



Dell PowerEdge R710 using EXASolution 4.0

TPC-H Rev. 2.14.0

Report Date
April 5, 2011

Total System Cost

Composite Query per Hour Metric

Price / Performance

\$ 585,899

1,617,374.4
QphH@1000GB

\$ 0.37
\$ / QphH@1000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

1000 GB

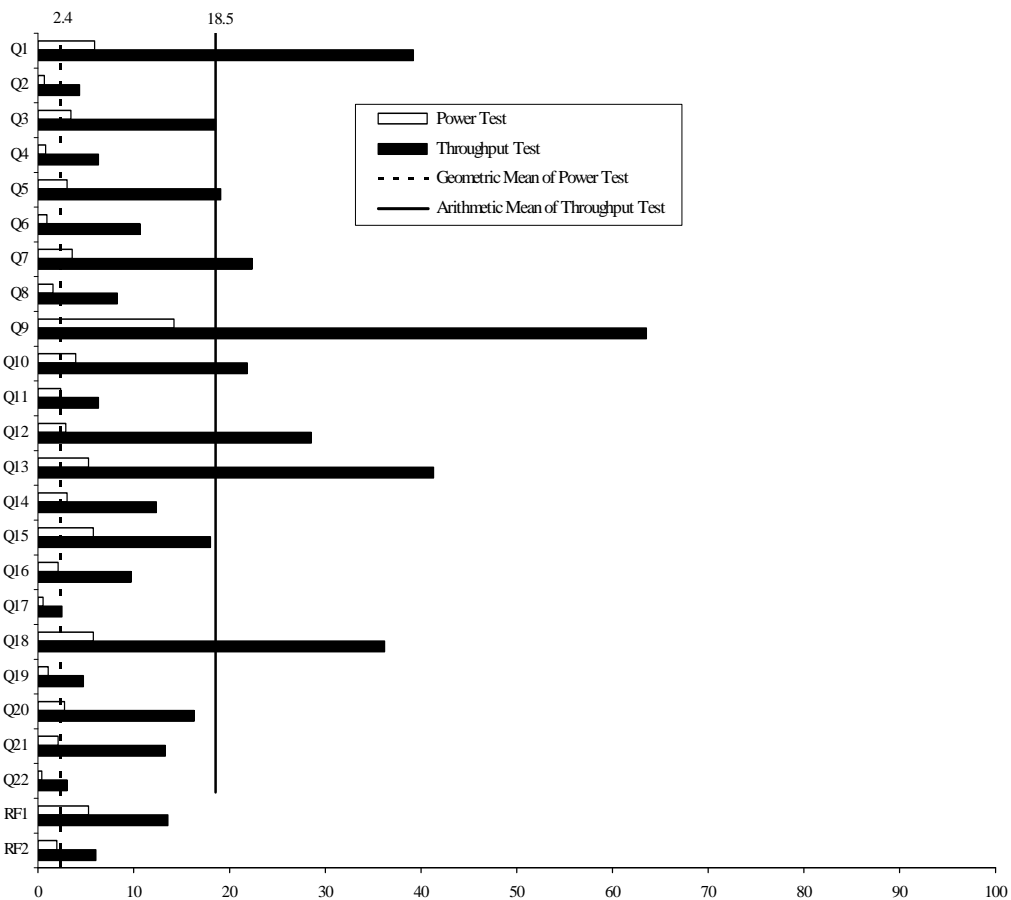
EXASolution 4.0

EXAcluster OS 4.0

C++ Compiler

October 1, 2011

Query Times in seconds



Storage Redundancy Levels:

Database Load Time = 1:04:13

Base Tables

2

Load Includes Backup: N

Auxiliary Data Structures

2

Total Data Storage / Database Size = 11.12

DBMS Temporary Space

1

Memory to Database Size Percentage = 48.0

OS and DBMS Software

1

System Configuration:

- 10 x Dell PowerEdge R710 Server, each with:
 - 2 Intel Xeon X5690 QC 3.46 GHz processors (each is 1 chip, 6 cores, 12 threads)
 - 48 GB RAM
 - 2x 600 GB (10k rpm) internal SAS disks

Total Storage: 11,176 GB (GB = 1024*1024*1024 bytes)



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Description	Part Number	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price	
Server Hardware							
R710 with Chassis for up to 8, 2.5-in. Hard Drives	210-31964	1	\$12,542.70	10	\$125,427.00	included	
Intel Xeon X5690,3.46GHz,12M,XN,6.4GT/s,6C	213-12953	1	\$0.00	10	\$0.00		
Intel Xeon X5690,3.46GHz,12M,XN,6.4GT/s,6C	374-13955	1	\$0.00	10	\$0.00		
HO Pwr Sply,Redundant,870W UPG	450-12451	1	\$0.00	10	\$0.00		
Rizer with 2 PCIe x8 +2 PCIe x4 Slots	330-10106	1	\$0.00	10	\$0.00		
48GB,12x4G,1333M,2R,RDIMM	370-19064	1	\$0.00	10	\$0.00		
iDRAC6 Enterprise	565-10114	1	\$0.00	10	\$0.00		
PERC H700 INTG RAID CTL 512MB,x8	405-11392	1	\$0.00	10	\$0.00		
HDD, 600GB 10K SAS,6G,2.5,Hot Plug	400-20817	1	\$0.00	20	\$0.00		
DVD+/-RW, SATA, INTERNAL	429-14713	1	\$0.00	10	\$0.00		
Broadcom GbE 4P LOM with TOE	541-10013	1	\$0.00	10	\$0.00		
Qlogic Infiniband Adapter QLE7340-CK	690-86219	1	\$0.00	10	\$0.00		
Sliding Ready Rack Rails with Cable Management	770-10763	1	\$0.00	10	\$0.00		
3Yr ProSupport and Next Business Day On-Site Service	710-16539	1	\$0.00	10	\$0.00		
PE 4220 42U Rack with Doors and Side Panels	210-26840	1	\$2,705.21	1	\$2,705.21		
DELL PowerConnect 5524 Switch 24 GbE Ports	210-34478	1	\$1,527.51	1	\$1,527.51		
RPS720 External Red. PSU for PC 5524 Switch	450-16399	1	\$770.87	1	\$770.87		
Dell Discount (30%)		1			-\$39,129.18		
					Subtotal	\$99,802.80	\$0.00
Storage							
No external storage required							
Software							
EXASolution 4.0 licence (1GB DB RAM*)	EXA-1G	2	\$1,560.00	380	\$592,800.00		
EXASOL Support 24x7 (4% per year)	EXA-SUP	2				\$71,136.00	
Discount (30%)		2			-\$177,840.00		
					Subtotal	\$414,960.00	\$71,136.00
					Total	\$514,762.80	\$71,136.00

3-Year Cost of Ownership \$585,899

QphH Rating: 1,617,374.4

\$/QphH@1000GB: \$0.37

Price Key: 1-Dell: Pricing may be verified by calling 1-800-BUY-DELL
contact: Ronny Lenz, ronny_lenz@dell.com
and referencing quote # 24898382.2
2-EXASOL, contact: Steffen Weissbarth, sales@exasol.com

* Memory size allocated to EXASolution (see also section 7.2)

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

Results independently audited by: Francois Raab of InfoSizing, Inc. (www.sizing.com)

Prices used in TPC benchmarks reflect the 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 that the stated prices are not available according to these terms please inform the TPC at pricing@tpc.org. Thank you.



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Numerical Quantities

Measurement Results

Database Scale Factor	1000 GB
Total Data Storage / Database Size	11.12
Start of Database Load	14:56:15
End of Database Load	16:00:33
Database Load Time	1h 04m 13 s
Query Streams for Throughput Test	9
TPC-H Power	1,500,986.4
TPC-H Throughput	1,742,787.3
TPC-H Composite Query-per-Hour Metric (QphH@1000GB)	1,617,374.4
Total System Price Over 3 Years	\$585,899
TPC-H Price/ Performance Metric (\$/QphH@1000GB)	\$0.37

Measurement Interval

Measurement Interval in Throughput Test (Ts)	409 seconds
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Duration of Stream Execution

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Duration
Stream 0	330160028	2011-03-30	16:08:46	2011-03-30	16:10:09	1m:23s
Stream 1	330160029	2011-03-30	16:10:09	2011-03-30	16:16:56	6m:47s
Stream 2	330160030	2011-03-30	16:10:09	2011-03-30	16:16:50	6m:41s
Stream 3	330160031	2011-03-30	16:10:09	2011-03-30	16:16:57	6m:48s
Stream 4	330160032	2011-03-30	16:10:09	2011-03-30	16:16:55	6m:46s
Stream 5	330160033	2011-03-30	16:10:09	2011-03-30	16:16:56	6m:47s
Stream 6	330160034	2011-03-30	16:10:09	2011-03-30	16:16:55	6m:46s
Stream 7	330160035	2011-03-30	16:10:09	2011-03-30	16:16:54	6m:45s
Stream 8	330160036	2011-03-30	16:10:09	2011-03-30	16:16:56	6m:47s
Stream 9	330160037	2011-03-30	16:10:09	2011-03-30	16:16:54	6m:45s
Refresh		2011-03-30	16:10:09	2011-03-30	16:13:36	3m:26s



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TPC-H Timing Intervals (in seconds)

Query	Power	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5	Stream 6	Stream 7	Stream 8	Stream 9	Min Q _i	Avg Q _i	Max Q _i
1	6.0	37.5	40.2	41.1	36.6	37.5	38.4	42.1	41.3	36.3	36.3	39.0	42.1
2	0.7	3.5	4.2	3.8	7.1	3.6	4.6	4.6	3.9	4.4	3.5	4.4	7.1
3	3.5	20.1	18.4	12.0	18.0	22.8	21.2	18.6	17.8	19.1	12.0	18.7	22.8
4	0.9	2.6	6.2	6.1	7.1	7.9	9.4	6.3	5.8	6.1	2.6	6.4	9.4
5	3.1	19.6	19.0	19.0	18.6	17.3	19.6	15.7	18.9	17.6	15.7	18.4	19.6
6	1.0	11.6	11.0	12.7	10.7	10.9	13.0	10.3	9.1	9.4	9.1	11.0	13.0
7	3.7	20.4	23.1	22.4	21.0	21.1	24.2	18.9	25.3	20.7	18.9	21.9	25.3
8	1.6	6.7	8.6	9.4	7.8	6.4	7.4	6.8	7.6	9.4	6.4	7.8	9.4
9	16.3	62.2	56.6	70.3	62.9	55.8	62.0	61.3	57.8	62.5	55.8	61.3	70.3
10	4.1	20.0	20.7	21.1	20.3	22.5	22.1	22.1	20.2	23.0	20.0	21.3	23.0
11	2.3	6.9	6.3	5.9	8.7	6.7	6.6	8.0	5.1	7.3	5.1	6.8	8.7
12	2.9	31.8	29.6	26.7	27.7	28.4	26.3	25.8	31.9	26.3	25.8	28.3	31.9
13	5.3	41.2	39.8	41.8	41.8	44.9	41.0	42.3	42.0	41.6	39.8	41.8	44.9
14	1.5	11.1	12.2	13.3	13.6	15.6	11.3	12.6	14.3	11.9	11.1	12.9	15.6
15	5.8	20.5	20.0	15.4	17.2	17.8	15.9	16.1	17.0	21.2	15.4	17.9	21.2
16	2.0	11.2	10.1	9.9	10.6	10.5	9.9	10.6	9.3	8.9	8.9	10.1	11.2
17	0.5	2.9	2.5	2.3	2.1	2.7	2.0	2.7	3.4	2.8	2.0	2.6	3.4
18	6.0	37.0	32.8	38.6	36.9	35.3	34.9	40.1	34.9	37.9	32.8	36.5	40.1
19	1.1	3.0	5.6	3.6	4.1	4.6	3.7	6.5	5.9	4.6	3.0	4.6	6.5
20	2.7	19.2	16.5	15.4	15.1	15.5	15.5	16.7	16.2	16.6	15.1	16.3	19.2
21	2.1	14.6	13.6	14.6	15.7	15.4	13.1	13.9	15.9	14.4	13.1	14.6	15.9
22	0.5	3.3	4.0	3.0	2.8	3.5	3.4	3.3	3.0	3.0	2.8	3.3	4.0
RF1	7.4	13.0	17.8	16.5	18.0	16.6	17.9	17.0	17.8	17.4	13.0	16.9	18.0
RF2	1.9	6.0	6.6	5.1	5.8	6.1	6.7	6.5	4.5	7.5	4.5	6.1	7.5