,813)
Grand Total					5,092,827	707,848

Source: 1=HP,

2=Oracle (Pricing Contact: MaryBeth Pierantoni;

email: mary.beth.pierantoni@oracle.com; phone number: 650-506-2118)

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

3-yr Cost of Ownership: 5,800,675

QpH@10000GB: 49,104.5

\$/QpH@10000GB: \$ 118

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	10.53
Start of Database Load Time	2003-12-05 06:20:16
End of Database Load Time	2003-12-05 18:51:44
Database Load Time	12:32:00
Query Streams for Throughput Test (S)	9
TPC-H Power	64,248.7
TPC-H Throughput	37,530.0
TPC-H Composite Query-per-Hour Metric (QphH@10000GB)	49,104.5
Total System Price Over 3 Years	\$5,800,676
TPC-H Price/Performance Metric (\$/QphH@10000GB)	\$118

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	189,928
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Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00	1205185144	12/5/03 19:28:14	12/6/03 01:39:03	6:10:49
Stream 01	1205185145	12/6/03 01:41:37	12/8/03 03:01:18	49:19:41
Stream 02	1205185146	12/6/03 01:41:37	12/8/03 02:17:05	48:35:28
Stream 03	1205185147	12/6/03 01:41:37	12/8/03 01:30:59	47:49:22
Stream 04	1205185148	12/6/03 01:41:37	12/8/03 00:46:38	47:05:01
Stream 05	1205185149	12/6/03 01:41:37	12/8/03 04:16:33	50:34:56
Stream 06	1205185150	12/6/03 01:41:37	12/8/03 00:37:07	46:55:30
Stream 07	1205185151	12/6/03 01:41:37	12/8/03 01:21:21	47:39:44
Stream 08	1205185152	12/6/03 01:41:37	12/8/03 01:39:51	47:58:14
Stream 09	1205185153	12/6/03 01:41:37	12/8/03 00:55:22	47:13:45
Refresh		12/6/03 04:16:33	12/8/03 06:27:05	50:10:32



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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	1917.5	291.5	166.5	146.5	681.0	137.4	834.6	496.6	2355.8	316.0	448.7	591.4
Stream 01	1955.0	9513.2	1575.3	149.3	5898.2	404.3	9532.3	5243.2	21860.8	2009.0	1797.9	2550.9
Stream 02	9094.2	5048.9	1933.6	1409.7	7229.3	428.5	8234.3	2328.1	22918.6	2657.5	2224.5	3232.5
Stream 03	8367.6	6366.5	1419.2	1180.5	10609.0	276.7	8150.9	3502.2	20025.3	2925.5	2139.9	2982.1
Stream 04	8015.5	5394.4	1952.2	955.8	3351.0	377.1	9773.3	2357.9	24095.7	2092.4	1732.2	3463.6
Stream 05	7817.6	7359.4	1191.5	1131.2	7590.1	285.4	12179.5	3977.8	10642.8	1632.6	2032.6	3032.3
Stream 06	7815.9	6437.1	2519.0	1027.0	8148.8	242.9	11659.5	4105.1	17397.7	853.2	1755.8	5270.8
Stream 07	7739.7	4957.3	1878.8	918.6	8397.2	230.8	9470.2	2657.9	14563.7	2306.3	2551.5	1312.6
Stream 08	8101.0	5957.1	1282.6	932.4	6250.4	384.1	11660.7	2829.4	17133.7	1942.1	948.7	5035.6
Stream 09	7787.2	6770.0	1096.3	1368.5	6801.4	245.7	11403.6	4340.4	23512.2	2161.3	1873.0	6140.5
Minimum	1955.0	4957.3	1096.3	149.3	3351.0	230.8	8150.9	2328.1	10642.8	853.2	948.7	1312.6
Average	7410.4	6379.2	1719.0	963.0	7184.2	328.7	10082.6	3375.2	18579.8	2052.3	1897.9	3360.0
Maximum	9094.2	9513.2	2519.0	1409.7	10609.0	428.5	12179.5	5243.2	24095.7	2925.5	2551.5	6140.5

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	2270.6	101.6	217.5	401.8	951.2	4185.5	948.6	375.9	2996.7	452.8	553.7	409.0
Stream 01	7212.7	1321.8	1816.3	2565.1	3491.0	49691.0	5373.9	4754.6	38336.0	528.0	490.6	391.5
Stream 02	9207.5	1442.0	1712.9	4267.1	7483.0	53081.1	6627.0	1890.6	19830.2	2645.9	458.5	414.9
Stream 03	10534.3	551.6	2752.6	2810.6	5896.7	47076.6	3897.6	4432.7	23840.0	2422.4	459.2	395.4
Stream 04	10242.7	802.4	1410.8	2473.5	3809.7	56715.0	4655.5	2472.4	20902.9	2453.9	457.1	411.3
Stream 05	8253.6	1237.3	1759.2	2693.3	6276.8	52263.1	3726.9	1762.0	42105.6	3144.2	457.6	417.6
Stream 06	8012.2	720.9	2395.3	2569.5	6432.0	47291.7	5607.4	5993.1	19824.1	2850.3	499.5	404.8
Stream 07	9554.9	607.5	941.6	2164.2	3715.2	70047.4	4660.8	1511.4	18790.1	2605.7	464.5	396.1
Stream 08	9323.3	778.3	986.9	2031.1	4744.4	61322.3	8327.3	2465.6	18062.9	2193.4	453.0	412.1
Stream 09	8288.3	631.2	2492.1	1963.7	5605.7	47915.9	3887.6	3293.7	18371.4	4074.7	453.9	394.1
Minimum	7212.7	551.6	941.6	1963.7	3491.0	47076.6	3726.9	1511.4	18062.9	528.0	453.0	391.5
Average	9042.6	932.7	1722.0	2696.8	5231.1	54686.0	5359.6	3160.3	25211.5	2355.5	467.5	405.5
Maximum	10534.3	1442.0	2752.6	4267.1	7483.0	70047.4	8327.3	5993.1	42105.6	4074.7	499.5	417.6