



# Dell PowerEdge R820

TPC-H Rev. 2.14.0  
 TPC Pricing Rev. 1.6.0

Report Date: 1-Jun-12  
 Revised: 6-Jun-12

Total System Cost

Composite Query per Hour Metric

Price/Performance

**\$333,237 USD**

**445,529.6**  
 QphH@1,000 GB

**\$0.75 USD**  
 Price/QphH@1000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

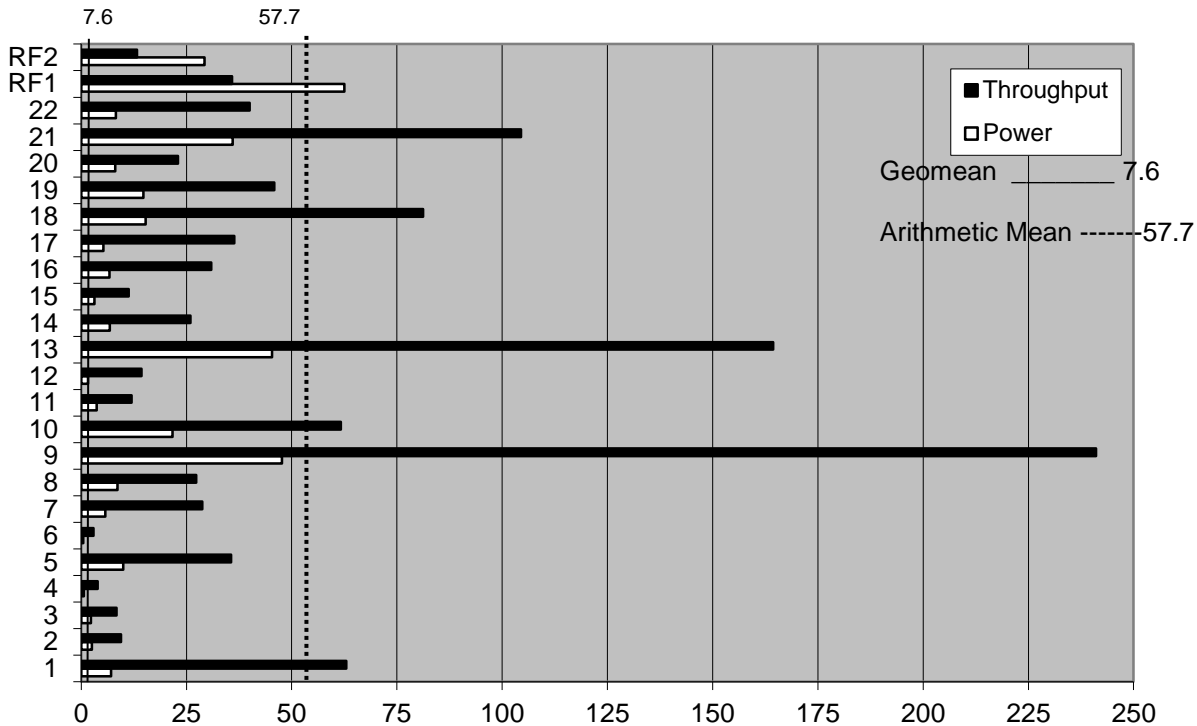
**1000 GB**

**Action  
 VectorWise 2.0.1**

**Red Hat  
 Enterprise Linux 6.1**

**n/a**

**6/1/2012**



Database Load Time = 14:26:50

### Storage Redundancy Level

Load Includes Backup: N

Base Tables and Auxiliary Data Structures

5

Total Data Storage / Database Size = 2.40

DBMS Temporary Space

5

Percentage Memory / Database Size = 77%

OS and DBMS Software

5

### System Configuration

Number of Nodes:

1

Processor/Cores/Threads/Type:

4/32/32 [Intel® Xeon® Processor E5-4650 2.70 GHz, 20M Cache per Processor](#)  
 Intel Turbo Boost Technology up to 3.30 GHz

Memory:

768 GB

Disk Controller:

[Dell™ PowerEdge™ RAID Controller \(PERC\)](#) H710 Adapter with 512MB NVRAM

Disk Drives:

8 x 300GB Internal 15K RPM SAS 6G Disks

Total Disk Storage:

2,400GB

LAN Controllers:

[Intel Ethernet i350 QP 1Gb Network Daughter Card](#)



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Description	Part Number	Pricing Source	Unit Price	Qty	Extended Price	3 yr. Maint. Price
<b>Server Hardware</b>						
PowerEdge R820	225-2607	1	\$2,795.00	1	\$2,795.00	
2.5" Chassis w/ up to 16 Hard Drives	331-6543	1	\$1,500.00	1	\$1,500.00	
PowerEdge R820 Shipping	331-6156	1	\$0.00	1	\$0.00	
1333MHz RDIMMs	331-4422	1	\$0.00	1	\$0.00	
Performance Optimized	331-4428	1	\$0.00	1	\$0.00	
PERC H710 ADPT RAID Cont, 512MB NV, FH	342-4048	1	\$499.00	1	\$499.00	
VFlash,8GB SD Card,iDRAC Ent	342-1413	1	\$49.00	1	\$49.00	
iDRAC7 Enterprise	421-5339	1	\$399.00	1	\$399.00	
Intel Ethernet I350 QP 1Gb Network Daughter Card	430-4447	1	\$159.00	1	\$159.00	
POWER CORD, 10F, NEMA5-15P-C13	310-8509	1	\$0.00	2	\$0.00	
Power Saving Dell Active Power Controller	330-5116	1	\$0.00	1	\$0.00	
RdyRI Slidng RI,CMA	331-4433	1	\$189.00	1	\$189.00	
Bezel	318-1375	1	\$49.00	1	\$49.00	
DVD+-RW, SATA	313-9090	1	\$99.00	1	\$99.00	
EDOCS for R820	331-6872	1	\$0.00	1	\$0.00	
2x E5-4650 2.70,20M,8.0GT,Turbo,8,130W	317-9329	1	\$10,418.00	1	\$10,418.00	
Heat Sink for PowerEdge R820	331-6161	1	\$0.00	1	\$0.00	
HDD, 300GB 15K SAS,6G,2.5,HP	342-2240	1	\$679.00	8	\$5,432.00	
RAID 5, H710p, H710, H310	331-5686	1	\$0.00	1	\$0.00	
RHEL6.1,Flx64,No Lic or Media	421-7141	1	\$0.00	1	\$0.00	
RHEL6.1 Media Only X86_64, No Sub,Fl	421-5737	1	\$0.00	1	\$0.00	
RHEL_4 Socket,1yr Sub and Lic,1VT Guest	421-5727	1	\$2,520.00	1	\$2,520.00	
DIMM Blanks for Systems up to 4 Procs	317-9332	1	\$0.00	1	\$0.00	
Upgrade to Four E5-4650 2.70,20M,130W	317-9337	1	\$10,418.00	1	\$10,418.00	
Heat Sink for PowerEdge R820	331-6161	1	\$0.00	1	\$0.00	
PWA for PowerEdge R820	331-6162	1	\$529.00	1	\$529.00	
16GB RDIMM 1333MHz,LV,DR,x4	319-0111	1	\$399.00	48	\$19,152.00	
Dual Non-Redundant PS, 1100W (2+0)	331-7307	1	\$490.00	1	\$490.00	
ONSITE INSTL DECLINED	900-9997	1	\$0.00	1		\$0.00
MAINTENANCE DECLINED	926-2979	1	\$0.00	1		\$0.00
PSMC 4H7X24 OS,PE R820,UNY,INIT	989-6461	1	\$156.00	1		\$156.00
HW WRTY + SVC,PE R820,UNY,INIT	936-1997	1	\$82.00	1		\$82.00
INFO,PS TECH SPT CONTACT,ENTERPRISE	989-3439	1	\$0.00	1		\$0.00
HW WRTY + SVC,PE R820,UNY,2YR EXT	939-4938	1	\$118.00	1		\$118.00
PSMC TECH SPT,PE R820,3 YR	937-0523	1	\$1,432.00	1		\$1,432.00
PSMC 4H7X24 OS,PE R820,UNY,2YR EXT	937-0483	1	\$894.00	1		\$894.00
PSMC MISSION CRIT SVC,PE R820,3YR	939-4958	1	\$817.00	1		\$817.00
<i>Dell Discount (30%)</i>		1		1	-\$16,409.10	-\$1,049.70
				<b>Subtotal</b>	<b>\$38,287.90</b>	<b>\$2,449.30</b>
<b>No external storage</b>					\$40,737.20	
<b>Software</b>						
VectorWise 2.0 3-year license Dell server**	ING-VW-3Y-GB-DELL	2	\$250.00	1,000	\$250,000.00	
VectorWise 1-year maintenance bug fixes**	ING-VW-3Y-GB-DELL-MNT	2	\$25.00	3,000		\$75,000.00
VectorWise discount	10%	2			-\$25,000.00	-\$7,500.00
				<b>Subtotal</b>	<b>\$225,000.00</b>	<b>\$67,500.00</b>
				<b>Total</b>	<b>\$263,287.90</b>	<b>\$69,949.30</b>
Price Key: 1-Dell: Pricing may be verified by calling 1-800-BUY-DELL contact: Gregory Olsen, Greg_Olsen@dell.com and referencing quote # 621877954 2-Actian Pricing may be verified by calling 1-650-587-5500 contact: Mark Van de Wiel, mark.vandewiel@Actian.com All discounts are based on list prices and for similar quantities and configurations.				<b>Cost of Ownership: \$333,237 USD</b>		
				<b>QphH@1,000GB: 445,529.6</b>		
				<b>\$/QphH@1,000GB: \$0.75 USD</b>		
<b>Audited by: Lorna Livingtree for Performance Metrics, Inc.</b>						
<i>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 from their respective vendors. For complete details, see the pricing sections of the TPC benchmark specifications.</i>						
<i>If you find that the stated prices are not available according to these items, please inform the TPC at pricing@tpc.org. Thank you.</i>						



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## Measurement Results

Database Scaling (SF/Size)	1,000 GB
Total Data Storage/Database Size	2.40
Percentage Memory/Database Size	77%
Start of Database Load Time	5/24/12 13:23:11
End of Database Load Time	5/25/12 3:50:01
Database Load Time	14:26:50
Query Streams for Throughput Test (S)	7
TPC-H Power @1,000 GB	475,833.4
TPC-H Throughput @1,000 GB	417,155.8
TPC-H Composite @1,000 GB	445,529.6
Total System Price Over 3 Years	\$333,237
TPC-H Price/Performance Metrics (\$/QpH@1,000 GB)	\$0.75

## Measurement Interval in Throughput Test (Ts)

1,329

Power Run	Seed	Query Start Time Query End Time	Duration(sec)	RF1 Start Time RF1 End Time	RF 2 Start Time RF 2 End Time
	525035001	5/25/2012 05:34:56 5/25/2012 05:39:17		261.5	5/25/2012 05:33:53 5/25/2012 05:34:56
Throughput Streams	Seed	Query Start Time Query End Time	Duration(sec)	RF1 Start Time RF1 End Time	RF 2 Start Time RF 2 End Time
1	525035002	5/25/2012 05:39:48 5/25/2012 05:59:55		1207.9	5/25/2012 05:39:48 5/25/2012 05:42:07
2	525035003	5/25/2012 05:39:48 5/25/2012 06:01:56	1328.8	5/25/2012 05:42:58 5/25/2012 05:44:50	5/25/2012 05:44:51 5/25/2012 05:45:40
3	525035004	5/25/2012 05:39:48 5/25/2012 06:01:32	1304.1	5/25/2012 05:45:40 5/25/2012 05:47:17	5/25/2012 05:47:17 5/25/2012 05:48:15
4	525035005	5/25/2012 05:39:48 5/25/2012 06:01:48	1320.8	5/25/2012 05:48:15 5/25/2012 05:49:57	5/25/2012 05:49:57 5/25/2012 05:50:50
5	525035006	5/25/2012 05:39:48 5/25/2012 05:58:37	1129.1	5/25/2012 05:50:50 5/25/2012 05:52:33	5/25/2012 05:52:33 5/25/2012 05:53:24
6	525035007	5/25/2012 05:39:48 5/25/2012 06:01:42	1314.9	5/25/2012 05:53:24 5/25/2012 05:56:49	5/25/2012 05:56:49 5/25/2012 05:58:10
7	525035008	5/25/2012 05:39:48 5/25/2012 06:01:08	1280.8	5/25/2012 05:58:10 5/25/2012 05:59:56	5/25/2012 05:59:56 5/25/2012 06:00:55



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Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
0	7.1	2.5	2.3	0.6	10.0	0.5	5.7	8.6	47.7	21.7	3.7	1.6
1	85.6	8.1	5.8	2.0	45.3	4.3	34.3	41.8	306.0	59.7	17.8	27.9
2	43.0	9.6	33.5	2.4	28.1	0.7	48.4	31.9	367.7	49.1	19.9	3.9
3	33.3	7.8	3.7	3.7	60.4	4.6	46.8	29.2	322.2	60.8	27.8	4.8
4	46.7	31.5	3.0	2.9	38.6	3.0	16.3	20.3	282.0	70.5	11.9	14.0
5	59.4	8.5	6.0	3.7	47.6	3.4	46.9	32.7	109.9	181.5	12.7	31.7
6	174.5	8.4	6.6	3.5	23.3	3.7	39.1	26.3	349.9	72.1	11.4	12.9
7	58.4	6.7	10.3	4.2	81.6	3.3	21.2	42.7	267.7	82.9	9.1	7.6
Minimum	7.1	2.5	2.3	0.6	10.0	0.5	5.7	8.6	47.7	21.7	3.7	1.6
Maximum	174.5	31.5	33.5	4.2	81.6	4.6	48.4	42.7	367.7	181.5	27.8	31.7
Average	63.5	10.4	8.9	2.9	41.9	2.9	32.3	29.2	256.6	74.8	14.3	13.1
Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
0	45.3	6.8	3.1	6.7	5.3	15.3	14.8	8.1	36.0	8.2	62.5	29.3
1	170.4	13.5	9.0	21.3	24.2	81.5	46.2	39.9	70.0	93.3	139.9	51.0
2	204.8	51.1	17.7	51.1	36.6	82.0	50.6	24.3	102.9	69.7	112.0	49.1
3	217.6	33.5	18.1	20.3	45.4	87.0	38.2	31.5	162.5	44.9	97.2	58.0
4	210.8	26.1	8.0	39.0	52.6	185.6	70.9	9.7	163.3	14.1	102.1	52.6
5	226.3	21.6	12.3	22.8	21.8	93.8	55.2	20.3	71.9	38.9	103.2	51.2
6	203.0	39.8	17.8	61.6	34.8	67.3	53.5	26.5	47.5	31.3	205.2	80.6
7	170.0	36.8	5.5	21.6	93.1	95.6	57.1	26.0	134.0	45.4	106.3	58.8
Minimum	45.3	6.8	3.1	6.7	5.3	15.3	14.8	8.1	36.0	8.2	62.5	29.3
Maximum	226.3	51.1	18.1	61.6	93.1	185.6	70.9	39.9	163.3	93.3	205.2	80.6
Average	181.0	28.7	11.4	30.6	39.2	88.5	48.3	23.3	98.5	43.2	116.1	53.8