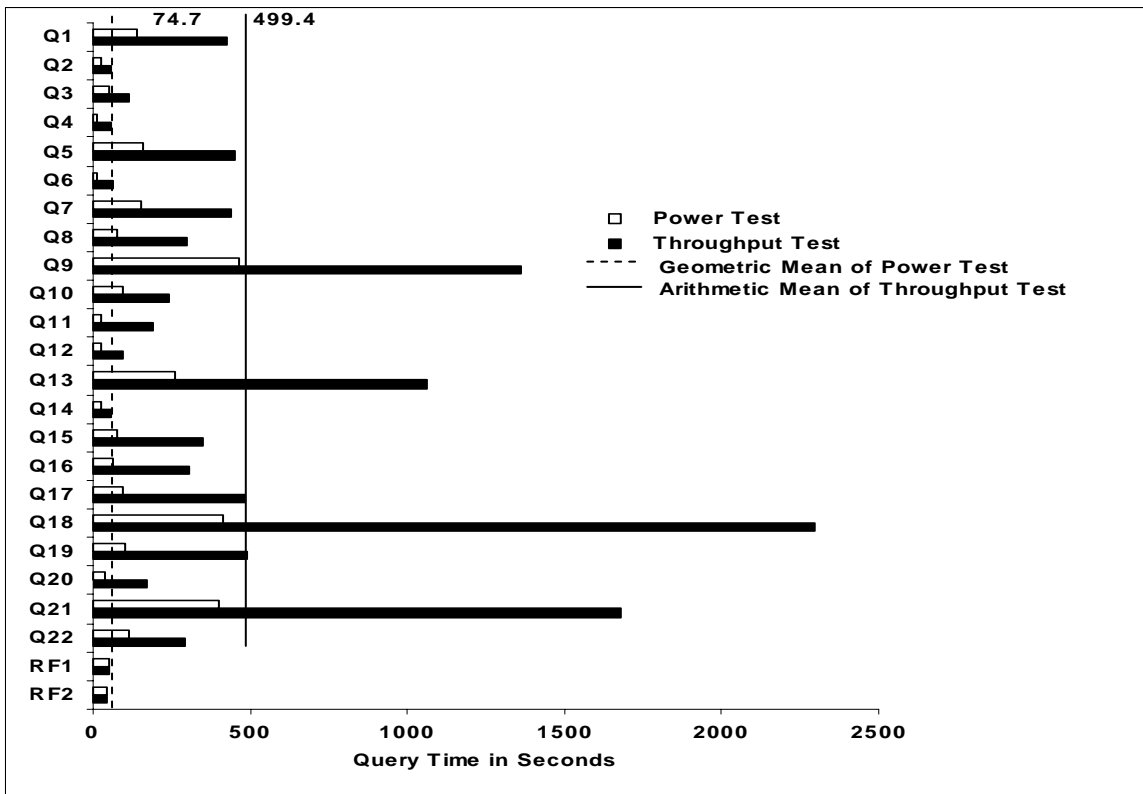
	IBM® @server™ 325 with IBM DB2® UDB 8.1	TPC-H Revision 2.0	
		Report Date: July 29, 2003	
Total System Cost	Composite Query-per-hour Metric	Price/Performance	
863,410	13194.9 QphH@300GB	\$65 per QphH@300GB	
Database Size	Database Manager	Operating System	Availability Date
300GB	IBM DB2 UDB 8.1	SuSE Linux Enterprise Server 8	November 8, 2003



Database Load Time: 01:16:52	Load Included Backup: N	Total Data Storage / Database Size: 19.44
RAID (Base Table): Y	RAID (Base Tables and Auxiliary Data Structures): Y	RAID (ALL): Y

System Configuration: 8 nodes

- Processors: **2 x 2GHz AMD 64-bit Opteron Model 246 processor**
- Memory: **6 x DIMMS 1GB ECC 2700 2.5 CL**
- Disk Controllers: **1 x QLA2342 HBA (2 ports x 2G bps FC)**
1 x IBM FC2-133 HBA (1 ports x 2G bps FC)
- Disk Drives: **3 (IBM TotalStorage FAStT EXP700 cases) × 14 (15K FC Hot-Swap Drive) × 18.2 GB**
1 × 18.2GB 15K Ultra160 SCSI Hot-Swap Drive

Total Disk Storage: 5831.06 GB



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Description	Part #	Source	Unit Price	Qty	Extended Price	3-Yr. Maint. Price
					Price	Price
Server Hardware						
IBM e(logo)server 325 w/2GHz AMD 246	8835-51X		1 3,039	8	24,312	6968
2GHz Opteron Processor Upgrade	13N0700		1 1,399	8	11,192	0
DIMMS 1GB ECC 2700 2.5 CL	73P2267		1 659	48	31,632	0
Cisco Catalyst 3508G XL Enterprise edition	184837		3 3,600	1	3,600	1,223
Cisco 1000BASE-T Gigabit GBIC Module	372656		3 299	8	2,393	
18.2GB 15K Ultra160 SCSI Hot-Swap Drive	06P5767		1 329	8	2,632	0
IBM FC2-133 Host Bus Adapter	24P0960		1 1,485	8	11,880	0
Qlogic QLA 2342 Host Bus Adapter	408082		3 2,291	8	18,328	0
IBM USB Keyboard w/2 port USB Hub	22P5185		1 45	1	45	
IBM USB Optical Wheel Mouse	06P4069		1 20	1	20	
APC Smart-UPS Model 1400	32P1020		1 855	1	855	0
E54 15" (13.8" Viewable) Color Monitor	633147N		1 129	1	129	90
NetBAY42S Enterprise Rack	9306421		1 1,439	4	5,756	300
				Subtotal	112,774	8581
Server Storage						
IBM TOTALSTORAGE FASTT EXP700	1740-1RU		1 3,000	24	72,000	17,280
18.2GB 15K FC Hot-Swap Drive	5211		1 681	336	228,816	
Short Wave SFP	2210		1 499	24	11,976	
1M LC-LC FIBRE OPTIC CABLE	5601		1 79	24	1,896	
				Subtotal	300,816	17,280
Server Software						
DB2 UDB ESE V8.1 License/1-yr. Maint.	D518GLL		1 20,451	16	327,216	
DB2 UDB ESE V8.1 Support – 1Yr/Proc	E00BILL		1 974	32		31,168
DB2 UDB ESE V8.1 DPF License/1-yr. Maint.	D518JLL		1 6,143	16	98,288	
DB2 UDB ESE V8.1 DPF Support – 1Yr/Proc	E00BJLL		1 293	32		9,376
SuSE SLES8 8 proc + 1 yr maint.	2119-3INT-8		2 2,585	1	2,585	
SuSE SLES 8 Main. 1 yr/8proc	2119-MFJ-8		2 2,456	4		9,824
				Subtotal	428,089	50,368
Large volume discount on IBM hardware of 14%; prices vary if purchased separately.14%				Discount	54,498	
				Total	787,181	76,229
Three-Year Cost of Ownership:						863,410
Pricing: 1 - IBM Business Partner; 2 - SuSE, 3 - CDW shop online Warranty and Maintenance: The standard warranty has been upgraded to 3 years of 24x7x4 coverage.					QphH:	13194.9
					\$/QphH:	\$65
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® @server™ 325
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Measurement Results:

Database Scale Factor	300
Total Data Storage/Database Size	19.44
Start of Database Load	15:52:26
End of Database Load	17:09:18
Database Load Time	01:16:52
Query Streams for Throughput Test	6
TPC-H Power	14457.5
TPC-H Throughput	12042.6
TPC-H Composite Query-per-Hour (QphH@300GB)	13194.9
Total System Price over 3 Years	863,410
TPC-H Price/Performance Metric (\$/QphH@300GB)	65

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 11838 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	727170918	07/27/03 22:03:30	07/27/03 22:02:40	07/27/03 22:50:30	00:48:36
		07/27/03 22:50:30	07/27/03 22:03:30	07/27/03 22:51:15	
Stream 01	727170919	07/27/03 22:51:20	07/28/03 01:59:11	07/28/03 02:00:06	03:07:51
		07/28/03 01:59:11	07/28/03 02:00:06	07/28/03 02:00:53	
Stream 02	727170920	07/27/03 22:51:21	07/28/03 02:00:53	07/28/03 02:01:45	03:06:53
		07/28/03 01:58:14	07/28/03 02:01:45	07/28/03 02:02:32	
Stream 03	727170921	07/27/03 22:51:20	07/28/03 02:02:32	07/28/03 02:03:21	03:02:32
		07/28/03 01:53:52	07/28/03 02:03:21	07/28/03 02:04:05	
Stream 04	727170922	07/27/03 22:51:21	07/28/03 02:04:05	07/28/03 02:04:54	03:01:52
		07/28/03 01:53:13	07/28/03 02:04:54	07/28/03 02:05:37	
Stream 05	727170923	07/27/03 22:51:21	07/28/03 02:05:37	07/28/03 02:06:25	03:00:18
		07/28/03 01:51:39	07/28/03 02:04:54	07/28/03 02:07:08	
Stream 06	727170924	07/27/03 22:51:22	07/28/03 02:07:08	07/28/03 02:07:55	02:59:16
		07/28/03 01:50:38	07/28/03 02:07:55	07/28/03 02:08:39	



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TPC-H Timing Intervals (in seconds):

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	139.4	25.1	52.6	15.1	160.5	15.5	151.0	73.7	465.8	94.1	24.9	27.1
Stream 01	179.7	67.8	95.2	16.4	423.1	69.8	530.4	291.2	1707.1	182.6	193.4	81.8
Stream 02	562.9	73.0	161.1	77.1	421.9	59.2	399.4	266.3	1683.2	244.1	187.9	87.9
Stream 03	510.9	49.5	82.8	83.3	445.4	70.1	350.5	388.3	1161.0	181.3	237.6	74.6
Stream 04	501.6	50.9	124.9	43.4	502.7	58.1	496.2	276.6	1213.1	254.3	249.4	106.2
Stream 05	383.3	53.3	109.5	52.0	463.7	60.2	462.1	287.4	1232.8	246.4	161.7	108.5
Stream 06	425.2	55.9	101.5	52.8	469.8	59.1	389.7	273.6	1165.1	337.9	130.4	119.8
Minimum	179.7	49.5	82.8	16.4	421.9	58.1	350.5	266.3	1161.0	181.3	130.4	74.6
Average	427.3	58.4	112.5	54.2	454.4	62.8	438.1	297.2	1360.4	241.1	193.4	96.5
Maximum	562.9	73.0	161.1	83.3	502.7	70.1	530.4	388.3	1707.1	337.9	249.4	119.8

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	259.6	23.8	74.2	63.2	93.5	415.6	100.6	35.4	397.9	111.4	50.1	45.0
Stream 01	1195.4	52.5	426.3	251.0	413.0	2346.5	537.5	174.6	1880.2	155.6	55.0	47.0
Stream 02	1039.1	55.7	319.8	384.2	489.6	2425.4	619.7	257.2	985.5	413.0	51.5	47.4
Stream 03	1010.0	58.1	419.8	300.9	570.2	2260.3	532.2	186.0	1590.0	389.2	48.5	44.5
Stream 04	1104.5	64.4	240.6	293.4	445.4	2230.3	374.0	94.5	1908.1	279.1	48.3	43.8
Stream 05	950.8	68.6	377.5	249.6	553.5	2275.6	488.6	157.8	1841.5	233.8	47.3	43.7
Stream 06	1075.9	48.0	307.9	352.1	423.1	2250.8	391.1	160.2	1869.4	296.9	46.4	43.6
Minimum	950.8	48.0	240.6	249.6	413.0	2230.3	374.0	94.5	985.5	155.6	46.4	43.6
Average	1062.6	57.9	348.7	305.2	482.5	2298.2	490.5	171.7	1679.1	294.6	49.5	45.0
Maximum	1195.4	68.6	426.3	384.2	570.2	2425.4	619.7	257.2	1908.1	413.0	55.0	47.4