

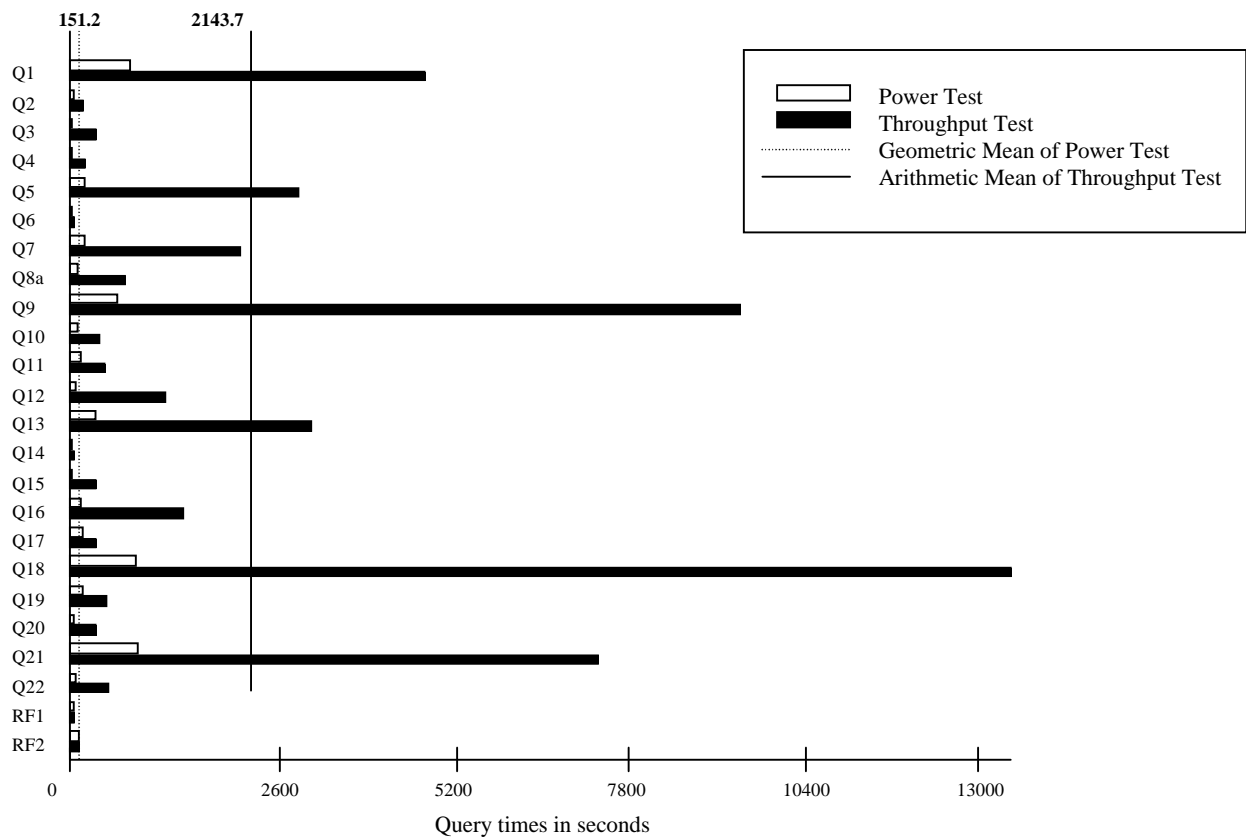


# HP Integrity Superdome - Itanium2/1.6 GHz/18MB iL3 - 64p/128c

TPC-H Rev 2.3.0

Report Date: February 27, 2007

Total System Cost	Composite Query per Hour Metric		Price/Performance	
<b>\$5,640,390 USD</b>	<b>171,380.0</b> QphH@10000GB		<b>\$32.91 USD</b> QphH@10000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date
<b>10000 GB*</b>	<b>Oracle Database 10g Release 2 Enterprise Edition with Partitioning and Oracle Automatic Storage Management</b>	<b>HP-UX 11i v3 64-bit</b>	<b>None</b>	<b>April 1, 2007</b>



Database Load Time = 05:51:44	Load Includes Backup: N	Total Data Storage/Database Size = 11.07
RAID (Base Tables Only): N	RAID (Base Tables and Auxiliary Data Structures): N	RAID (All): Y

<b>System Configuration</b>	
Processors/Cores/Threads/Type:	64/128/128 / Intel Itanium2 9040 1.6GHz, 9MB iL3 cache per core
Memory:	512 GB
Disk Drives:	1 HP Surestore Disk System 2120 with 4 36GB disks and 256 HP StorageWorks MSA1000 (with a total of 3072 36GB 15K RPM disks)
Total Disk Storage	110736GB (In this number 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
<b>Server Hardware</b>						
Superdome left chassis	A9834A, Opt 429	1	235,950	1	235,950	
Superdome right chassis	A9835A, Opt 429	1	249,950	1	249,950	
Superdome sx2000 Cell Board	A9837A	1	19,250	16	308,000	
24x7x4hr - 3 Year Svc & Support Price (Hardware and Software)						\$1,379,874
256GBBundle SDRAM (128x2GB DIMMS)	A9856A	1	720,896	2	1,441,792	
12-Slot PCI-X I/O Chassis	A9836A	1	16,950	16	271,200	
Dual-Core Intel Itanium2 9040/1.6GHz/18MB L3	AB406A	1	23,000	64	1,472,000	
PCI 1000BT Lan Adapter	A6847A, Opt. 0D1	1	1,325	1	1,325	
PCI 4GB Fibre Channel Adapter (dual port)	AB379A	1	3,995	128	511,360	
PCI Dual Channel Ultra320 SCSI Adapter	A7173A	1	795	1	795	
HPDisk System 2120	A7382A	1	1,070	1	1,070	
1-36GB LP 15K HDD	A7527A	1	966	4	3,864	
HP Universal Rack 10642 G2 Pallet Rack	AF001A	1	1,249	1	1,249	
Modular Power Dist Unit for std racks	A5137AZ	1	145	1	145	
200-240 volts North America	A5137AZ, Opt AW4	1	94	1	94	
HP Tape Array 5300 (DVD and DAT tape)	C7508B	1	729	1	729	
HP rx2620 Server (inc mem/disk/monitor/keyboard/mouse)	AB333A	1	5,315	1	5,315	
I/O Chassis Enclsoure for 12-Slot PCI-X Chassis	A9852A	1	25,750	4	103,000	
Graphite I/O expansion power subsystem	A5861D	1	34,860	2	69,720	
<b>Subtotal</b>					<b>4,677,558</b>	<b>1,379,874</b>
<b>Server Software</b>						
Oracle Database 10g Release 2 Enterprise Edition and Oracle Automatic Storage Management, 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		6,000
HPUX 11i v3 Foundation Operating Environment	B9429AC	1	2,370	128	303,360	
HP-UX 11i v3 HP9000/Integrity FOE Media	BA489AA	1	565	1	565	
<b>Subtotal</b>					<b>1,103,925</b>	<b>6,000</b>
<b>Storage</b>						
5m Fibre Channel Cables	221692-B22	1	82	256	20,992	
HP StorageWorks MSA 1000 (256 + 26 spares)	201723-B22	1	6,995	282	1,972,590	
3 Yr Support Price for MSA1000 and disks						Included
36GB 15K Ultra320 Hard Drive (3072 + 308 spares)	286776-B22	1	319	3,380	1,078,220	
HP Universal Rack 10642 G2 Pallet Rack	AF001A	1	1,249	28	35,222	
Modular Power Dist Unit for std racks	A5137AZ	1	145	113	16,356	
200-240 volts North America	A5137AZ, Opt AW4	1	94	113	10,603	
ProLiant Cluster HA/200 for MSA1000	252409-B22	1	4,007	1	4,007	
<b>Subtotal</b>					<b>3,137,990</b>	<b>0</b>
<b>Total</b>					<b>8,919,473</b>	<b>1,385,874</b>
Oracle Mandatory E-Business Discount on (Licenses and Support)					(161,200)	
47.4% Large Configuration Discount and Support Prepayment*					(3,731,027)	(772,729)
<b>Grand Total</b>					<b>5,027,246</b>	<b>613,145</b>
Source: 1=HP, 2=Oracle (Pricing Contact: Ravi Rajamani email: Ravi Rajamani, ravi.rajamani@oracle.com, 650-506-5776					<b>3-yr Cost of Ownership:</b>	<b>5,640,390</b>
					<b>QphH@1000GB:</b>	<b>171,380.0</b>
					<b>\$/QphH@1000GB:</b>	<b>32.91</b>
*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)	10000
Total Data Storage/Database Size	11.07
Start of Database Load Time	2006-11-16 14:01:06
End of Database Load Time	2006-11-16 19:52:50
Database Load Time	05:51:44
Query Streams for Throughput Test (S)	9
TPC-H Power	238,063.3
TPC-H Throughput	123,375.2
TPC-H Composite Query-per-Hour Metric (QphH@10000GB)	171,380.0
Total System Price Over 3 Years	5,640,390
TPC-H Price/Performance Metric (\$/QphH@10000GB)	\$33

**Measurement Intervals**

Measurement Interval in Throughput Test (Ts)	57,775
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**Duration of Stream Execution:**

Power Stream	Seed	RF1 Start Time RF1 End Time	Query Start Time Query End Time	RF2 Start Time RF2 End Time	Duration (sec)
	1116195250	11/17/06 13:33:55 11/17/06 13:34:58	11/17/2006 13:34:58 11/17/2006 15:17:13	11/17/2006 15:17:13 11/17/2006 15:19:52	

Throughput Stream	Seed	Query Start Time Query End Time	Duration (sec)	RF1 Start Time RF1 End Time	RF2 Start Time RF2 End Time
1	1116195251	11/17/2006 15:19:53 11/18/2006 05:56:49	52,617	11/18/2006 06:49:56 11/18/2006 06:51:00	11/18/2006 06:51:00 11/18/2006 06:53:32
2	1116195252	11/17/2006 15:19:53 11/18/2006 05:56:06	52,573	11/18/2006 06:53:32 11/18/2006 06:54:36	11/18/2006 06:54:36 11/18/2006 06:57:11
3	1116195253	11/17/2006 15:19:53 11/18/2006 06:18:09	53,897	11/18/2006 06:57:11 11/18/2006 06:58:16	11/18/2006 06:58:16 11/18/2006 07:00:48
4	1116195254	11/17/2006 15:19:53 11/18/2006 04:56:37	49,005	11/18/2006 07:00:48 11/18/2006 07:01:53	11/18/2006 07:01:53 11/18/2006 07:04:27
5	1116195255	11/17/2006 15:19:53 11/18/2006 06:49:55	55,803	11/18/2006 07:04:27 11/18/2006 07:05:34	11/18/2006 07:05:34 11/18/2006 07:08:06
6	1116195256	11/17/2006 15:19:53 11/18/2006 05:31:25	51,092	11/18/2006 07:08:06 11/18/2006 07:09:13	11/18/2006 07:09:13 11/18/2006 07:11:47
7	1116195257	11/17/2006 15:19:53 11/18/2006 06:26:43	54,411	11/18/2006 07:11:47 11/18/2006 07:12:52	11/18/2006 07:12:52 11/18/2006 07:15:27
8	1116195258	11/17/2006 15:19:53 11/18/2006 06:37:30	55,057	11/18/2006 07:15:27 11/18/2006 07:16:33	11/18/2006 07:16:33 11/18/2006 07:19:09
9	1116195259	11/17/2006 15:19:53 11/18/2006 06:17:48	53,876	11/18/2006 07:19:09 11/18/2006 07:20:15	11/18/2006 07:20:15 11/18/2006 07:22:48



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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	912.5	71.5	50.8	47.8	234.5	33.0	251.8	130.1	730.6	120.9	176.9	108.2
Stream 01	5229.7	166.6	325.1	231.8	1898.6	138.4	1974.1	666.2	7933.2	837.7	1490.7	658.9
Stream 02	4633.0	121.0	309.7	360.1	1863.6	167.6	2125.2	545.9	8968.7	1234.0	2136.5	1218.5
Stream 03	5426.2	165.7	134.3	453.2	2171.1	87.4	3168.8	934.3	7435.2	1098.9	4071.0	763.7
Stream 04	4869.8	162.7	351.3	323.7	653.8	74.3	2961.3	622.1	6914.4	885.0	3625.2	1704.2
Stream 05	5354.4	338.8	319.4	194.3	2628.4	67.3	1954.5	738.3	2787.3	737.8	3267.6	1391.9
Stream 06	4730.7	200.9	396.6	247.5	2835.9	69.2	1972.9	806.7	9435.0	448.2	535.0	1440.9
Stream 07	5003.7	128.0	292.3	193.0	2111.5	34.6	1874.4	531.3	8886.6	465.4	2883.9	218.4
Stream 08	5710.2	148.3	135.5	186.6	1973.3	45.7	1864.9	842.6	8115.8	747.2	191.1	940.8
Stream 09	5163.7	223.0	355.9	328.1	370.1	80.6	2833.0	1255.1	12365.0	1028.2	2226.7	1220.9
Minimum	4633.0	121.0	134.3	186.6	370.1	34.6	1864.9	531.3	2787.3	448.2	191.1	218.4
Average	5124.6	183.9	291.1	279.8	1834.0	85.0	2303.2	771.4	8093.5	831.4	2269.7	1062.0
Maximum	5710.2	338.8	396.6	453.2	2835.9	167.6	3168.8	1255.1	12365.0	1234.0	4071.0	1704.2

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	380.4	26.0	43.7	190.8	219.5	996.6	221.4	75.8	1013.6	97.7	63.2	159.1
Stream 01	2725.4	100.0	329.1	1521.5	781.7	11011.2	688.2	633.0	12549.5	726.2	64.0	152.7
Stream 02	2186.3	84.0	313.6	1773.7	1628.9	12512.8	558.5	781.6	8536.6	513.3	63.7	155.2
Stream 03	2674.2	75.1	317.6	1207.3	898.1	12837.5	1183.8	429.0	7894.6	469.9	64.3	152.6
Stream 04	2981.2	78.0	272.0	1387.0	464.3	12251.6	515.3	435.5	6794.9	676.9	65.0	153.1
Stream 05	3319.7	94.4	202.8	1285.1	453.6	14344.0	983.9	693.1	13969.4	676.8	67.3	152.1
Stream 06	3047.2	80.7	379.0	1710.5	393.2	13498.4	567.2	389.2	7313.6	593.6	67.1	153.5
Stream 07	3345.5	32.0	51.5	589.0	382.5	17105.1	1339.3	381.3	8059.1	502.2	65.0	155.1
Stream 08	2468.4	67.8	379.2	1393.7	1202.0	15265.0	1932.2	292.7	10669.7	484.4	65.7	156.3
Stream 09	3092.1	66.4	289.2	837.7	463.8	12627.8	1094.1	560.6	6851.3	542.0	66.1	152.2
Minimum	2186.3	32.0	51.5	589.0	382.5	11011.2	515.3	292.7	6794.9	469.9	63.7	152.1
Average	2871.1	75.4	281.5	1300.6	740.9	13494.8	984.7	510.7	9182.1	576.2	65.4	153.6
Maximum	3345.5	100.0	379.2	1773.7	1628.9	17105.1	1932.2	781.6	13969.4	726.2	67.3	156.3