



## 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

**\$ 132,676**

**1,112,401.9**  
QphH@100GB

**\$ 0.12**  
\$ / QphH@100GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

**100 GB**

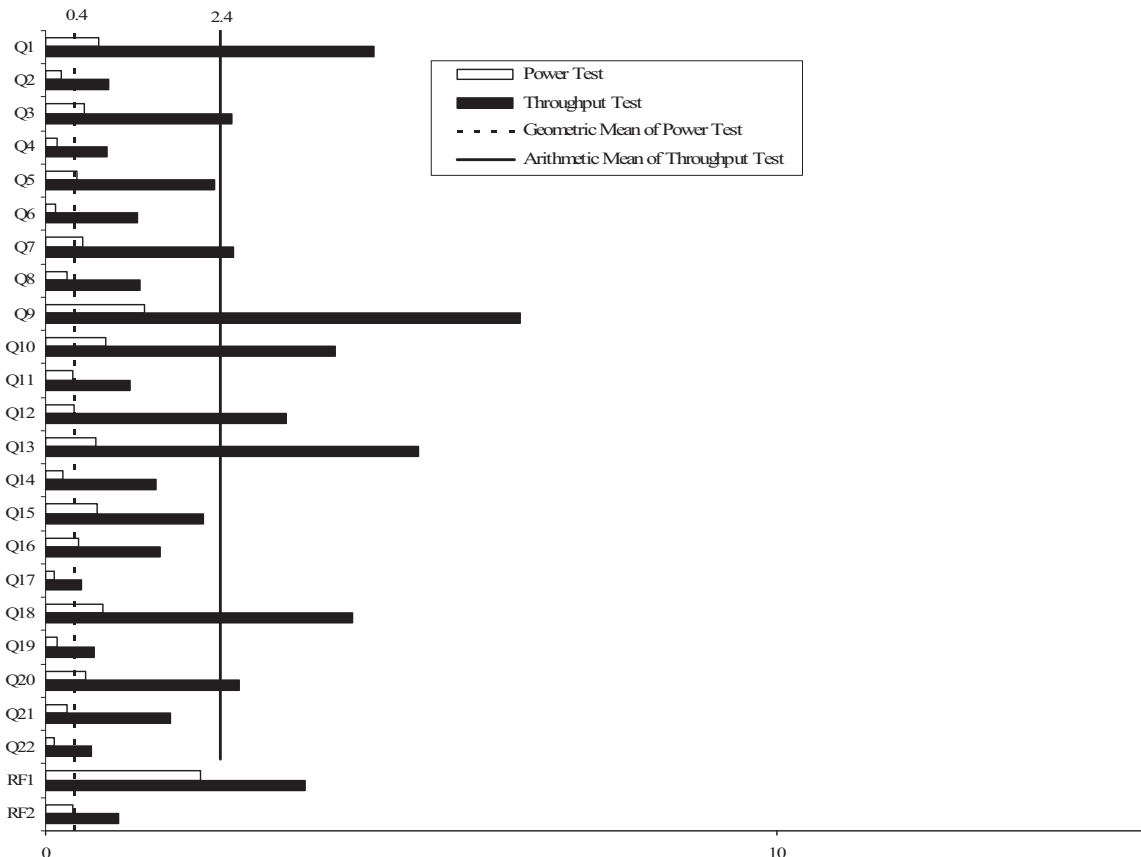
**EXASolution 4.0**

**EXAcluster OS 4.0**

**C++ Compiler**

**October 1, 2011**

Query Times in seconds



Storage Redundancy Levels:

Database Load Time = 00:08:14

Base Tables

2

Load Includes Backup: N

Auxiliary Data Structures

2

Total Data Storage / Database Size = 89.41

DBMS Temporary Space

1

Memory to Database Size Percentage = 192.0

OS and DBMS Software

1

**System Configuration:**

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

**Total Storage:** 8,941 GB (GB = 1024\*1024\*1024 bytes)



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Description	Part Number	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price	
<b>Server Hardware</b>							
R710 with Chassis for up to 8, 2.5-in. Hard Drives	210-31964	1	\$11,618.94	8	\$82,951.52	included	
Intel Xeon X5690,3.46GHz,12M,XN,6.4GT/s,8C	213-12653	1	\$0.00	8	\$0.00		
Intel Xeon X5690,3.46GHz,12M,XN,6.4GT/s,8C	374-13655	1	\$0.00	8	\$0.00		
HO Pwr Sply,Redundant,870W UPG	450-12451	1	\$0.00	8	\$0.00		
Rizer with 2 PCIe x8 +2 PCIe x4 Slots	330-10106	1	\$0.00	8	\$0.00		
24GB,6x4G,1333M,2R,RDIMM	370-19192	1	\$0.00	8	\$0.00		
iDRAC6 Enterprise	685-10114	1	\$0.00	8	\$0.00		
PERC H700 INTG RAID CTL 512MB,x8	405-11392	1	\$0.00	8	\$0.00		
HDD, 600GB 10K SAS,6G,2.5,Hot Plug	400-20817	1	\$0.00	18	\$0.00		
DVD+/-RW, SATA, INTERNAL	429-14713	1	\$0.00	8	\$0.00		
Broadcom GbE 4P LOM with TOE	541-10013	1	\$0.00	8	\$0.00		
Qlogic Infiniband Adapter QLE7340-OK	690-88219	1	\$0.00	8	\$0.00		
Sliding Ready Rack Rails with Cable Management	770-10783	1	\$0.00	8	\$0.00		
3Yr ProSupport and Next Business Day On-Site Service	710-18539	1	\$0.00	8	\$0.00		
PE 4220 42U Rack with Doors and Side Panels	210-20840	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			-\$29,386.53		
<b>PATCH CABLE CAT5E 5M GREY STP</b>							
	A2900570	1	\$4.39	18	\$70.24		
Mouse : Dell Optical USB	570-11147	1	\$9.78	1	\$9.78		
Keyboard Dell Standard Quietkey USB	580-14755	1	\$15.53	1	\$15.53		
Qlogic 12300-B518, 18-port Infiniband QDR Switch	A4897759	1	\$7,305.91	1	\$7,305.91		
Qlogic 5.0M Copper 26 AWG QSFP to QSFP Passive	A4897774	1	\$160.33	8	\$1,282.64		
DELL 17" TFT Display E1709W	855-10385	1	\$141.22	3	\$423.66		
Dell Discount (10%)		1			-\$910.78		
					<b>Subtotal</b>	<b>\$76,765.56</b>	<b>\$0.00</b>
<b>Storage</b>							
<b>No external storage required</b>							
<b>Software</b>							
EXASolution 4.0 licence (1GB DB RAM*)	EXA-1G	2	\$1,560.00	32	\$49,920.00		
EXASOL Support 24x7 (4% per year)	EXA-SUP	2				\$5,990.40	
Discount (0%)		2			\$0.00	\$0.00	
					<b>Subtotal</b>	<b>\$49,920.00</b>	<b>\$5,990.40</b>
					<b>Total</b>	<b>\$126,685.56</b>	<b>\$5,990.40</b>

**3-Year Cost of Ownership \$132,676**

**QphH Rating: 1,112,401.9**

**\$/QphH@100GB: \$0.12**

Price Key: 1-Dell: Pricing may be verified by calling 1-800-BUY-DELL  
contact: Ronny Lenz, ronny\_lenz@dell.com  
and referencing quote # 24898020.2  
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	100 GB
Total Data Storage / Database Size	89.41
Start of Database Load	06:58:27
End of Database Load	07:06:41
Database Load Time	0h 08m 14 s
Query Streams for Throughput Test	9
TPC-H Power	920,092.8
TPC-H Throughput	1,344,905.7
TPC-H Composite Query-per-Hour Metric (QpH@100GB)	1,112,401.9
Total System Price Over 3 Years	\$132,676
TPC-H Price/ Performance Metric (\$/QpH@100GB)	\$0.12

### Measurement Interval

Measurement Interval in Throughput Test (Ts)	53 seconds
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### Duration of Stream Execution

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Duration
Stream 0	329070641	2011-03-29	07:07:47	2011-03-29	07:08:00	13s
Stream 1	329070642	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 2	329070643	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 3	329070644	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 4	329070645	2011-03-29	07:08:00	2011-03-29	07:08:51	51s
Stream 5	329070646	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 6	329070647	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 7	329070648	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Stream 8	329070649	2011-03-29	07:08:00	2011-03-29	07:08:53	53s
Stream 9	329070650	2011-03-29	07:08:00	2011-03-29	07:08:52	52s
Refresh		2011-03-29	07:08:00	2011-03-29	07:08:42	42s



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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 <sub>i</sub>	Avg Q <sub>i</sub>	Max Q <sub>i</sub>
1	0.7	4.3	4.4	4.5	4.6	4.5	4.5	4.7	4.5	4.4	4.3	4.5	4.7
2	0.2	1.2	0.8	0.8	0.9	0.7	0.7	0.8	0.6	1.3	0.6	0.9	1.3
3	0.5	2.7	2.5	2.2	2.4	2.8	2.3	2.8	2.7	2.6	2.2	2.6	2.8
4	0.2	0.6	0.9	0.8	0.9	0.9	0.9	1.1	0.7	0.8	0.6	0.8	1.1
5	0.4	2.0	2.1	2.5	2.6	2.5	3.1	2.1	2.1	2.0	2.0	2.3	3.1
6	0.1	1.3	1.5	1.1	1.4	1.2	1.2	1.2	1.1	1.2	1.1	1.3	1.5
7	0.5	2.7	2.8	2.4	2.5	2.2	2.8	2.4	2.7	2.6	2.2	2.6	2.8
8	0.3	1.1	1.2	1.6	1.4	1.1	1.4	1.3	1.1	1.6	1.1	1.3	1.6
9	1.3	6.8	6.6	6.5	6.4	6.2	6.2	6.4	6.5	6.8	6.2	6.5	6.8
10	0.8	4.0	3.8	4.1	3.7	4.1	4.2	4.1	3.7	4.1	3.7	4.0	4.2
11	0.4	1.2	1.0	1.1	1.4	1.1	1.3	1.2	0.4	1.8	0.4	1.2	1.8
12	0.4	3.6	3.3	3.2	3.1	3.6	3.1	2.4	4.2	3.1	2.4	3.3	4.2
13	0.7	4.8	5.1	5.3	4.8	5.1	5.0	4.8	6.0	5.0	4.8	5.1	6.0
14	0.2	1.5	1.8	1.5	1.5	1.5	1.3	1.6	1.5	1.4	1.3	1.5	1.8
15	0.7	2.3	2.3	2.0	1.9	2.3	1.9	1.9	2.2	2.6	1.9	2.2	2.6
16	0.5	1.8	1.5	1.5	1.9	1.5	1.7	1.6	1.5	0.9	0.9	1.6	1.9
17	0.1	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6
18	0.8	3.8	4.1	4.5	3.9	4.3	4.2	5.0	3.7	4.2	3.7	4.2	5.0
19	0.2	0.4	0.5	0.5	0.6	0.4	1.4	0.6	1.1	0.6	0.4	0.7	1.4
20	0.6	2.4	2.3	2.9	2.5	2.5	2.5	3.3	2.8	2.5	2.3	2.6	3.3
21	0.3	2.0	1.6	1.7	1.9	1.8	1.2	1.7	1.8	1.8	1.2	1.7	2.0
22	0.1	0.5	0.6	0.7	0.4	0.7	0.7	0.5	0.9	0.5	0.4	0.6	0.9
RF1	2.1	3.0	3.5	3.3	3.8	4.2	3.4	3.9	3.2	3.6	3.0	3.6	4.2
RF2	0.4	1.2	0.9	1.3	1.0	1.4	1.2	0.9	0.9	1.2	0.9	1.1	1.4