



HP Integrity rx8640

TPC-H Rev 2.3.0

Report Date: August 4, 2006

Total System Cost

Composite Query per Hour Metric

Price/Performance

\$984,810**27,143.6**

QphH@1000GB

\$36

QphH@1000GB

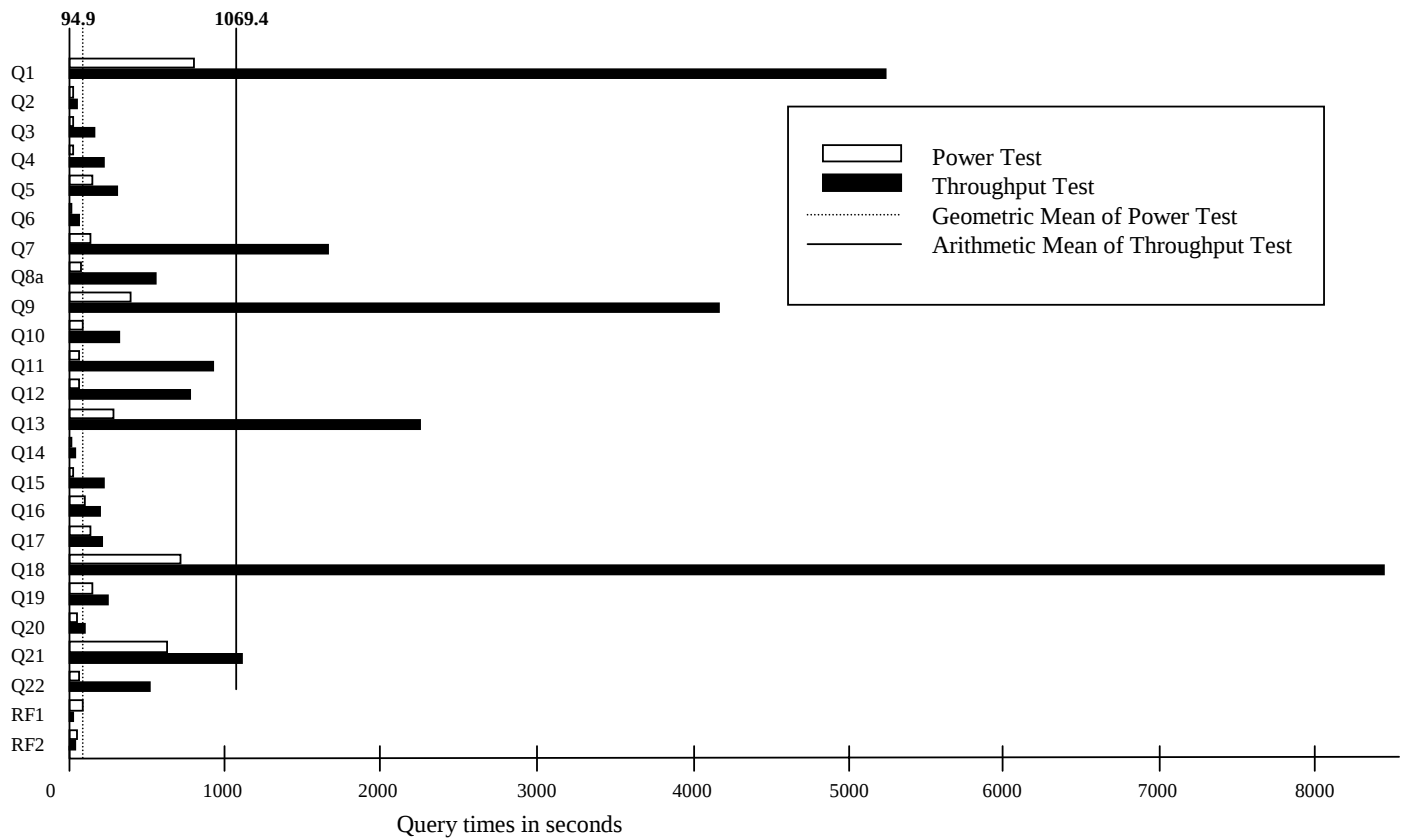
Database Size

Database Manager

Operating System

Other Software

Availability Date

1000 GB***Oracle Database 10g
Release 2 Enterprise
Edition with Partitioning****HP-UX 11.i v2 64-bit****None****January 1, 2007**

Database Load Time = 04:27:42

Load Includes Backup: N

Total Data Storage/Database Size = 17.39

RAID (Base Tables Only): N

RAID (Base Tables and Auxiliary Data Structures): N

RAID (All): Y

System Configuration

Processors:

8 Dual-core Intel Itanium2 Processors 9050 1.6GHz, 18MB

Memory:

128 GB

Disk Drives:

3 Internal disks (36GB each) disks plus
40 HP StorageWorks MSA1000 (with a total of 480 36GB 15K RPM disks)

Total Disk Storage

17388GB (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						
HP Integrity rx8640 SMP Base System with 8 1.6GHz/18MB Dual-core Processor Module	AB444A#002**	1	191,108	1	191,108	
4GB high-density DDR memory module (uses 2 DIMM)	AB454A	1	8,000	32	256,000	
HP Integrity rx8640 I/O Backplane	AD160A	1	7,700	2	15,400	
3 Year Svc & Support Price (Hardware and Software)	HA110A3-6KT**	1				\$106,561
HP Integrity rx8640 Sys. Expansion Unit	AB301A	1	35,785	1	35,785	
HP Rack kit for rx86xx Server	J1528B	1	582	1	582	
HP Rack Kit for SEU Server	J1530C	1	709	1	709	
DVD+RW Drive	AB351B	1	850	1	850	
PCI 1000 Base T Dual Port LAN Adapter Card	A7012A		1,495	1	1,495	
PCI 2GB Fibre Channel Adapter (dual port)	A6826A	1	4,395	20	87,900	
36 GB HotPlug Ultra 320 SCSI Low Profile Disk (15k)	AD146A	1	1,200	3	3,600	
HP Server Thin Client (Console)	AB300B	1	1,250	1	1,250	
Rack Model 5642	358254-B21	1	689	1	689	
Subtotal					595,368	106,561
Server Software						
Oracle Database 10g Release 2 Enterprise Edition, Named User Plus		2		8*	80,000	
Partitioning for 3 years, Named User Plus		2		8*	20,000	
Oracle Database Server Support Package for 3 years:		2		3		6,000
HPUX 11i v2 Foundation Operating Environment	B9429AC**	1	2,370	16	37,920	
HPUX Fndn OE Media	B9106AA, Opt 0D1	1	199	1	199	
Subtotal					138,119	6,000
Storage						
16 meter Fibre Optic Cable	221692-B22	1	82	40	3,280	
HP StorageWorks MSA 1000 (40+4 spares)	201723-B22	1	6,995	44	307,780	Included
36GB 15K Ultra320 Hard Drive (480 + 48 spares)	286776-B22	1	269	528	142,032	Included
10642 (42U) Rack Cabinet	245161-B21		1,359	4	5,436	
ProLiant Cluster HA/200 for MSA100	252409-B22	1	4,007	1	4,007	
Subtotal					462,535	0
Total					1,196,022	112,561
Oracle Mandatory E-Business Discount on (Licenses and Support)					(15,900)	
Large Configuration Discount and Support Prepayment*					(276,437)	(31,435)
Grand Total					903,685	81,126

Source: 1=HP,

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

*8 = 0.50 * 16. Explanation: For the purposes of counting the number of processors which require licensing, an Intel multicore chip with "n" cores shall be determined by multiplying "n" cores by a factor of 0.50.

** These components are not immediately orderable. See the FDR for more information.

A 25.6% discount was based on the overall value of the specific components from HP (Price Key) in this single quotation. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the quotation.

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.

3-yr Cost of Ownership: 984,810

QphH@1000GB: 27,143.6

\$/QphH@1000GB: \$ 36



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Measurement Results

Database Scaling (SF/size)	1000
Total Data Storage/Database Size	17.39
Start of Database Load Time	2006-07-29 22:43:01
End of Database Load Time	2006-07-30 03:10:43
Database Load Time	04:27:42
Query Streams for Throughput Test (S)	7
TPC-H Power	37,931.2
TPC-H Throughput	19,424.0
TPC-H Composite Query-per-Hour Metric (QphH@1000GB)	27,143.6
Total System Price Over 3 Years	984,810
TPC-H Price/Performance Metric (\$/QphH@1000GB)	\$36

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	28,542
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Duration of Stream Execution:

	SEED	Start Date/Time	End Date/Time	Duration
Stream 00	730031043	30-Jul-2006 12:31:26	30-Jul-2006 13:42:44	1:11:18
Stream 01	730031044	30-Jul-2006 13:42:45	30-Jul-2006 20:43:54	7:01:09
Stream 02	730031045	30-Jul-2006 13:42:46	30-Jul-2006 18:16:42	4:33:56
Stream 03	730031046	30-Jul-2006 13:42:46	30-Jul-2006 18:50:31	5:07:45
Stream 04	730031047	30-Jul-2006 13:42:46	30-Jul-2006 20:54:15	7:11:29
Stream 05	730031048	30-Jul-2006 13:42:46	30-Jul-2006 21:29:38	7:46:52
Stream 06	730031049	30-Jul-2006 13:42:46	30-Jul-2006 21:26:45	7:43:59
Stream 07	730031050	30-Jul-2006 13:42:46	30-Jul-2006 20:02:24	6:19:38
Refresh		30-Jul-2006 21:29:38	30-Jul-2006 21:38:27	0:08:49



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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	801.8	32.6	25.4	27.9	156.8	20.1	140.0	83.4	403.0	91.2	61.2	65.4
Stream 01	1765.8	45.8	162.2	75.1	2155.9	51.1	435.6	237.1	947.8	258.6	295.4	172.8
Stream 02	1653.8	109.6	68.9	83.9	450.9	44.6	259.7	539.7	3736.4	1404.7	360.6	288.0
Stream 03	2126.7	66.7	94.9	90.1	2391.6	42.8	383.7	305.4	3911.1	1359.6	722.0	213.5
Stream 04	5079.2	104.2	84.3	260.8	478.5	51.8	240.8	596.3	3983.5	1163.2	567.7	365.2
Stream 05	4144.2	63.3	168.9	440.3	289.6	72.9	1421.5	151.6	845.1	222.7	418.6	240.8
Stream 06	5233.1	47.8	166.5	229.0	319.0	67.1	1658.6	562.8	4165.8	321.9	919.4	779.9
Stream 07	6285.7	79.5	52.9	94.4	484.1	40.2	477.8	531.4	1274.0	277.7	2342.5	335.0
Minimum	1653.8	45.8	52.9	75.1	289.6	40.2	240.8	151.6	845.1	222.7	295.4	172.8
Average	3755.5	73.8	114.1	182.0	938.5	52.9	696.8	417.8	2694.8	715.5	803.8	342.2
Maximum	6285.7	109.6	168.9	440.3	2391.6	72.9	1658.6	596.3	4165.8	1404.7	2342.5	779.9

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	293.6	19.9	29.4	109.5	136.2	731.4	155.7	50.5	636.3	62.2	88.5	55.3
Stream 01	914.2	49.3	175.3	608.9	275.7	7382.9	453.1	112.5	8508.7	185.8	24.7	45.2
Stream 02	654.3	62.3	388.0	1459.6	660.5	1619.2	500.9	150.8	1779.4	160.6	24.5	45.8
Stream 03	753.4	95.9	313.9	476.1	320.8	1776.9	484.5	156.5	1802.6	576.2	25.4	45.6
Stream 04	962.9	61.1	236.2	1388.1	229.4	7994.7	461.8	71.9	1318.1	188.9	26.0	45.8
Stream 05	2016.7	65.6	301.4	905.6	180.6	7384.2	512.3	94.1	7645.0	424.8	25.7	77.2
Stream 06	2261.2	44.6	228.8	209.3	214.2	8417.9	255.0	98.9	1108.9	529.7	25.5	45.6
Stream 07	648.5	50.0	214.3	658.2	353.4	6093.3	382.2	680.3	1240.9	181.4	26.1	45.5
Minimum	648.5	44.6	175.3	209.3	180.6	1619.2	255.0	71.9	1108.9	160.6	24.5	45.2
Average	1173.0	61.2	265.4	815.1	319.2	5809.9	435.7	195.0	3343.4	321.0	25.4	50.1
Maximum	2261.2	95.9	388.0	1459.6	660.5	8417.9	512.3	680.3	8508.7	576.2	26.1	77.2