



**IBM System x3850 X5
DB2® 9.7**

TPC-C Rev. 5.11

**Report Date:
Nov. 16, 2010
Revised May 16, 2011**

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date	
\$1,393,681 USD	2,308,099	\$0.60 USD	May 16, 2011	
Database Processors/Cores/Threads	Database Manager	Operating System	Other Software	No. Users
4/32/64 2.26 GHz Intel Xeon X7560	DB2 9.7	SLES 11 SP1	Microsoft Visual C++ Microsoft COM+	1,839,360

16 Clients
16 x IBM System x3550 M2
2 x Intel E5530 QC 2.40GHz
1GB Memory
1 x 146GB 10krpm SAS Drive
2 x 1Gb Ethernet

IBM System x3850 X5
4 x Intel Xeon X7560 (2.26GHz)
1.5TB Memory
1 x QLE2464 Quad Port 4GB FC
6 x IBM ServeRAID M5025
1 x IBM 6Gb SSD HBA
2 x Integrated 1Gb Ethernet
8 x 200 GB Internal 1.8" SATA SSD

Storage
9 x IBM System Storage DS3400 Storage Controllers
28 x IBM System Storage EXP3000 Disk Enclosures
432 x 300 GB 15K RPM SAS Drives
12 x 450 GB 15K RPM SAS Drives
6 x LSI 620J Disk Enclosures
64 x 200GB 2.5" SAS SSD

System Components	Each of the 16 Clients		Server	
	Quantity	Description	Quantity	Description
Processors/Cores/Threads	2/8/8	2.4GHz Xeon E5530 4 x 256KB L2, 1 x 8MB L2	4/32/64	2.26 GHz Intel Xeon X7560 8 x 256KB L2 1 x 24MB L3
Memory	4	2 GB	96	16 GB
Disk Controllers	1	SAS	1 6 1 1 9	Integrated SAS ServeRAID-M5025 IBM 6Gb SSD HBA 4Gb quad-port FC Adapters IBM DS3400 Controllers for Data
Disk Drives	1	146 GB	432 12 8 64	300 GB 15K RPM SAS 450 GB 15K RPM SAS 1.8" 200GB SATA SSD drives 2.5" 200GB SAS SSD drives
Total Storage		584 GB		136 TB
Terminals	1	System Console	1	System Console

IBM Corporation		IBM x3850 X5		with DB2 9.7		TPC-C Revision 5.11		
						Report Date: Nov. 16, 2010; Revised May 16, 2011		
Description	Part Number	Brand	Price Source	Unit Price	Qty	Extended Price	3-Yr. Maint. Price	
Server Hardware								
IBM System x3850 X5/x3950 X5	7145AC1	IBM						
IBM System x3850 X5/x3950 X5 Base	7626	IBM	1	2,079	1	2,079		
Intel Xeon Processor X7560 8c 2.26GHz 24MB Cache 130w	4512	IBM	1	4,999	1	4,999		
Addl. Intel Xeon Processor X7560 8c 2.26GHz 24MB Cache 130w	4513	IBM	1	4,999	3	14,997		
IBM x3850 X5 and x3950 X5 Memory Expansion Card	5102	IBM	1	299	8	2,392		
x3850 X5 System Planar Boards	5695	IBM	1	3,259	1	3,259		
16GB (1x16GB, 4Rx4, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM	1707	IBM	1	1,109	64	70,976		
IBM MAX5 for System x	4199	IBM	1	7,495	1	7,495		
IBM MAX5 to x3850 X5 Cable Kit	4192	IBM	1	1,795	1	1,795		
16GB MAX5 1x16G Qrx4 PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM	2433	IBM	1	1,549	32	49,568		
IBM 6Gb SSD HBA	3876	IBM	1	699	1	699		
IBM eXFlash 8x 1.8" HS SAS SSD Backplane	4191	IBM	1	195	1	195		
IBM 1975W Power Supply	2111	IBM	1	699	2	1,398		
IBM 675W HE Redundant Power Supply	4782	IBM	1	299	1	299		
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	6311	IBM	1	10	4	40		
QPI Wrap Cord	5104	IBM	1	250	1	250		
Acer A181HLB 18.5" Wide LED Monitor	2146072	CDW	4	98	1	98		
IBM Preferred Pro Keyboard USB – US English 103P	40K9584	IBM	1	29	1	29		
ServeRAID M5025 SAS/SATA Controller	46M0830	IBM	1	649	6	3,894		
ServeRAID M5000 Series Performance Accelerator Key	81Y4426	IBM	1	399	6	2,394		
Qlogic 4Gb Fibre Channel card (+2 spares)	QLE2464	ALHDD	7	523	3	1,569		
3 Year Onsite Repair 24x7 4 Hour Response	67567CG	IBM	1		1		1,250	
						Subtotal	168,425	1,250
Server Storage								
IBM System Storage DS3400 FC Dual Controller	1726-42X	IBM	1	9,295	9	83,655		
IBM 1M SAS cable	39R6529	IBM	1	119	62	7,378		
IBM System Storage EXP3000	1727-01X	IBM	1	3,199	28	89,572		
IBM EXP3000 Environmental Services Module (ESM)	39R6515	IBM	1	999	28	27,972		
IBM 300GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	44W2234	IBM	1-s	529	432	228,528		
450GB 15K 3.5" Hot-Swap SAS	44W2239	IBM	1	709	12	8,508		
NetBAY S2 42U Standard Rack	93074RX	IBM	1	1,609	3	4,827		
IBM 200GB High IOPS 1.8" SATA SSD	43W7746	IBM	1	3,199	8	25,592		
LSI 620J JBOD Disk Enclosure (Incl 2 Spares)	LSI00217	LSI	9	2,041	8	16,328		
Smart Modular XceedIOPS 2.5" 200GB eMLC SAS SSD (Incl 7 Spares)	SG9XCA2E200GE10	Smart	8	1,800	71	127,800		
IBM System Storage SAN24B-4 Express	249824E	IBM	1	4,420	1	4,420		
4 pack SW Transceivers for 2109 models F08 or F16	45W0493	IBM	1	150	20	3,000		
8 Port Activation	45W0502	IBM	1	3,470	2	6,940		
ServicePac for 3-Year 24x7x4 Support (DS3400)	44J8073	IBM	1	1,300	9		11,700	
ServicePac for 3-Year 24x7x4 Support (EXP3000)	41L2768	IBM	1	760	28		21,280	
ServicePac for 3-Year 24x7x4 Support (Rack)	41L2760	IBM	1	300	3		900	
						Subtotal	634,520	33,880
Server Software								
DB2 ESE 9.7 SW License and Maintenance 12 Months		IBM	1	405.00	3200	1,296,000		
DB2 ESE 9.7 SW Maintenance Renewal - 1 Year		IBM	1	81.00	6400		518,400	
SUSE Linux Enterprise Server 11 SP1 for x86_64 1 Year Priority Support		Novell	3	1,499	3	4,497		
						Subtotal	1,300,497	518,400
Client Hardware								
IBM System x3550 M2 Base	7946AC1 5600	IBM	1	289	16	4,624		
Intel Xeon Processor E5530 4C (2.4GHz 8MB L3 Cache 1066MHz 80w)	3640	IBM	1	859	16	13,744		
Addl. Intel Xeon Processor E5530 4C (2.4GHz 8MB L3 Cache 1066MHz 80w)	4412	IBM	1	849	16	13,584		
2GB DDR3-1333 1Rx4 LP RDIMM x 4	3965	IBM	1	436	64	27,904		
IBM 146GB 10k 6Gbps SAS 2.5" SFF Slim-HS HDD	5537	IBM	1	259	16	4,144		
System Common planar for 1U/2U	5653	IBM	1	749	16	11,984		
PCI-Express (1x16 slot; LP) Riser Card 1	5076	IBM	1	59	16	944		
UltraSlim Enhanced SATA CD-RW / DVD-ROM Combo	4162	IBM	1	129	16	2,064		
PCI-Express (1x16 slot; FH/HL) Riser Card 2	4375	IBM	1	59	16	944		
ServeRAID-BR10i SAS/SATA Controller	3577	IBM	1	299	16	4,784		
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	6311	IBM	1	10	16	160		
3 Year Onsite Repair 24x7 4 Hour Response	6756298	IBM	1	450	16		7,200	
						Subtotal	84,880	7,200
Client Software								
Windows Server Web Edition 2008 R2	LWA-00984	Microsoft	5	469	16	7,504		
Visual Studio Standard 2008	127-00166	Microsoft	5	799	1	799		
Microsoft Problem Resolution Services	NA	Microsoft	5	259	1		259	
						Subtotal	8,303	259
Third-Party Components								
IOGEAR 2 port USB KVM Switch (2 spares)	575404	cdw	4	35	3	105		
UPS - powercom KIN-1500AP 1500VA 900Watts (2 spares)	N82E16842106115	newegg	6	135	3	405		
NETGEAR GS748T 48-port Gigabit Smart Switch (2 spares)	GS748TNA	cdw	4	660	5	3,300		
						Subtotal	3,810	0
						Total	2,200,435	560,989
IBM Dollar Volume Discount (See Note 1)						1	Note 1 Discount	1,367,743
Pricing: 1 - IBM - 1-800-656-0833 x35304; 2 - Qlogic; 3 - Novell; 4 - CDW.com; 5 - Micosoft 6 - newegg.com; 7 - allhdd.com; 8 - ClearComm 919-859-4400; 9 - Avnet 1-800-332-8638 Note 1: Discount based on IBM Direct guidance applies to all line items where Pricing=1. Pricing is for this system and software or one of similar size. S - One or more components of the measured configuration have been substituted in the Priced Configuration. See the FDR for details * These components are not immediately orderable. See the FDR for more information. Audited by Francois Raab, InfoSizing, Inc. (www.sizing.com)						Three-Year Cost of Ownership USD:		1,393,681
							tpmC:	2,308,099
							\$ USD/tpmC:	0.60
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 @ tpc.org. Thank you.								

Numerical Quantities Summary for the IBM System x3850 X5

MQTH, computed Maximum Qualified Throughput: 2,308,099 tpmC

<u>Response Times (in seconds)</u>	<u>90th %</u>	<u>Average</u>	<u>Maximum</u>
New Order	0.660	0.301	13.797
Payment	0.660	0.291	10.812
Order-Status	0.660	0.306	7.734
Delivery (interactive)	0.340	0.165	9.328
Delivery (deferred)	0.32	0.13	2.36
Stock-Level	0.660	0.298	13.297
Menu	0.344	0.167	13.156

Response time delay added for emulated components was 0.1 seconds

<u>Transaction Mix, in percent of total transactions</u>	<u>Percent</u>
New Order	44.950%
Payment	43.021%
Order-Status	4.010%
Delivery	4.008%
Stock-Level	4.010%

<u>Keying/Think Times (in seconds)</u>	<u>Min.</u>	<u>Average</u>	<u>Max.</u>
New Order	18.015/0.00	18.015/12.035	18.047/120.313
Payment	3.015/0.00	3.015/12.036	3.047/120.328
Order-Status	2.015/0.00	2.015/10.036	2.047/100.328
Delivery	2.015/0.00	2.015/5.035	2.047/50.313
Stock-Level	2.015/0.00	2.015/5.035	2.047/50.313

Test Duration

Ramp-up Time	46 minutes
Measurement interval	2 hours 0 minutes
Transactions during measurement interval (all types)	616,176,706

Checkpoints

Number of checkpoints	N/A
Checkpoint interval	N/A