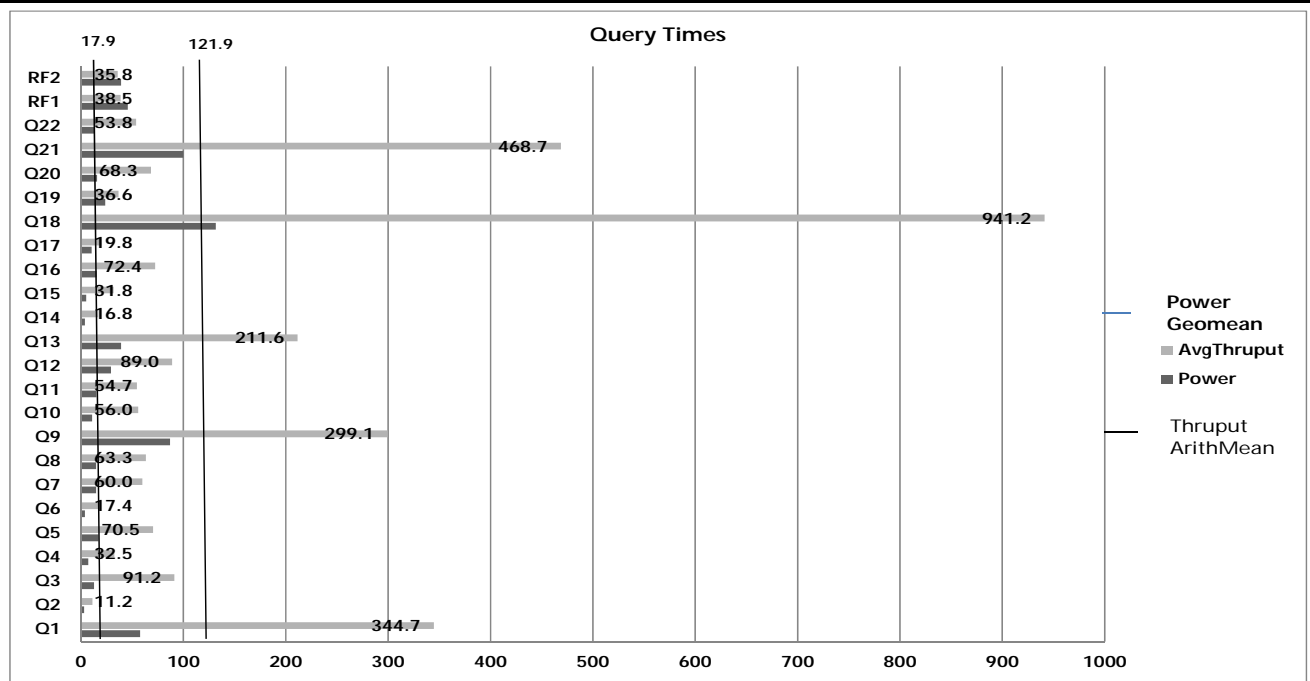


IBM Corporation	IBM® System x®3850 X5 8P Microsoft® SQL Server 2008 R2			TPC-H Rev. 2.13.0
				Report Date 4/5/11
Total System Cost	Composite Query-per-Hour Metric			Price/Performance
\$238,375 USD	173,961.8 QphH @ 1000GB			\$1.37 per QphH @ 1000GB
Database Size	Database Manager	Operating System	Other software	Availability
1000GB	Microsoft SQL Server 2008 R2 Enterprise x64 Edition	Microsoft Windows Server R2 Enterprise x64 Edition	n.a.	May 20, 2011



Database Load Time: 14:44:52		Total Data Storage / Database Size: 7.0	Load Included Backup: Y	Memory Ratio=200%
RAID (Base Tables Only): N		RAID (Base Tables and Auxiliary Data Structures): N	RAID (All): N	
Configuration				
Processors/Cores/Threads	8/80/80	Intel Xeon Processor E7-8870, 2.4GHz, 30MB L3 Cache		
Memory	128	16GB (1x16GB) 4R PC3-8500 1066MHz LP RDIMM		
Disk Controllers	2	IBM ServeRAID-M1015 SAS/SATA Controller		
Disk Drives	2	146GB 15K 6Gbps SAS 2.5" SFF Slim-HS HDD		
	14	300GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD		
	1	640GB High IOPS MLC Duo Adapter for IBM System x		
	6	320GB High IOPS MS Class SSD PCIe Adapter		
Total Disk Storage		7052GB		

**IBM
Corporation**

**IBM® System x®3850 X5 8P
Microsoft® SQL Server 2008 R2**

**TPC-H
Rev. 2.13.0**

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IBM Corporation	IBM System x3850 X5				TPC-H Revision 2.13.0			
	Microsoft SQL Server 2008 R2				Report Date: April 5, 2011			
Description	Part Number	Brand	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price	
Server Hardware								
x3850 X5 (2 x Intel Xeon Processor E7-8850, 4x4GB Memory, 2 Memory Cards)	7143-C1Y	IBM	1a*	\$16,519				
Remove 2 Intel Xeon E7-8850 processors				(8,790)				
Subtotal								
Add 2 Intel Xeon E7-8870 processors				14,550				
Total				22,279	2	44,558		
Intel Xeon Processor E7-8870 (2.4GHz / 30MB L3)	69Y1899	IBM	1a*	7,275	4	29,100		
IBM x3850 X5 QPI Scalability Kit	46M0072	IBM	1a	1,795	1	1,795		
16GB (1x16GB) QuadRank PC3-8500 1066MHz LP RDIMM	46C7483	IBM	1	999	128	127,872		
IBM x3850 X5 Memory Expansion Card	46M0071	IBM	1	299	12	3,588		
IBM ServeRAID-M1015 SAS/SATA Controller	46M0831	IBM	1	299	2	598		
IBM 146GB 15K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0677	IBM	1	399	2	798		
IBM 300GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	42D0637	IBM	1	449	14	6,286		
640GB High IOPS MLC Duo Adapter for IBM System x	81Y4519	IBM	1	14,999	1	14,999		
IBM 320GB High IOPS MS Class SSD PCIe Adapter	46M0898	IBM	1	8,099	6	48,594		
IBM 3-Button Optical Mouse - Black - USB	40K9201	IBM	1a	19	1	19		
IBM Preferred Pro USB Keyboard	40K9584	IBM	1	29	1	29		
ServicePac for 3-Year 24x7x4 Support (x3850 X5)	84Y2233	IBM	1	1,250	2		2,500	
Acer V173Djb Black 17" 5ms LCD Monitor (2 spares)	V173Djb		3	97	3	291		
					Subtotal	278,527	2,500	
Server Software								
Microsoft SQL Server 2008 R2 Enterprise Edition w/ 25 CALs	810-08553	Microsoft	2	\$8,318	1	8,318		
Microsoft SQL Server 2008 R2 Client Access License	359-05354	Microsoft	2	\$114	45	5,130		
Microsoft Windows Server 2008 R2 Enterprise Edition	P72-04217	Microsoft	2	2,280	1	2,280		
Microsoft Problem Resolution Services	N/A	Microsoft	2	259	1		259	
					Subtotal	15,728	259	
					Total	294,255	2,759	
Dollar Volume Discount (See Note 1.)	28.57%		1			58,639		
Pricing: 1 - IBM - 1-800-656-0833, ext. 35334; 2 - Microsoft; 3 - newegg.com					Three-Year Cost of Ownership USD		\$238,375	
Note 1: Discount applies to all line items where Pricing=1; pricing is for these or similar quantities.					QpH@1000GB:		173,961.80	
Discounts for similarly sized configurations will be similar to what is quoted here, but may vary based on the components in the price quotation					\$ USD/QpH@1000GE		\$1.37	
* These components are not immediately orderable. See the FDR for more information.								
Benchmark results and methodology audited by Francois Raab, 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 stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.								

IBM Corporation	IBM® System x®3850 X5 8P Microsoft® SQL Server 2008 R2	TPC-H Rev. 2.13.0
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Measurement Results	
Database Scale Factor	1000
Total Data Storage/Database Size	7.0
Start of Database Load	03/21/11 00:46:47
End of Database Load	03/21/11 15:31:39
Database Load Time	14:44:52
Query Streams for Throughput Test	7
TPC-H Power	200,899.9
TPC-H Throughput	150,635.8
TPC-H Composite Query-per-Hour (QphH@1000GB)	173,961.8
Total System Price over 3 Years	\$238,375 USD
TPC-H Price/Performance Metric (\$/QphH@1000GB)	\$ 1.37 USD

Measurement Interval
Measurement Interval in Throughput Test (Ts) = 3680.8

Duration of Stream Execution:					
	Seed	Query Start (D/T) Query End (D/T)	RF1 Start (D/T) RF1 Stop (D/T)	RF2 Start (D/T) RF2 Stop (D/T)	Duration
Stream 0	321153138	3/21/11 15:35:50 3/21/11 15:46:20	3/21/11 15:35:04 3/21/11 15:35:50	3/21/11 15:46:20 3/21/11 15:46:59	00:10:30
Stream 1	321153139	3/21/11 15:47:00 3/21/11 16:39:31	3/21/11 16:39:34 3/21/11 16:40:12	3/21/11 16:40:12 3/21/11 16:40:50	00:52:30
Stream 2	321153140	3/21/11 15:47:00 3/21/11 16:39:33	3/21/11 16:40:50 3/21/11 16:41:29	3/21/11 16:41:29 3/21/11 16:42:06	00:52:33
Stream 3	321153141	3/21/11 15:47:00 3/21/11 16:39:34	3/21/11 16:42:06 3/21/11 16:42:45	3/21/11 16:42:45 3/21/11 16:43:21	00:52:33
Stream 4	321153142	3/21/11 15:47:00 3/21/11 16:38:33	3/21/11 16:43:22 3/21/11 16:44:01	3/21/11 16:44:01 3/21/11 16:44:36	00:51:32
Stream 5	321153143	3/21/11 15:47:00 3/21/11 16:39:26	3/21/11 16:44:37 3/21/11 16:45:15	3/21/11 16:45:15 3/21/11 16:45:52	00:52:26
Stream 6	321153144	3/21/11 15:47:00 3/21/11 16:38:24	3/21/11 16:45:52 3/21/11 16:46:31	3/21/11 16:46:31 3/21/11 16:47:06	00:51:23
Stream 7	321153145	3/21/11 15:47:00 3/21/11 16:35:30	3/21/11 16:47:07 3/21/11 16:47:46	3/21/11 16:47:46 3/21/11 16:48:20	00:49:53

**IBM
Corporation**

**IBM® System x®3850 X5 4P
Microsoft® SQL Server 2008 R2**

**TPC-H
Rev. 2.13.0**

**Report Date
4/5/11**

TPC-H Timing Intervals (in seconds)

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	57.8	2.9	12.8	7.1	17.1	3.9	14.7	14.7	86.9	10.8	15.0	29.2
Stream 01	351.9	12.4	85.9	24.2	60.1	16.1	52.3	61.1	313.9	47.0	54.6	113.1
Stream 02	347.4	9.8	102.9	34.6	69.2	18.4	48.4	61.1	347.4	58.8	83.0	115.8
Stream 03	369.3	11.1	63.1	34.8	77.8	18.2	70.3	72.9	270.7	55.6	64.0	117.6
Stream 04	365.2	10.5	101.9	35.8	75.6	16.5	67.2	50.9	290.3	52.8	39.5	63.7
Stream 05	366.4	11.8	88.5	35.8	69.2	16.2	60.3	68.2	290.1	57.4	51.3	61.5
Stream 06	327.0	13.4	107.0	33.5	65.8	19.3	58.2	72.5	304.8	67.7	38.3	67.2
Stream 07	285.8	9.4	89.1	28.5	75.5	17.1	63.0	56.4	276.8	52.5	52.1	84.2
Minimum	57.8	2.9	12.8	7.1	17.1	3.9	14.7	14.7	86.9	10.8	15.0	29.2
Maximum	369.3	13.4	107.0	35.8	77.8	19.3	70.3	72.9	347.4	67.7	83.0	117.6
Average	308.9	10.2	81.4	29.3	63.8	15.7	54.3	57.2	272.6	50.3	49.7	81.5

Query	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	39.1	3.9	5.0	15.1	10.4	131.7	23.5	15.8	99.9	12.8	45.6	39.0
Stream 01	189.7	18.2	28.2	68.5	14.7	947.8	36.5	67.2	527.8	59.6	37.7	37.2
Stream 02	208.3	19.6	29.8	79.0	22.6	931.6	37.6	77.2	401.3	49.7	38.4	36.9
Stream 03	218.3	12.8	28.7	76.1	17.7	972.3	42.5	70.5	449.2	40.0	38.6	36.1
Stream 04	232.7	16.9	33.0	64.8	22.1	886.9	34.8	63.5	499.7	68.4	38.9	35.2
Stream 05	201.8	16.8	35.2	71.1	21.6	933.9	33.1	74.7	523.4	57.6	38.5	36.3
Stream 06	228.9	17.4	35.4	67.5	20.7	894.0	37.0	72.4	489.5	46.3	38.6	35.1
Stream 07	201.2	16.2	32.2	80.0	19.3	1022.1	34.5	52.6	390.1	55.2	38.9	34.1
Minimum	39.1	3.9	5.0	15.1	10.4	131.7	23.5	15.8	99.9	12.8	37.7	34.1
Maximum	232.7	19.6	35.4	80.0	22.6	1022.1	42.5	77.2	527.8	68.4	45.6	39.0
Average	190.0	15.2	28.4	65.3	18.6	840.0	34.9	61.7	422.6	48.7	39.4	36.2