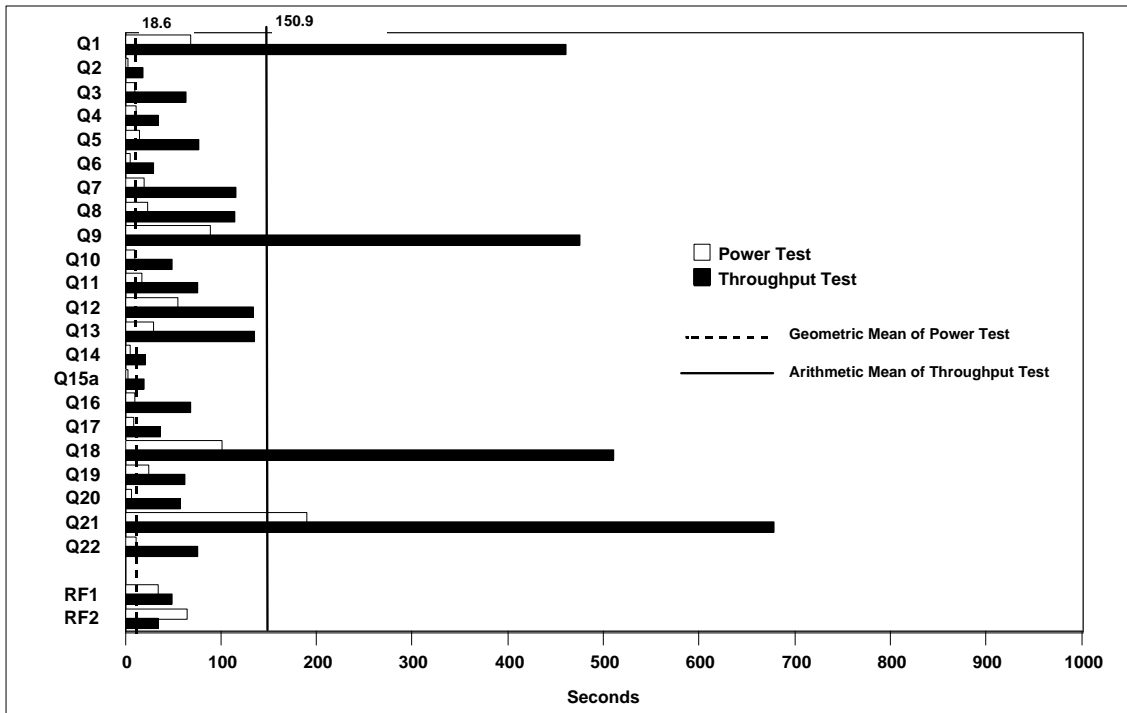


<b>IBM Corporation</b>	<b>IBM® System x™ 3950 M2 with Microsoft® SQL Server 2005</b>		TPC-H Rev 2.6.1	
			Report Date: Nov. 28, 2007 Amended: Feb. 18, 2008	
Total System Cost		Composite Query-per-Hour Metric		Price/Performance
<b>\$ 248,635 USD</b>		<b>46,034.4 QphH @ 300GB</b>		<b>\$ 5.40 USD per QphH @ 300GB</b>
Database Size	Database Manager	Operating System	Other Software	Availability Date
<b>300GB</b>	<b>Microsoft SQL Server 2005 Enterprise x64 Editon</b>	<b>Microsoft Windows® Server 2003 R2 Enterprise x64 Edition SP2</b>	<b>Microsoft Visual Studio Standard 2005</b>	<b>Mar. 7, 2008</b>



<b>Database Load Time: 7:21:03</b>		<b>Load Included Backup: Y</b>	<b>Total Data Storage / Database Size: 74.38</b>
<b>RAID (Base Tables Only): N</b>		<b>RAID (Base Tables and Auxiliary Data Structures): N</b>	<b>RAID (All): N</b>
<b>Configuration</b>			
Processors/Cores/Threads	8/32/32	Intel Xeon Processor X7350 (2.93GHz, 4MB L2 Cache per 2 Cores)	
Memory	32	8GB (2 x 4GB) PC2-5300 ECC DDR2 SDRAM RDIMM	
Disk Controllers	13	IBM ServeRAID-MR10 SAS/SATA Controller	
Disk Drives	300	73.4GB 15K SAS Drive	
	4	73.4GB 10K SFF SAS Drive	
Total Disk Storage		22314GB	

**IBM Corporation**

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Description	Part Number	Brand	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
<b>Server Hardware</b>							
IBM System x3950 M2 (2 x Intel Xeon Processor X7350 with 2.93GHz/2x4MB L2 Cache, 4 Memory Cards, 8 x 1GB DIMM, onboard SAS enablement key, cables, integrated dual-port 10/100/1000 Gigabit Ethernet)	7141-4SU	IBM	1b	20,499	2	40,998	
Intel Xeon Processor 7350 (2.93GHz/1066MHz FSB/2x4MB L2)	44E4243	IBM	1b	3,579	4	14,316	
8GB (2x4GB) 667MHz PC2-5300 ECC DDR2 SDRAM DIMM	41Y2768	IBM	1b	1,699	32	54,368	
73GB 10K 2.5" Hot-Swap SAS SFF	40K1052	IBM	1b	319	4	1,276	
IBM ServeRAID-MR10M SAS/SATA Controller	43W4339	IBM	1b	1,049	13	13,637	
IBM SAS 3m Cable	39R6531	IBM	1b	135	25	3,375	
IBM T115 15-inch TFT Display	494215U	IBM	1a	209	1	209	
IBM Preferred Pro USB Keyboard	40K9584	IBM	1b	29	1	29	
IBM 3-Button Optical Mouse - Black - USB	40K9201	IBM	1b	19	1	19	
ServicePac for 3-Year 24x7x4 Support (x3950 M2)	96P2688	IBM	1b	3,390	2		6,780
ServicePac for 3-Year 24x7x4 Support (Display)	10N3110	IBM	1b	90	1		90
<b>Subtotal</b>						<b>128,227</b>	<b>6,870</b>
<b>Server Storage</b>							
IBM System Storage EXP3000	172701X	IBM	1b	3,199	25	79,975	
IBM 73.4GB 15K SAS HDD	40K1043	IBM	1b	309	300	92,700	
IBM UPS 750TLV	2130R1X	IBM	1b	299	1	299	
IBM S2 42U Standard Rack	93074RX	IBM	1b	1,489	2	2,978	
ServicePac for 3-Year 24x7x4 Support (EXP3000)	41L2768	IBM	1b	760	25		19,000
ServicePac for 3-Year 24x7x4 Support (Rack)	41L2760	IBM	1b	300	2		600
<b>Subtotal</b>						<b>175,952</b>	<b>19,600</b>
<b>Server Software</b>							
Microsoft SQL Server 2005 Enterprise x64 Edition	810-04779	Microsoft	2a	13,969	1	13,969	
Microsoft SQL Server 2005 Client License	359-01911	Microsoft	2a	163	35	5,705	
Microsoft Windows Server 2003 R2 Enterprise x64 Edition	P72-01684	Microsoft	2a	3,999	1	3,999	
Microsoft Visual Studio Standard 2005	127-00012	Microsoft	2b	250	1	250	
Microsoft Problem Resolution Services		Microsoft	2b	245	1		245
<b>Subtotal</b>						<b>23,923</b>	<b>245</b>
<b>Total</b>						<b>328,102</b>	<b>26,715</b>
IBM Large Purchase Discount (See Note 1.)	29.85%		1b			98,621	
Microsoft Open Program Discount Schedule	31.94%		2a			7,561	

Pricing: 1 - IBM - 1-888-SHOP-IBM, ext. 5821; 2 - Microsoft  
 Note 1: Discount based on IBM Direct guidance applies to all line items where Pricing=1b.  
 Pricing is for this system or one of similar size.

<b>Three-Year Cost of Ownership USD:</b>	\$248,635
<b>QpH@300GB:</b>	46,034.4
<b>\$ USD/QpH@300GB:</b>	\$5.40

Audited by Francois Raab, InfoSizing, Inc. ([www.sizing.com](http://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 stated prices are not available according to these terms, please inform the TPC at [pricing@tpc.org](mailto:pricing@tpc.org). Thank you.

**IBM Corporation****IBM System x3950 M2  
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## Measurement Results:

Database Scale Factor	300
Total Data Storage/Database Size	74.38
Start of Database Load	11-22-07 8:20:33
End of Database Load	11-22-07 15:41:36
Database Load Time	7:21:03
Query Streams for Throughput Test	6
TPC-H Power	58,196.9
TPC-H Throughput	36,413.8
TPC-H Composite Query-per-Hour (QphH@300GB)	46,034.4
Total System Price over 3 Years	\$ 248,635 USD
TPC-H Price/Performance Metric (\$/QphH@300GB)	\$ 5.40 USD

## Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 3,915

## Duration of Stream Execution:

	Seed	Query Start Date/Time Query End Date/Time	RF1 Start Date/Time RF1 End Date/Time	RF2 Start Date/Time RF2 End Date/Time	Duration
<b>Stream 0</b>	1122154136	11/22/07 17:01:56 11/22/07 17:15:32	11/22/07 17:01:56 11/22/07 17:02:52	11/22/07 17:14:56 11/22/07 17:15:31	00:13:36
<b>Stream 1</b>	1122154137	11/22/07 17:15:32 11/22/07 18:10:50	11/22/07 18:12:25 11/22/07 18:13:19	11/22/07 18:13:19 11/22/07 18:13:55	00:55:18
<b>Stream 2</b>	1122154138	11/22/07 17:15:32 11/22/07 18:12:11	11/22/07 18:13:55 11/22/07 18:14:45	11/22/07 18:14:45 11/22/07 18:15:19	00:56:39
<b>Stream 3</b>	1122154139	11/22/07 17:15:32 11/22/07 18:08:33	11/22/07 18:15:19 11/22/07 18:16:09	11/22/07 18:16:09 11/22/07 18:16:42	00:53:00
<b>Stream 4</b>	1122154140	11/22/07 17:15:32 11/22/07 18:11:27	11/22/07 18:16:42 11/22/07 18:17:27	11/22/07 18:17:27 11/22/07 18:18:00	00:55:54
<b>Stream 5</b>	1122154141	11/22/07 17:15:32 11/22/07 18:09:47	11/22/07 18:18:00 11/22/07 18:18:47	11/22/07 18:18:47 11/22/07 18:19:23	00:54:14
<b>Stream 6</b>	1122154142	11/22/07 17:15:32 11/22/07 18:12:25	11/22/07 18:19:23 11/22/07 18:20:08	11/22/07 18:20:08 11/22/07 18:20:47	00:56:52

**IBM Corporation**

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TPC-H Timing Intervals (in seconds):

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 0	68.5	2.5	10.2	11.7	15.7	5.4	19.9	24.1	89.0	10.5	17.1	54.7
Stream 1	481.3	18.0	60.0	28.3	77.1	24.0	110.4	108.7	415.1	38.2	86.9	161.6
Stream 2	483.4	23.1	61.0	34.1	72.9	29.6	180.6	110.3	493.5	60.2	77.2	175.2
Stream 3	482.0	18.8	72.7	41.1	85.6	34.3	125.0	131.7	438.4	41.4	60.9	127.6
Stream 4	415.0	16.6	44.8	37.5	85.4	33.4	111.2	102.9	600.1	41.5	85.8	112.4
Stream 5	434.1	21.3	70.9	31.3	73.7	21.0	82.7	97.0	462.9	35.6	67.4	95.2
Stream 6	467.7	18.2	74.1	36.2	69.5	37.8	87.9	136.8	442.0	79.3	79.6	136.0
Minimum	415.0	16.6	44.8	28.3	69.5	21.0	82.7	97.0	415.1	35.6	60.9	95.2
Average	460.6	19.3	63.9	34.5	77.4	30.0	116.3	114.6	475.3	49.4	76.3	134.7
Maximum	483.4	23.1	74.1	41.1	85.6	37.8	180.6	136.8	600.1	79.3	86.9	175.2

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	29.9	5.0	3.2	10.8	9.7	101.4	25.2	6.5	190.5	12.1	56.9	35.1
Stream 1	111.7	18.0	20.0	66.0	36.5	497.2	46.0	66.8	783.5	62.2	54.5	35.5
Stream 2	142.8	31.5	19.0	75.1	58.3	493.4	72.5	47.0	570.7	87.6	50.2	34.1
Stream 3	108.9	19.2	18.8	65.0	40.6	443.7	72.2	56.1	609.5	87.1	49.8	32.7
Stream 4	144.7	18.5	22.9	76.7	33.0	469.6	54.8	35.0	756.9	57.8	45.0	32.8
Stream 5	142.3	22.9	21.6	70.4	28.8	451.7	66.1	94.7	782.8	79.9	47.2	35.5
Stream 6	160.3	20.2	20.9	57.8	21.7	706.6	65.6	43.9	569.9	80.2	45.6	38.3
Minimum	108.8	18.0	18.8	57.8	21.7	443.7	46.0	35.0	569.9	57.8	45.0	32.7
Average	135.1	21.7	20.5	68.5	36.5	510.4	62.9	57.3	678.9	75.8	48.7	34.8
Maximum	160.3	31.5	22.9	76.7	58.3	706.6	72.5	94.7	783.5	87.6	54.5	38.3