IBM	**IBM @server xSeries 440 c/s** **with Microsoft SQL Server 2000**	TPC-C Rev. 5.0
		Report Date: Nov. 8, 2002

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$758,597	**112,740.87 tpmC**	**$6.73 / tpmC**	**March 31, 2003**

Processors	Database Manager	Operating System	Other Software	Number of Users
Server: 8 Intel® Xeon™ Processor MP 2.0GHz Clients:12 Pentium III 1.4GHz	**Microsoft® SQL Server 2000 Enterprise Edition SP3 with QFE**	**Microsoft Windows® .NET Datacenter Server 2003**	**Microsoft Visual C++ 6.0 Win32 Microsoft COM+**	**90,560**

6 RTEs emulating 90,560 Users

RXE-100 Remote I/O
6 x Mylex eXtremeRAID
2000 Adapter

2Gb/s IBM 2109
FC Switch

6 x IBM xSeries 220
12 x 1.4GHz Intel Pentium III

1 x IBM xSeries 440
8 x 2.0GHz/2MB Intel Xeon Processor MP
4 x Mylex eXtremeRAID 2000 Adapter
1 x 18.2GB 10K Internal Drive

29 x EXP300 Storage
378 x18.2GB Drive
28 x 36.4GB Drive
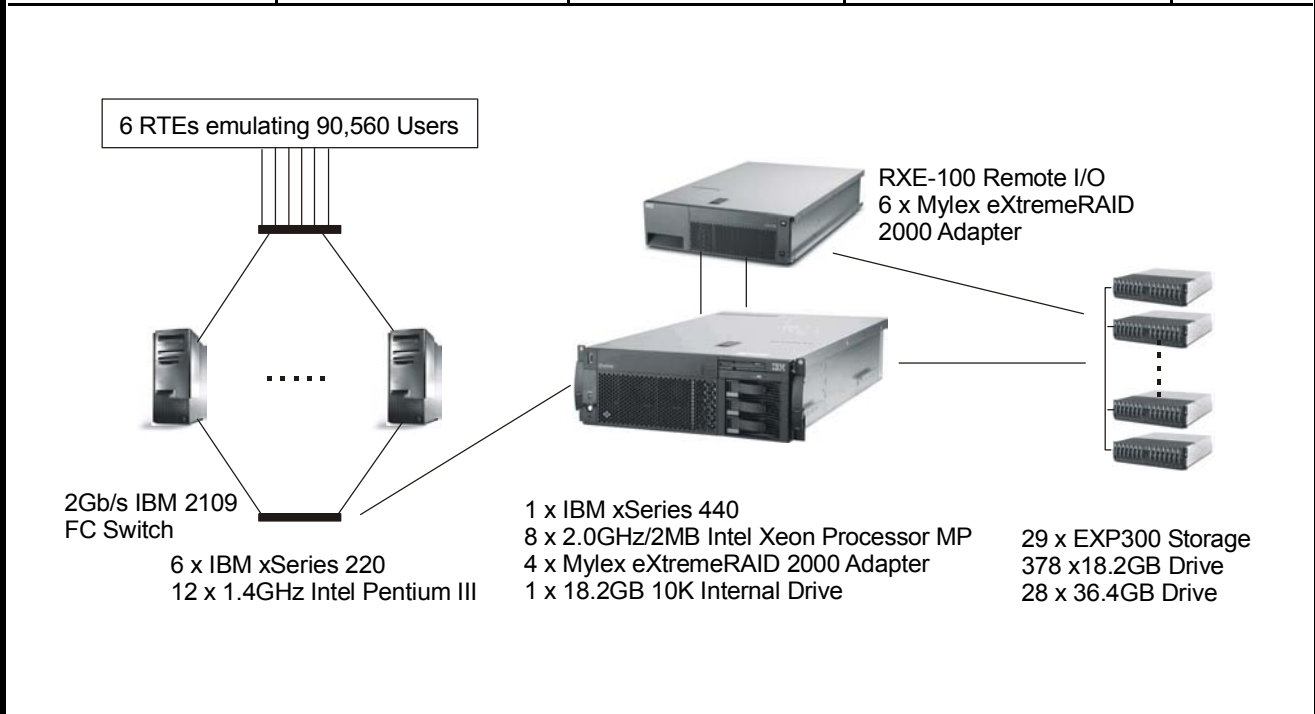
System Component	Qty	Server:	Qty	Each Client:
Processors	**8**	**2.0GHz Xeon Processor MP w/2MB L3 Cache**	**2**	**1.4GHz Pentium III w/512KB L2 Cache**
Cache				
Memory	**32**	**2GB ECC SDRAM**	**3**	**256MB**
Disk Controllers	**10**	**Mylex eXtremeRAID 2000 Adapter**	**1**	**Ultra160 SCSI Interface**
Disk Drives	**378**	**18.2GB (15000 rpm)**	**1**	**18.2GB Hard Disk**
	28	**36.4GB (15000 rpm)**		
	1	**18.2GB (10000 rpm)**		
Total Storage		**7364.55GB**		
Tape Drive	**1**	**20/40GB SCSI Tape Drive**		

IBM Corporation	IBM @server xSeries 440 c/s with Microsoft SQL Server 2000	TPC-C Rev. 5.0
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Description	Order Number	Third-Party Brand	Pricing	Unit Price	Qty	Ext. Price	3-Yr. Maint.*
Server Hardware							
IBM @server xSeries 440	8687-7RX	IBM	1	$40,299	1	$40,299	$3,390
Four 2.0GHz/2MB Xeon Processor MP							
xSeries SMP Expansion Module	59P5188	IBM	1	5,199	1	5,199	0
2.0GHz/2MB Xeon Processor MP	59P5173	IBM	1	6,599	4	26,396	0
2GB PC133 ECC SDRAM RDIMM	31P8840	IBM	1	4,999	32	159,968	0
Mylex eXtremeRAID 2000 Adapter***	08P3834	Mylex	2	1,228	12	14,736	0
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	1	275	0
QLogic 2350 Fibre Channel-VI Adapter***	QLA2350-BK	QLogic	3	2,568	4	10,272	0
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	IBM	1	105	29	3,045	0
IBM UPS 500	33L3477	IBM	1	99	1	99	0
E54 14" (13.8" Viewable) Color Monitor*	633147N	IBM	1	139	1	139	90
20/40GB Internal SCSI Tape Drive	00N7991	IBM	1	769	1	769	0
NetBAY42 Standard Rack Cabinet	9306421	IBM	1	1,439	3	4,317	900
Enterprise Rack Prep Fee	o6P5756	IBM	1	400	1	400	0
Enterprise Rack Installation Fee	06P7515	IBM	1	160	1	160	0
Option Integration Fee	58P8665	IBM	1	110	1	110	0
Image Load Fee	06P7505	IBM	1	35	1	35	0
Storage Hardware							
IBM EXP300 Rack Storage Enclosure*	35311RU	IBM	1	3,179	29	92,191	5,800
18.2GB 15K Ultra160 SCSI Drive	06P5767	IBM	1	439	378	165,942	0
36.4GB 15K Ultra160 SCSI Drive	06P5776	IBM	1	769	28	21,532	0
IBM RXE-100 Remote Expansion Encl.*	8684-1RX	IBM	1	4,569	1	4,569	1,050
IBM Remote I/O PCI-X 6-Slot Exp. Kit	31P5998	IBM	1	1,699	1	1,699	0
3.5 Remote I/O Cable Kit	31P6102	IBM	1	599	1	1,198	0
					Subtotal	$552,751	$11,230
Server Software							
Microsoft SQL Server 2000 EE	810-00846	Microsoft	4	16,541	8	$132,328	$0
Microsoft .NET Datacenter Server 2003	4816-1BX	IBM	1	32,995	1	32,995	41,850
Three-Year Maintenance for Software	PROPRORS16U01	Microsoft	4	1,950	3		5,850
					Subtotal	$165,323	$47,700
Client Hardware							
IBM @server xSeries 220*	8646-5AX	IBM	1	1,409	6	$8,454	$4,488
One 256MB 133MHz ECC SDRAM							
1.4GHz/512KB Pentium III Processor	25P2090	IBM	1	699	6	4,194	0
256MB 133MHz ECC SDRAM RDIMM	10K0020	IBM	1	219	12	2,628	0
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	6	1,650	0
IBM 10/100 Dual-Port Server Adapter	06P4901	IBM	1	209	12	2,508	0
QLogic 2350 Fibre Channel-VI Adapter***	QLA2350-BK	QLogic	3	2,568	6	15,408	0
E54 15" (13.8" Viewable) Color Monitor*	633147N	IBM	1	139	6	834	540
					Subtotal	$35,676	$5,028
Client Software							
Microsoft Windows 2000 Server w/COM+	C11-00821	Microsoft	4	738	6	4,428	0
Microsoft Visual C++ Professional 6.0	048-00317	Microsoft	4	549	1	549	0
					Subtotal	$4,977	$0
User Connectivity							
SAN Fibre Channel 8-Port Switch*	2109S08	IBM	1	16,518	1	16,518	2,160
IBM 5M LC-LC Fibre Channel Cable	19K1248	IBM	1	129	8	1,032	0
					Subtotal	$17,550	$2,160
					Total	$692,479	$66,118
Large volume discount of 14% on IBM Hardware; prices will vary if purchased separately. See Microsoft quote for software discount.			1			(83,798)	$0

Notes: * The standard 3-year warranties on IBM hardware have been upgraded to 7x24, 4-hour response time coverage.
** Five-year warranty. *** 10% or minimum 2 spares are added in place of on-site service (products have a 5-year return-to-vendor-warranty)
Pricing: 1 - IBM Corp.; 2 - Computer Giants; 3 - QLogic; 4 - Microsoft Corp.
Audited by Brad Askins of InfoSizing, Inc.

Three-Year Cost of Ownership:	$758,597
tpmC Rating:	112,740.87
$ / tpmC:	$6.73

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 specification. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Numerical Quantities Summary

MQTh, Computed Maximum Qualified Throughput:	112,740.87 tpmC

Response Times (in seconds)	Average	Maximum	90 %-tile
New-Order	0.42	6.19	0.85
Payment	0.36	4.37	0.79
Delivery	0.22	1.89	0.51
Stock Level	0.69	6.49	1.16
Order Status	0.37	9.26	0.79
Delivery (Deferred)	0.16	3.94	0.22
Menu	0.22	3.57	0.52

Transaction Mix (in percent of total transactions)	Total Occurrences	Percent
New-Order	13,528,904	44.95
Payment	12,949,592	43.03
Delivery	1,206,632	4.01
Stock-Level	1,204,674	4.00
Order Status	1,205,427	4.01

Emulation Delay (in seconds)		Response Time	Menu
New-Order		0.1	0.1
Payment		0.1	0.1
Delivery		0.1	0.1
Stock-Level		0.1	0.1
Order Status		0.1	0.1

Keying/Think Times (in seconds)	Average	Minimum	Maximum
New Order	18.01 / 12.05	18.00 / 0.00	18.06 / 120.51
Payment	3.02 / 12.05	3.00 / 0.00	3.05 / 120.51
Delivery	2.01 / 5.05	2.00 / 0.00	2.04 / 50.51
Stock Level	2.01 / 5.06	2.00/ 0.00	2.04 / 50.51
Order Status	2.01 / 10.04	2.00/ 0.00	2.04 / 100.51

Test Duration	
Ramp-up time	55 minutes 45 seconds
Measurement interval	120 minutes
Number of transactions (all types) completed in measurement interval	31,301,848
Ramp-down time	4 minutes 23 seconds
Number of checkpoints in measurement interval	4
Checkpoint interval	30 minutes