IBM	**IBM @server xSeries 250** **with** **Microsoft SQL Server 2000**	TPC-H Rev 1.3.0
		Report Date: Mar. 23, 2001

Total System Cost	Composite Query-per-Hour Metric	Price/Performance
$193,958	**1147.9** QphH @ 100GB	**$169** per QphH@100GB

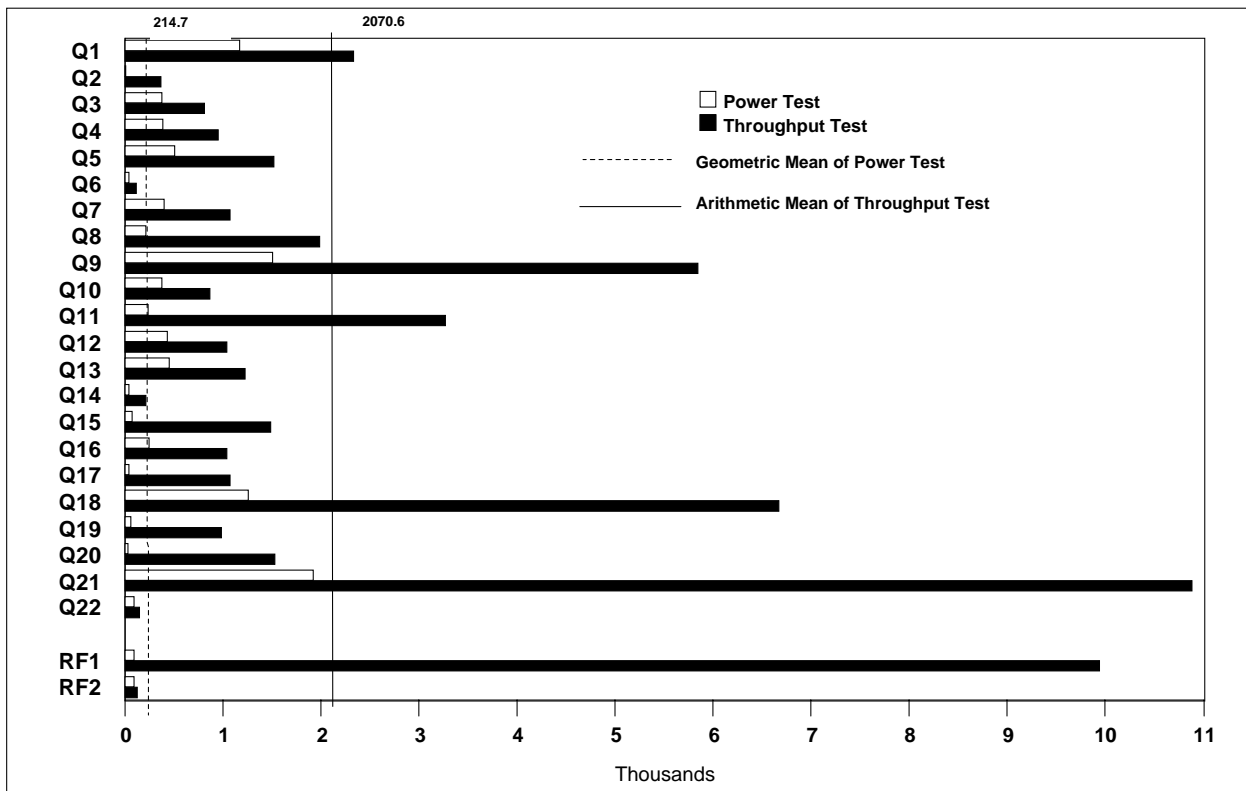| Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	**Microsoft SQL Server 2000 Enterprise Edition**	**Microsoft Windows 2000 Advanced Server**	**Visual Studio Professional 6.0**	**April 13, 2001**

Chart legend:
- □ Power Test
- ■ Throughput Test
- ---- Geometric Mean of Power Test
- —— Arithmetic Mean of Throughput Test

(Values 214.7 and 2070.6 marked. Queries Q1–Q22, RF1, RF2. X-axis: Thousands, 0 to 11)

Database Load Time: 07:29:59	**Load Included Backup: Y**	**Total Data Storage / Database Size: 10.25**

RAID (Base Tables Only): N	**RAID (Base Tables and Auxiliary Data Structures): N**	**RAID (All): N**

Configuration		
Processors	**4**	**Intel Pentium III Xeon 900MHz / 2MB L2 Cache**
Memory	**4**	**1GB SDRAM ECC RDIMM II**
Disk Controllers	**5**	**Mylex eXtremeRAID 2000 Adapter**
Disk Drives	**121**	**9.1GB 15K Ultra160 SCSI Drive**
Total Disk Storage		**1024.87GB**

	IBM @server xSeries 250 Microsoft SQL Server 2000	TPC-H Revision 1.3.0
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Description	Part Number	Source	Unit Price	Qty	Ext. Price	5-Yr. Maint.
Server Hardware						
xSeries 250 / 900MHz/2MB L2 Cache Pentium III Xeon	8665-8RY	1	11,203	1	11,203	10,295
900MHz / 2MB L2 Cache Processor	19K4635	1	6,599	3	19,797	0
1GB SDRAM ECC RDIMM II	33L3119	4	2,320	4	9,280	0
Mylex eXtremeRAID 2000 Adapter*	E2000-4-32NB	3	1,872	7	13,104	0
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	4	99	18	1,782	0
250W Hot-Swap Redundant Power Supply	37L3760	1	299	1	299	0
E54 15" (13.8" Viewable) Color Monitor	6331N2N	4	165	1	165	270
Netfinity Rack	9306900	4	1,580	1	1,580	1,308
Side Panel Kit	94G6669	4	179	1	179	0
			Subtotal		$57,389	$11,873
Server Storage						
Netfinity EXP300 Rack Storage Expansion Enclosure	35311RU	4	2,858	9	25,722	7,074
Netfinity 9.1GB 15K Ultra160 SCSI Drive	19K0655	4	538	121	65,098	0
			Subtotal		$90,820	$7,074
Server Software						
Microsoft SQL Server 2000 Enterprise Edition	810-00652	2	5,549	1	5,549	10,475
Microsoft SQL Server 2000 Client Licenses	359-00532	2	7,300	1	7,300	InclAbove
Microsoft Windows 2000 Advanced Server	C10-00475	2	2,399	1	2,399	InclAbove
Visual Studio Professional 6.0 Win32	659-00390	2	1,079	1	1,079	InclAbove
			Subtotal		$16,327	$10,475
			Total		$164,536	$29,422

Notes: Standard 3-Year and extended warranties upgraded to 7x24, 4-hour response time coverage. *10% or minimum 2 spares are added in place of on-site service; product has a 5-year return-to-vendor warranty. **Pricing:** 1 - IBM List Price; 2 - Microsoft Corp.; 3 - Mylex; 4 -SHI **Audited by Brad Askins of InfoSizing, Inc.**	**5-Year Cost of Ownership:** **$193,958**
	QphH @ 100GB: **1147.9**
	$ / QphH @ 100GB: **$169**

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	10.25
Start of Database Load	08:13:11
End of Database Load	15:43:10
Database Load Time	07:29:59
Query Streams for Throughput Test	5
TPC-H Power	1676.5
TPC-H Throughput	785.9
TPC-H Composite Query-per-Hour (QphH@100GB)	1,147.9
Total System Price over 5 Years	$193,958
TPC-H Price/Performance Metric ($/QphH@100GB)	$169

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 50,385 seconds

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
Stream 00	311154310	03/12/01 11:16:45	03/12/01 11:15:00	03/12/01 14:04:32	02:51:16
		03/12/01 14:04:31	03/12/01 11:16:40	03/12/01 14:06:16	
Stream 01	311154311	03/12/01 14:06:18	03/12/01 14:06:18	03/13/01 03:46:05	13:37:54
		03/13/01 03:44:12	03/13/01 03:46:01	03/13/01 03:48:18	
Stream 02	311154312	03/12/01 14:06:18	03/13/01 03:48:19	03/13/01 03:50:36	12:35:31
		03/13/01 02:41:49	03/13/01 03:50:34	03/13/01 03:52:52	
Stream 03	311154313	03/12/01 14:06:18	03/13/01 03:52:54	03/13/01 03:55:11	13:00:38
		03/13/01 03:06:56	03/13/01 03:55:10	03/13/01 03:57:25	
Stream 04	311154314	03/12/01 14:06:18	03/13/01 03:57:27	03/13/01 03:59:46	12:38:48
		03/13/01 02:45:07	03/13/01 03:59:45	03/13/01 04:01:52	
Stream 05	311154315	03/12/01 14:06:19	03/13/01 04:01:54	03/13/01 04:04:00	11:23:19
		03/13/01 01:29:38	03/13/01 04:03:59	03/13/01 04:06:03	

TPC-H Timing Intervals (in seconds):

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	1,182.2	21.2	382.5	395.0	519.8	50.3	404.9	221.8	1,518.9	382.7	248.0	434.9
Stream 01	1,165.3	300.4	932.7	399.7	1,423.5	153.8	1,211.3	5,226.5	4,720.7	815.2	1,804.1	936.6
Stream 02	2,167.7	373.6	1,021.4	942.7	1,593.1	170.1	1,258.9	557.0	6,980.2	915.7	3,178.1	1,163.3
Stream 03	3,014.4	295.9	502.2	1,043.2	1,519.8	97.9	1,025.2	3,183.0	6,863.8	910.9	4,650.8	551.9
Stream 04	2,775.6	455.3	739.5	1,437.5	1,698.8	105.2	960.1	579.3	7,062.4	943.3	4,134.6	992.8
Stream 05	2,557.5	459.1	880.6	968.5	1,392.1	105.0	928.6	399.9	3,610.1	789.3	2,582.5	1,579.8
Minimum	1,165.3	295.9	502.2	399.7	1,392.1	97.9	960.1	399.9	3,610.1	789.3	1,804.1	551.9
Average	2,336.1	376.9	815.3	958.3	1,525.5	126.4	1,076.8	1,989.1	5,847.4	874.9	3,270.0	1,044.9
Maximum	3,014.4	459.1	1,021.4	1,437.5	1,698.8	170.1	1,258.9	5,226.5	7,062.4	943.3	4,650.8	1,579.8

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	460.7	51.6	81.6	260.5	45.7	1,266.2	74.1	37.1	1,923.1	103.1	100.1	103.8
Stream 01	2,090.5	195.8	1,548.7	792.2	829.6	7,405.0	514.0	6,070.6	10,434.8	103.4	49,183.2	132.7
Stream 02	1,074.4	254.2	1,518.6	2,001.5	1,046.1	5,875.8	2,185.6	253.9	10,240.9	198.2	135.4	136.0
Stream 03	744.7	253.2	1,579.8	322.3	1,378.1	7,383.9	398.4	354.7	10,594.4	169.5	136.0	134.5
Stream 04	1,306.2	323.7	1,529.0	610.1	294.0	5,970.2	934.4	908.0	11,564.4	203.6	137.9	126.0
Stream 05	922.0	109.9	1,263.4	1,500.6	1,504.0	6,729.9	915.0	76.7	11,587.9	136.9	124.6	123.0
Minimum	744.7	109.9	1,263.4	322.3	294.0	5,875.8	398.4	76.7	10,240.9	103.4	124.6	123.0
Average	1,227.6	227.4	1,487.9	1,045.3	1,082.4	6,673.0	989.5	1,532.8	10,884.5	162.3	9,943.4	130.4
Maximum	2,090.5	323.7	1,579.8	2,001.5	1,504.0	7,405.0	2,185.6	6,070.6	11,587.9	203.6	49,183.2	136.0