

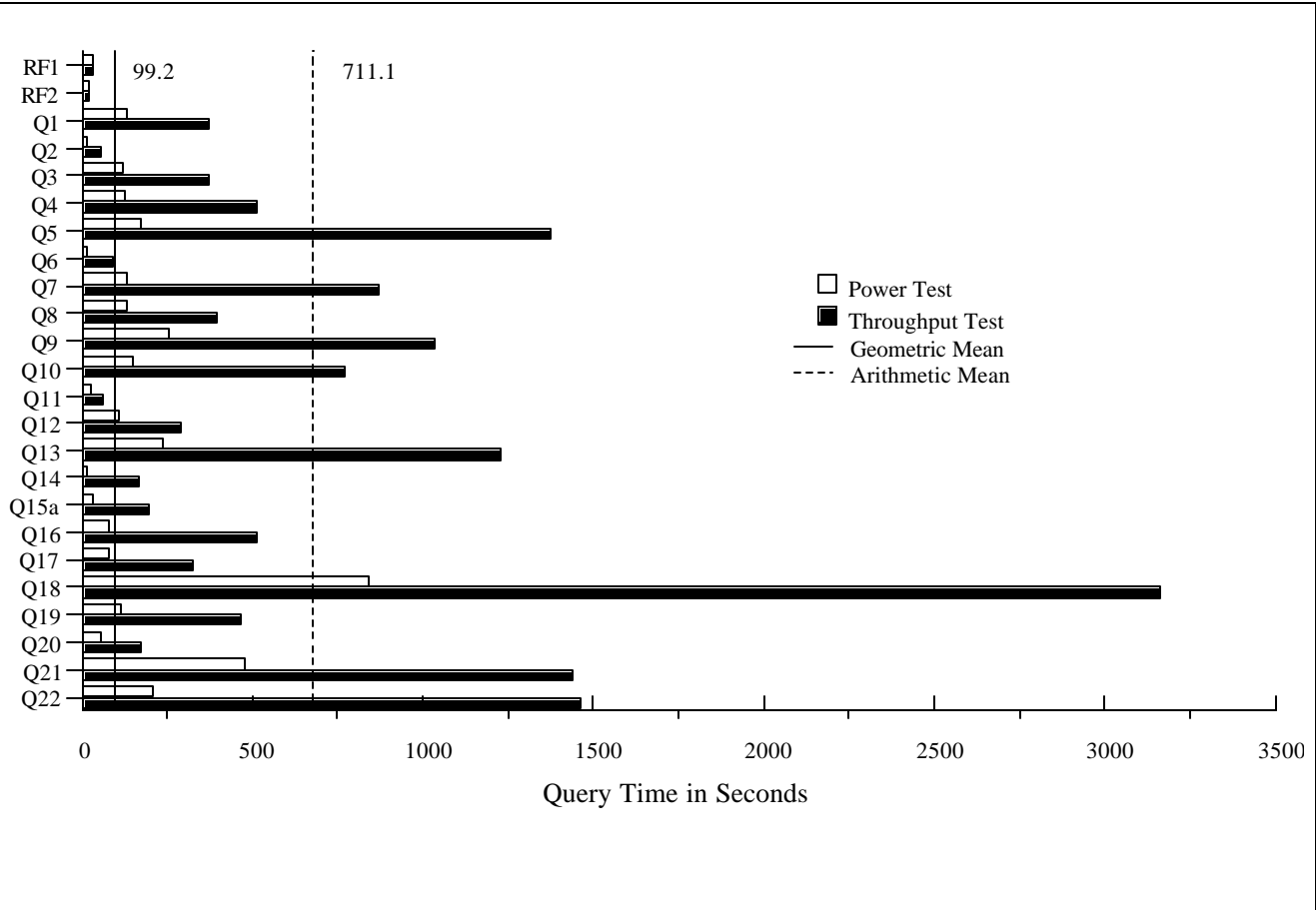


IBM @server x350 with DB2 UDB 7.2

TPC-H Rev. 1.3.0

Report Date:
February 1, 2002

Total System Cost	Composite Query per Hour Rating	Price/Performance
\$996,606	2960.6 QphH@100GB	\$337 \$/QphH@100GB
Database Size	Database Manager	Operating System
100GB	DB2 UDB 7.2	Turbolinux 7 server
	Other Software	Availability Date
	none	June 20, 2002



Database Load Time: 1:55:53 Load included backup: N Total Data Storage/Database Size: 44.72

RAID (base tables): N RAID (Base Tables and Auxiliary Data Structures): Y RAID (All): N

System Components

4 IBM @server x350 servers, each server with

- Processors** 4 x 900MHz Intel Pentium 3 Xeon 2 MB L2Cache
- Memory** 4 GB
- Disk Controllers** 5 Netfinity FAStT Host Adapter
- Disk Drives** 63 x 18.2 GB 15K RPM FAStT200 (external 16.95 GB raw capacity)
3 x 18.2 GB SCSI(internal formatted size 16.68 GB)
- Total Disk Storage** 4471.72 GB (GB is defined as 1024 * 1024 * 1024 bytes)
- Network** (4) IBM Gigabit Ethernet SX Server Adapter



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Description	Part Number	Third Party	Unit Price	Qty	Extended Price	5 Yr. Maint. Price	
		Brand	Pricing				
Server Hardware							
IBM eServer x350	86826RY		1	8,199	4	\$32,796	
900MHz / 2MB Processor Upgrade	19K4633		1	6,189	12	74,268	
1GB SDRAM ECC RDIMM II	33L3119		1	989	16	15,824	
18.2GB Ultra160 10K rpm SCSI Drive	37L7205		1	275	12	3,300	
FAStT 500 Host Adapter	00N6881		1	1,485	20	29,700	
Gigabit Ethernet SX Adapter	06P3701		1	635	4	2,540	
E54 15" (13.8" Viewable) Color Monitor	633147N		1	149	4	596	
Cisco Catalyst 3508G 8-Port 1000BASE-TX/FX Switch	184834		3	3,639	1	3,639	
Cisco Single-Port 1000BASE-T Gigabit GBIC	266611		3	299	4	1,196	
Subtotal						\$162,663	\$33,882
Server Storage							
IBM FAStT EXP500 Storage Exp. Enclosure	35601RU		1	3,815	20	76,300	
IBM FAStT200 Storage Server	35421RU		1	9,999	20	199,980	
18.2GB 15K Fibre Channel Disk Drive	06P5707		1	619	240	148,560	
IBM NetBAY42 Enterprise Rack	9306421		1	1,610	4	6,440	
Subtotal						\$431,280	\$60,032
Server Software							
TurboLinux 7 Server (5 Server License Pack)	7SCLP1		2	1,150	1	1,150	
TurboSupport- 5 years 4 Hour response	TSP072		2	19,230	1	19,230	
TurboSupport- 5 years Additional Machine	TSP073		2	6,920	3	20,760	
DB2 UDB EEE License / 1yr maint / proc	D5B5RLL		1	18,745	16	299,920	
DB2 UDB EEE Maint renew (/proc / year)	E1B5ULL		1	915	64	58,560	
Subtotal						\$301,070	\$98,550
Total						\$895,013	\$192,464
Large volume discount of 20% on TurboLinux; prices will vary if purchased separately.						20%	(\$8,228)
Large volume discount of 14% on IBM hardware; prices will vary if purchased separately.						14%	(82,643)
Five-Year Cost of Ownership:						\$996,606	
Pricing: 1 - IBM list price 2 - TurboLinux - 3 CDW.COM					QpH:	2960.6	
Warranty: The standard 3-year warranty has been upgraded to 7x24, 4-hour response time. Additional two years are for 7x24, 4-hour response time.					\$/QpH:	\$337.00	
Audited by Francois Raab of InfoSizing, Inc.							
<small>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 prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.</small>							

Note: Hardware immediately available. OS and database software available June 20, 2001.

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Numerical Quantities Summary

Measurement Results:

Database Scaling (SF/Size)	=	100
Total Data Storage/Database Size	=	44.72
Database Load Time	=	1:55:53
Query Streams for Throughput Test	=	5
TPC-H Power Metric (QppH@100GB)	=	3,627.4
TPC-H Throughput Metric (QthH@100GB)	=	2,416.4
Composite Query-per-Hour Rating (QphH@100GB)	=	2,960.6
Total System Price over 5 years	=	\$996,606
TPC-H Price/Performance Metric (\$/QphH@100GB)	=	\$337

Measurement Intervals

Measurement Interval in Throughput Test (TS) = 16388 seconds

Duration of Stream Execution

<u>Stream ID</u>	<u>Seed Used</u>	<u>Start Date</u>	<u>Start Time</u>	<u>End Date</u>	<u>End Time</u>
Stream 00	120154159	01/20/02	15:57:59	01/20/02	17:00:07
Stream 01	120154160	01/20/02	17:00:44	01/20/02	21:20:55
Stream 02	120154161	01/20/02	17:00:44	01/20/02	21:25:08
Stream 03	120154162	01/20/02	17:00:44	01/20/02	21:11:00
Stream 04	120154163	01/20/02	17:00:44	01/20/02	21:27:43
Stream 05	120154164	01/20/02	17:00:44	01/20/02	21:22:33
Refresh		02/20/02	17:00:44	01/20/02	21:33:51



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Timing Intervals (in Seconds)

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 0	142.8	20.5	127.0	132.1	181.1	20.0	136.9	138.3	262.1	159.6	31.7	114.9
Stream 01	394.9	69.8	479.2	488.1	1270.2	40.6	468.8	429.6	592.6	1095.6	52.1	467.7
Stream 02	380.6	41.3	270.9	306.1	1743.1	91.8	1008.2	528.4	757.0	1233.7	133.7	275.9
Stream 03	521.3	119.2	395.4	474.5	1468.3	201.6	851.5	598.0	957.0	398.6	60.7	236.5
Stream 04	557.8	29.0	223.2	688.8	1456.7	63.0	880.8	188.4	1741.6	556.7	48.1	323.2
Stream 05	445.4	58.1	534.9	630.3	980.7	112.5	1171.6	274.4	1155.7	603.8	59.2	192.7
Minimum	380.6	29.0	223.2	306.1	980.7	40.6	468.8	188.4	592.6	398.6	48.1	192.7
Average	460.0	63.5	380.7	517.6	1383.8	101.9	876.2	403.8	1040.8	777.7	70.8	299.2
Maximum	557.8	119.2	534.9	688.8	1743.1	201.6	1171.6	598.0	1741.6	1233.7	133.7	467.7
Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	247.0	25.4	38.7	88.6	87.7	850.0	119.5	60.9	486.0	212.6	43.6	30.9
Stream 01	1083.4	172.1	179.1	492.9	245.5	3964.5	435.3	147.8	1455.4	1586.4	42.7	30.3
Stream 02	966.7	216.3	251.0	722.9	465.2	3556.6	691.3	115.3	1019.9	1088.2	43.8	29.3
Stream 03	1315.7	250.5	170.9	461.1	442.2	2093.9	379.4	474.4	1627.1	1252.8	44.1	29.5
Stream 04	1461.4	113.9	164.0	334.6	229.3	3023.5	410.6	58.7	1719.1	1747.5	44.3	30.4
Stream 05	1342.6	122.1	267.3	575.7	276.8	3219.8	453.9	105.3	1455.1	1672.3	43.6	29.9
Minimum	966.7	113.9	164.0	334.6	229.3	2093.9	379.4	58.7	1019.9	1088.2	42.7	29.3
Average	1234.0	175.0	206.5	517.4	331.8	3171.7	474.1	180.3	1455.3	1469.4	43.7	29.9
Maximum	1461.4	250.5	267.3	722.9	465.2	3964.5	691.3	474.4	1719.1	1747.5	44.3	30.4