



**DELL  
PowerEdge 6950  
with SQL Server 2005  
Enterprise x64 Edition™**

**TPC-H Revision 2.3.0**

Report Date: Oct 23, 2006

Revision Date: May 17, 2007

**Total System Cost  
\$84,387 USD**

**TPC-H Composite Query per  
Hour  
14,923.1 QphH@100GB**

**Price/Performance  
\$5.66 USD/ QphH@100GB**

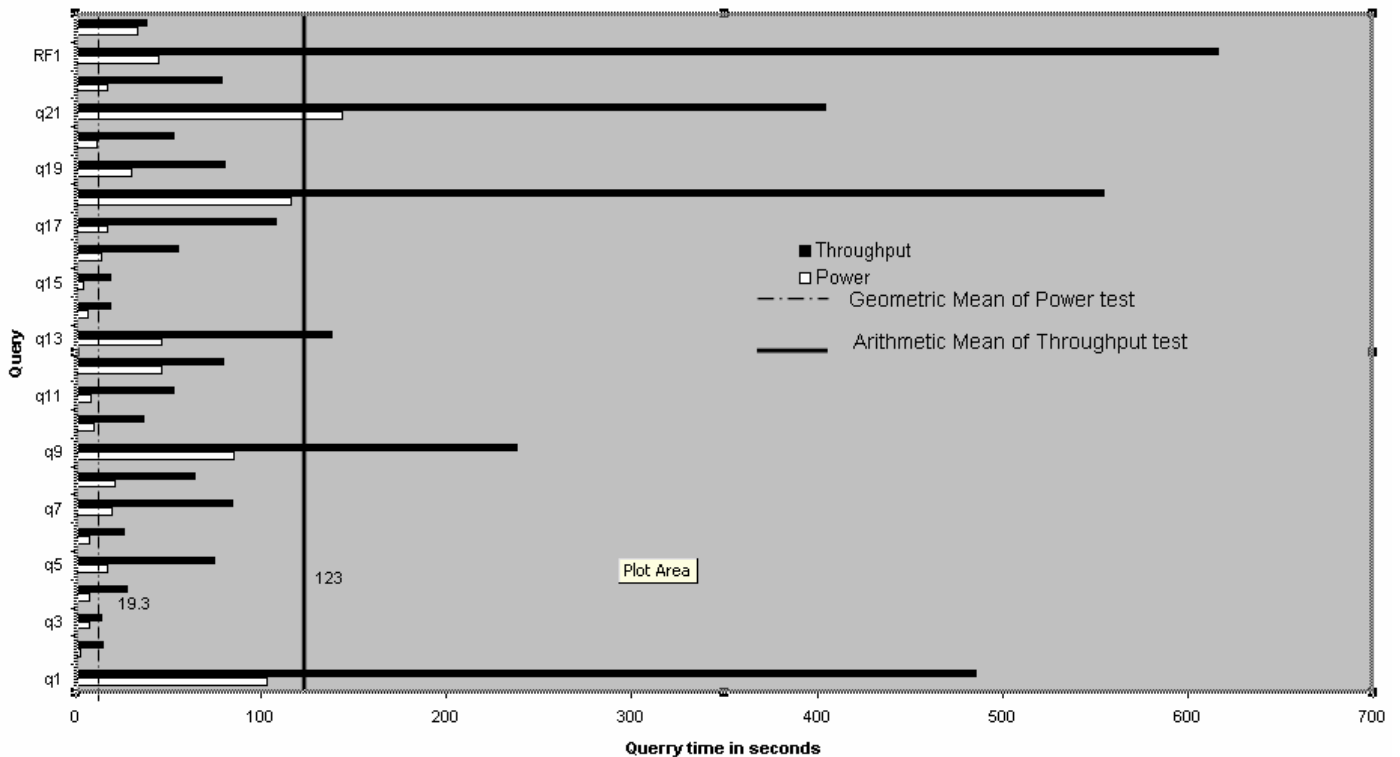
**Database Size  
100GB**

**Database Manager  
SQL Server 2005 Enterprise x64  
Edition™**

**Operating System  
Microsoft Windows Server  
2003 Enterprise x64  
Edition™**

**Other Software**  
Visual C++ Standard Edition  
Visual Basic 2003 .Net  
Professional

**Availability Date  
Dec 4, 2006**



**Database Load Time**  
1:03:04

**Total Disk/Database Size**  
37.77

**Load Includes Backup**  
Y

**RAID (Base tables only)**  
N

**RAID (Base tables and auxiliary data  
structures)**  
N

**RAID (Everything)**  
N

**System Configuration :** 1 node  
**Processors (per node) :** 4x AMD Opteron 8220SE DC - 2.8 GHz w/ 2M Cache  
**Memory: (per node) :** 32GB RAM  
**Disk Drives:** 105 – 36GB 15k SAS HDD & 4 – 73GB 10k SAS HDD

“Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.)”

Dell		PowerEdge PE6950			TPC-H REV 2.3 EXECUTIVE SUMMARY		
		Server			Report Date: 23-Oct-06		
					Revision Date: 17-May-07		
Description	Part Number	Third Party		Unit Price	Qty	Extended Price	3 yr. Maint. Price
<b>Server Hardware</b>		Brand	Pricing				
PE6950,DUAL 8220SE,2X1MB,2.8GZ & 2 Broadcom NICs	222-5737		NIO	\$6,369.00	1	\$6,369.00	\$320.00
QUAD OPTERON 8220SE PROCESSORS	311-6612		NIO	\$3,499.00	1	\$3,499.00	
32GB, DDR2, 667MHZ (16X2GB), 2R	311-6600			\$5,498.00	1	\$5,498.00	
1.44MB,3.5IN,USB,EXT FDD	341-2530			\$39.00	1	\$39.00	
24X CD-ROM, INTERNAL	313-2700			\$30.00	1	\$30.00	
PERC5/i,Integrated	341-3018			\$299.00	1	\$299.00	
PERC5/E SAS RAID, 2X4 EXTERNAL	341-3023			\$799.00	7	\$5,593.00	
73GB,SAS,3.5IN,10K,PE	341-3029			\$299.00	4	\$1,196.00	
E773s 17-inch Color CRT Monitor	320-5091			\$199.00	1	\$199.00	
					<b>Subtotal</b>	\$22,722.00	\$320.00
<b>PowerVault Disk Subsystem</b>							
PV MD1000,RACK,3U,15 BAY,LBZL	222-2299			\$2,680.00	7	\$18,760.00	\$11,536.00
SINGLE ENCL MGT MODULES, SAS/SATA	420-5927			\$345.83	7	\$2,420.81	
36GB,30GBPS,SAS,3.5IN,15K	341-2816			\$249.00	105	\$26,145.00	
RACK-111/24U/Dell	A0213544			\$479.95	1	\$479.95	
					<b>Subtotal</b>	\$47,805.76	\$11,536.00
<b>Server Software</b>							
SQL Server 2005 Enterprise x64 Edition **	810-04793	Microsoft	1	\$8,487.00	1	\$8,487.00	
SQL Server 2005 Client Licence **	359-01911	Microsoft	1	156	25	\$3,900.00	
Windows Server 2003 Enterprise x64 Server **	P72-00274	Microsoft	1	\$2,334.00	1	\$2,334.00	
Visual C++ Standard Edition **	254-00170	Microsoft	1	\$109.00	1	\$109.00	
Visual Basic 2003 .Net Professional	046-00856	Microsoft	1	\$109.00	1	\$109.00	
Professional Support (1 Incident)		Microsoft	1	\$245.00	1		\$245.00
					<b>Subtotal</b>	\$14,939.00	\$245.00
All components from Dell are discounted 16% based on total dollar volume of this configuration.				<b>Other Discounts (16%)</b>		\$13,181.40	
					<b>Total</b>	<b>\$72,285</b>	<b>\$12,101</b>
Notes: * Maint. included in PowerVault MD1000 disk pod					<b>Three-Year Cost of Ownership:</b>		<b>\$84,387 USD</b>
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server					<b>QphH@100G</b>		<b>14,923.1</b>
Pricing: NIO = These components are Not Immediately Orderable; 1 = Microsoft, all others are Dell							
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 362550038 as a complex quote.							
<b>Audited by Lorna Livingtree, Performance Metrics Inc.</b>					<b>\$ / QphH@100G:</b>		<b>\$5.66 USD</b>
<p>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 items, please inform the TPC at <a href="mailto:pricing@tpc.org">pricing@tpc.org</a>.</p>							



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**w/ SQL Server 2005**  
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## Numerical Quantities Summary

### Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	37.77
Start of Database Load	2006-10-10 10:19:24
End of Database Load	2006-10-10 11:22:41
Database Load Time	1:03:04
Query Streams for Throughput Test	5
TPC-H Power	18,606.0
TPC-H Throughput	11,969.2
TPC-H Composite Query-per-Hour Metric (QpH@100GB)	14,923.1
Total System Price Over 3 Years	\$84,387
TPC-H Price Performance Metric (\$/QpH@100GB)	\$5.66

### Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 3,308.5 seconds

### Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
<b>Stream00</b>	1010112241	10/10/06 13:06:54	10/10/06 13:19:09	0:12:15
<b>Stream01</b>	1010112242	10/10/06 13:19:46	10/10/06 14:01:45	0:41:59
<b>Stream02</b>	1010112243	10/10/06 13:19:46	10/10/06 14:06:48	0:47:02
<b>Stream03</b>	1010112244	10/10/06 13:19:46	10/10/06 14:05:37	0:45:51
<b>Stream04</b>	1010112245	10/10/06 13:19:46	10/10/06 14:03:45	0:43:59
<b>Stream05</b>	1010112246	10/10/06 13:19:46	10/10/06 14:06:28	0:46:42
<b>Refresh00</b>		10/10/06 13:06:09	10/10/06 13:06:53	0:00:44
		10/10/06 13:19:10	10/10/06 13:19:44	0:00:33
<b>Refresh01</b>		10/10/06 13:19:46	10/10/06 14:08:16	0:48:31
<b>Refresh02</b>		10/10/06 14:08:23	10/10/06 14:09:58	0:01:36
<b>Refresh03</b>		10/10/06 14:10:04	10/10/06 14:11:39	0:01:35
<b>Refresh04</b>		10/10/06 14:11:45	10/10/06 14:13:17	0:01:32
<b>Refresh05</b>		10/10/06 14:13:22	10/10/06 14:14:54	0:01:32



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### Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	103.3	2.6	7.0	7.7	16.9	7.2	19.5	21.3
Stream01	371.0	13.3	17.4	13.8	81.2	26.2	93.8	43.4
Stream02	525.6	16.5	11.2	19.8	59.3	54.8	71.0	73.8
Stream03	505.4	13.9	14.5	55.2	58.5	17.6	74.5	96.2
Stream04	523.2	16.1	10.3	22.1	81.9	16.4	109.9	61.2
Stream05	504.5	12.5	14.6	25.3	92.7	15.0	73.9	47.8
Min Qi	371.0	12.5	10.3	13.8	58.5	15.0	71.0	43.4
Max Qi	525.6	16.5	17.4	55.2	92.7	54.8	109.9	96.2
Avg Qi	485.9	14.5	13.6	27.2	74.7	26.0	84.6	64.5

Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	85.3	9.8	7.9	46.3	41.2	6.1	4.1	14.0
Stream01	220.7	46.6	29.4	63.0	139.3	17.4	27.3	51.4
Stream02	246.2	34.7	57.8	59.2	136.0	23.6	16.2	52.3
Stream03	278.1	53.2	30.9	50.2	76.0	20.0	18.5	42.6
Stream04	264.6	29.3	31.1	75.7	117.2	15.6	18.3	66.8
Stream05	181.5	19.7	112.7	151.7	222.9	17.3	8.1	61.1
Min Qi	181.5	19.7	29.4	50.2	76.0	15.6	8.1	42.6
Max Qi	278.1	53.2	112.7	151.7	222.9	23.6	27.3	66.8
Avg Qi	238.2	36.7	52.4	80.0	138.3	18.8	17.7	54.8

Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	17.0	116.1	30.1	11.1	143.7	16.7	44.3	33.5
Stream01	26.4	619.4	63.2	39.3	459.1	56.9	2871.7	35.2
Stream02	214.2	540.2	117.3	87.8	306.5	98.3	54.7	38.4
Stream03	225.6	503.3	73.6	37.8	404.0	101.1	56.5	36.6
Stream04	28.9	536.0	86.9	40.0	407.2	80.0	48.5	39.8
Stream05	45.4	573.6	60.6	59.1	443.8	58.3	49.1	40.3
Min Qi	26.4	503.3	60.6	37.8	306.5	56.9	48.5	35.2
Max Qi	225.6	619.4	117.3	87.8	459.1	101.1	2871.7	40.3
Avg Qi	108.1	554.5	80.3	52.8	404.1	78.9	616.1	38.1