



**PowerEdge 6650/2.0GHz Using
Microsoft Windows 2003
Server Enterprise Edition and
SQL Server 2000 SP3 EE**

TPC-H Revision 2.0

**Report Date:
April 28, 2003**

**Total System Cost
\$89,748**

**TPC-H Composite Query per Hour
1984.0 QphH@100GB**

**Price/Performance
\$45.00/QphH@100GB**

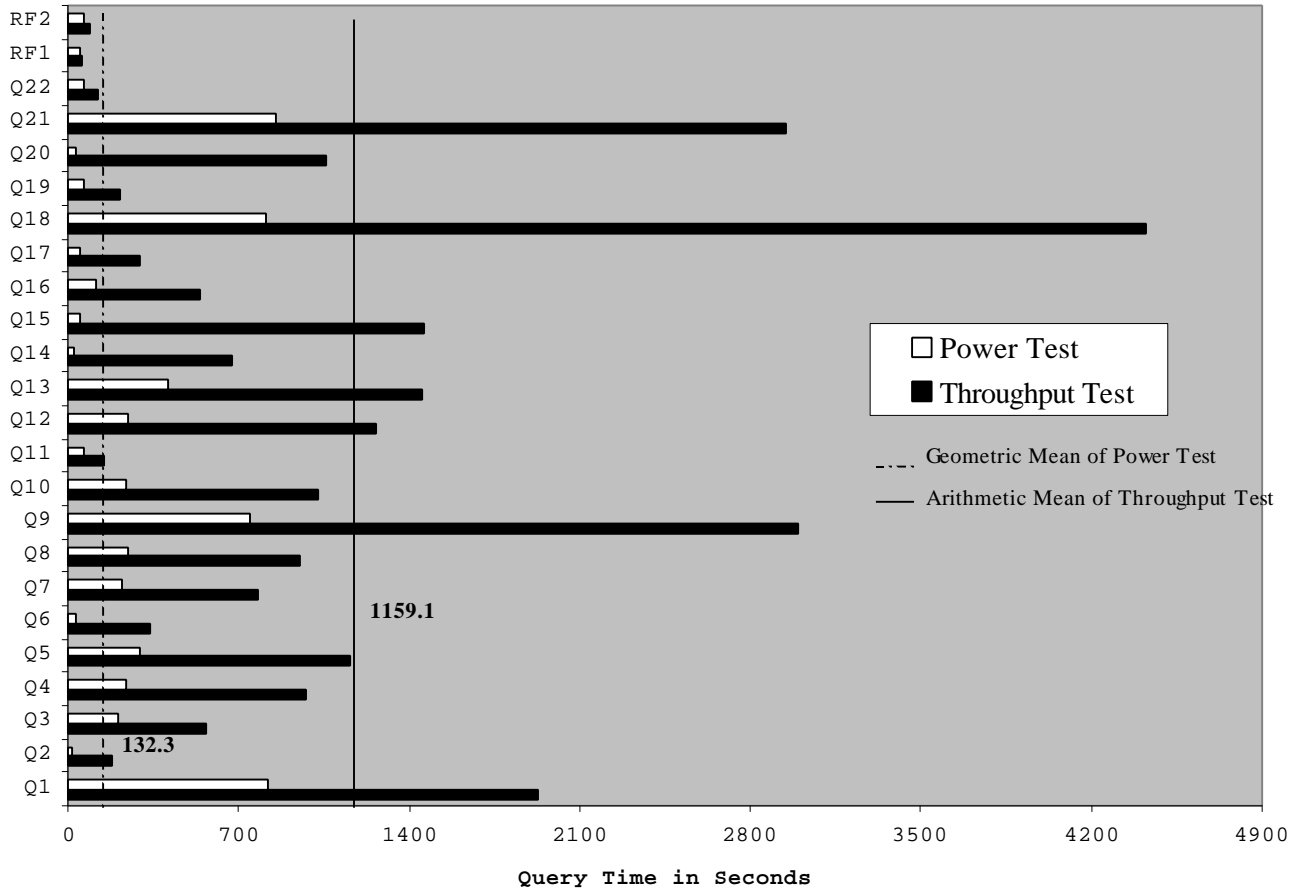
**Database Size
100GB**

**Database Manager
Microsoft SQL Server 2000 SP3
Enterprise Edition**

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

**Other Software
Visual C++ .NET Standard**

**Availability Date
May 27, 2003**



**Database Load Time
3:53:32**

**Total Disk/Database Size
16.76**

**Load Includes Backup
Y**

**RAID (Base tables only)
N**

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

**RAID (Everything)
Y**

System Configuration

Processors: 4 – 2.0GHz/512kB L2/2MB L3 Intel Xeon MP
Memory: 8GB RAM
Disk Drives: 1 – 36GB 15k HDD
 14 – 36GB 10k HDD
 70 – 18GB 15k HDD

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



**PowerEdge 6650/2.0GHz using
Windows 2003 Server EE and SQL
Server 2000 EE SP3**

TPC-H Revision 2.0.0

Report Date 4/28/03

Price/Performance

Performance

Availability Date

\$45 / QphH@100GB

1984.0 QphH@100GB

5/27/2003

Description	Part No.	Third Party		Unit Price	Quantity	Extended Price	3 Yr Maintenance Price
		Brand	Price				
Database Server Hardware:							
SYSTEM: PowerEdge 6650 2.0GHz/2MB L3	221-1983	1	1	\$6,658	1	\$6,658	
PROC: Quad Procs, 2.0GHz/2MB Xeon	311-2348	1	1	\$14,999	1	\$14,999	
MEM: 8GB RAM	311-1548	1	1	\$4,499	1	\$4,499	
DISK: 1x36GB 15k SCSI	340-3785	1	1	\$449	1	\$449	
NIC: Dual Integrated Broadcom Gigabit NIC Adapters	Included in SYSTEM.					\$0	
CONTROLLER: LSI MegaRAID Elite 1650	4942510264A	2	2	\$970	6	\$5,820	
SPARES: LSI MegaRAID Elite 1650	Spares priced to spec.	2	2	\$970	2		\$1,940
ACCESSORY: Rapid Rail Racks	310-1453	1	1	\$349	1	\$349	
MAINT: 3 Years 4Hour-7x24, SILVER Support (Initial/2Yr Ext.)	900-6370/900-6352	1	1	\$1,282	1		\$1,282
POWER: AC Switch (Dual Power Cords)	310-1446	1	1	\$299	1	\$299	
MONITOR: DELL E551 15"	320-0960	1	1	\$149	1	\$149	
Database Server Software:						Database Server	
						Hardware Subtotal:	\$33,222
OS: Windows 2003 Enterprise Server	P72-00264	3	3	\$2,399	1	\$2,399	Included below.
DBMS: SQL Server 2000 Enterprise Edition	810-00652	3	3	\$5,549	1	\$5,549	Included below.
DBMS: SQL Server 2000 Client License	359-00532	3	3	\$7,300	1	\$7,300	Included below.
APP: Visual C++ .NET Standard	254-00170	3	3	\$109	1	\$109	Included below.
MAINT: Microsoft DB Server Support Package	PRO-PRORS-16U-01	3	3	\$1,950	3		\$5,850
						Database Server	
						Software Subtotal:	\$15,357
SYSTEM: PowerVault 220S - 14 HDD Storage System	220-4476	1	1	\$1,256	6	\$7,536	
ACCESSORY: PowerVault 220 Locking Bezel	313-1308	1	1	\$39	6	\$234	
CTRL: Ultra3 SCSI Redundant Enclosure Management Module	340-3090	1	1	\$634	6	\$3,804	
POWER: Redundant Power Option	310-0677/310-0682	1	1	\$299	6	\$1,794	
ACCESSORY: Rapid Rails	310-0684	1	1	\$114	6	\$684	
DISK: 7x36GB 10k SCSI	340-3293	1	1	\$1,743	2	\$3,486	
DISK: 7x18GB 15k SCSI	340-3554	1	1	\$1,743	10	\$17,430	
CBL: 2 Cables,PERC,12M, PV220S	310-1686	1	1	\$99	6	\$594	
MAINT: 3 Years 4Hr/7x24, SILVER Support (Initial/2Yr Ext.)	900-6790/900-6792	1	1	\$1,099	6		\$6,594
RACK: PE4210,DOORS,GRND,42U,PS	220-4492	1	1	\$606	1	\$606	
RACK ACCESSORY: 42U Rack, Interconnect Kit, PS to TS	310-1283	1	1	\$119	1	\$119	
RACK POWER: Power Strip, 6 Socket	310-0081	1	1	\$69	1	\$69	
RACK MAINT: 3 Years BRONZE Support (Initial/2Yr Ext.)	900-6220/900-6222	1	1	\$283	1		\$283
Storage Subtotal:						\$36,356	\$6,877
Total:						\$84,935	\$15,949
Dell Discounts:*						(\$11,136)	
3 Year Cost of Ownership		\$89,748					
QphH@100GB		1984					
\$/ QphH@100GB		\$45.00					

* Dell discount is based upon total system cost as purchased by a regular customer. Pricing may be verified by calling 1-800-BUY-DELL and referencing quote number 106668362 as the complex quote.

1 Dell

2 www.buyisillogic.com

3 Microsoft

Independently Audited by:

Lorna Livingtree

Performance Metrics

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 section 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.



**PowerEdge 6650/2.0GHz Using
Microsoft SQL Server 2000
SP3 Enterprise Edition**

TPC-H Revision 2.0

**Report Date:
April 28, 2003**

Numerical Quantities Summary

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	16.76
Start of Database Load	4/19/2003 17:12:01
End of Database Load	4/19/2003 21:05:33
Database Load Time	3:53:32
Query Streams for Throughput Test	5
TPC-H Power	2721.5
TPC-H Throughput	1446.4
TPC-H Composite Query-per-Hour Metric (QphH@100GB)	1984.0
Total System Price Over 3 Years	\$89,748
TPC-H Price Performance Metric (\$/QphH@100GB)	\$45

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 27379 seconds

Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
Stream00	419210533	4/22/03 15:35:36	4/22/03 17:15:09	1:39:33
Stream01	419210534	4/22/03 17:15:09	4/23/03 00:13:58	6:58:49
Stream02	419210535	4/22/03 17:15:09	4/23/03 00:39:07	7:23:57
Stream03	419210536	4/22/03 17:15:09	4/23/03 00:33:10	7:18:01
Stream04	419210537	4/22/03 17:15:09	4/23/03 00:36:17	7:21:08
Stream05	419210538	4/22/03 17:15:09	4/22/03 23:38:11	6:23:02
Refresh00		4/22/03 15:35:36	4/22/03 17:15:09	1:39:33
Refresh01		4/23/03 00:39:07	4/23/03 00:41:15	0:02:09
Refresh02		4/23/03 00:41:15	4/23/03 00:43:48	0:02:33
Refresh03		4/23/03 00:43:48	4/23/03 00:46:20	0:02:32
Refresh04		4/23/03 00:46:20	4/23/03 00:48:54	0:02:34
Refresh05		4/23/03 00:48:54	4/23/03 00:51:27	0:02:33



Numerical Quantities Summary

Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	818.6	15.2	207.5	237.3	294.2	33.8	224.2	249.9
Stream01	1804.1	256.8	660.2	1113.2	1432	258.5	824.6	444.9
Stream02	1903.1	103.5	985.2	882.9	1239.9	45.2	843	402.4
Stream03	1864.5	275.9	317.9	805.4	1266.2	590.8	1137.7	2122.9
Stream04	2053.4	138.7	279	1035.5	721.3	328.2	451.2	1260.1
Stream05	2003.3	142	570.5	1044.5	1107.9	474.5	652.1	542.6
Min Qi	1804.1	103.5	279	805.4	721.3	45.2	451.2	402.4
Max Qi	2053.4	275.9	985.2	1113.2	1432	590.8	1137.7	2122.9
Avg Qi	1925.7	183.4	562.6	976.3	1153.5	339.4	781.7	954.6
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	750.8	234.1	64	248.2	408	24.7	49.8	116.9
Stream01	2820.6	1071.6	162.9	1609.4	1804.7	541.1	1666	426.9
Stream02	1978.1	958	133.4	1314.2	1256	1343	1134	767
Stream03	2908.2	1027.1	206.5	1112.2	1623.6	725.5	1367.7	322.7
Stream04	4614	1099.1	112.3	1215.8	1550.5	145.7	1298.3	762.4
Stream05	2673	982.3	140.2	1071.5	1045.6	589.5	1849.4	413.8
Min Qi	1978.1	958	112.3	1071.5	1045.6	145.7	1134	322.7
Max Qi	4614	1099.1	206.5	1609.4	1804.7	1343	1849.4	767
Avg Qi	2998.8	1027.6	151.1	1264.6	1456.1	669	1463.1	538.6
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	48.3	814.5	65.5	29.8	853.5	68.9	51.7	63.1
Stream01	528.4	4794.6	372.4	198.4	2185.8	152.2	45.5	83
Stream02	242.3	4573.8	215.9	3980.7	2184.6	151	66.5	86
Stream03	342	4522.4	104.3	165.2	3349.4	123.4	66.6	85.3
Stream04	189.5	3610.1	95.4	806.6	4627	74.3	64.2	89.4
Stream05	171.6	4623.7	268.7	150	2369.7	95.2	63.8	89.4
Min Qi	171.6	3610.1	95.4	150	2184.6	74.3	45.5	83
Max Qi	528.4	4794.6	372.4	3980.7	4627	152.2	66.6	89.4
Avg Qi	294.8	4424.9	211.3	1060.2	2943.3	119.2	61.3	86.6