

**IBM® @server® xSeries® 346
with
IBM DB2® UDB 8.2**

TPC-H Rev 2.1.0

Report Date: Dec. 14, 2004

Total System Cost

Composite Query-per-Hour Metric

Price/Performance

\$26,536 USD

**1,894.2
QphH @ 100GB**

**\$14 USD
per QphH @ 100GB**

Database Size

Database Manager

Operating System

Other Software

Availability Date

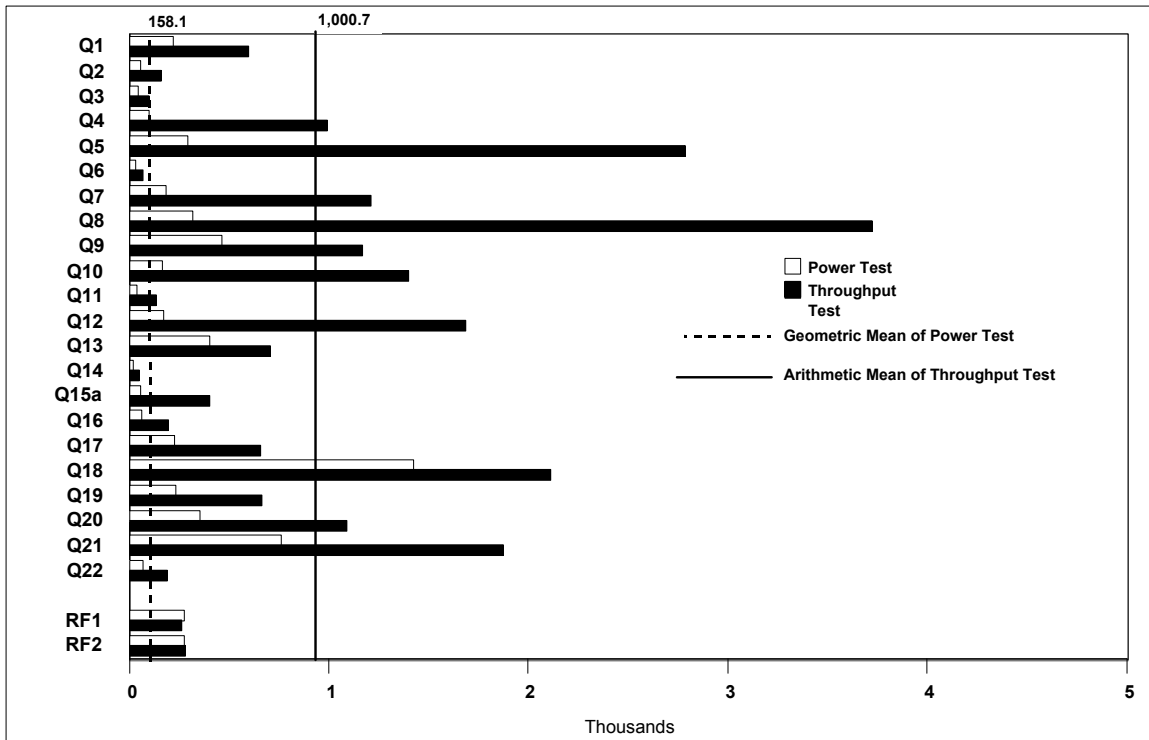
100GB

IBM DB2 UDB 8.2

**SUSE®
Linux® Enterprise
Server 9**

None

Dec. 14, 2004



Database Load Time: 04:07:28

Load Included Backup: Y

Total Data Storage / Database Size: 6.78

RAID (Base Tables Only): N

RAID (Base Tables and Auxiliary Data Structures): N

RAID (All): N

Configuration

Processors

2

Intel Xeon 3.6GHz / 1MB L2 Cache

Memory

4

1GB (2x512MB) PC-3200 DDR ECC SDRAM RDIMM

Disk Controllers

1

ServeRAID-7k Ultra320 SCSI Embedded Interface

Disk Drives

20

36.4GB 15K Ultra320 SCSI Drive

Total Disk Storage

678GB



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TPC-H 2.1.0 Executive Summary

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Description	Part Number	Third Party Brand	Pricing	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware							
IBM e(Logo)server xSeries 346 w/3.6GHz Xeon w/1 x 3.6GHz/1MB Xeon MP Processors w/2 x 512MB ECC SDRAM RDIMMs Integrated Dual-Channel Gigabit Ethernet	8840-41U	IBM		3,559	1	3,559	
ServicePac for 3-Year 24x7x4 Support	21P2078	IBM		600	1		600
3.6GHz Xeon Processor Upgrade	13N0685	IBM		1,429	1	1,429	
1GB (2x512MB) PC-3200 DDR ECC SDRAM RDIMM	73P3522	IBM		399	3	1,197	
IBM ServeRAID-7K SCSI Controller	71P8642	IBM		449	1	449	
IBM Preferred Pro Full-Size Keyboard	31P7415	IBM		29	1	29	
IBM Sleek 2-Button Mouse	28L3673	IBM		15	1	15	
E54 15" (13.8" Viewable) Color Monitor	633147N	IBM		149	1	149	
ServicePac for 3-Year 24x7x4 Support	30L9183	IBM		90	1		90
					Subtotal	6,827	690
Server Storage							
IBM EXP400 Rack Storage Enclosure	17331RU	IBM		3,099	1	3,099	
ServicePac for 3-Year 24x7x4 Support	41L2768	IBM		760	1		760
36.4GB 15K U320 SCSI Drive	90P1318	IBM		349	20	6,980	
					Subtotal	10,079	760
Server Software							
DB2 Universal Database Express Edition Server Lic+SW Maint 12 Mo	D52BILL	IBM		624	1	624	
Server License Maintenance 12 Months		IBM		125	2		250
DB2 Universal Database Express Edition Server User Lic+SW Maint 12 Mo	D52BKLL	IBM		124	50	6,200	
User License Maintenance 12 Months		IBM		25	100		2,500
SUSE Linux Enterprise Server 9 2 CPU with 3 Yr Maint.		SUSE		870	1	870	
					Subtotal	7,694	2,750
Compsat Technology discount of 12.33%					Discount	2,090	174
					Total	22,510	4,026

Three-Year Cost of Ownership: 26,536

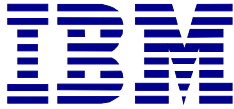
Pricing: 1 - Compsat Technology; 2 - Novell
Warranty and Maintenance: The standard warranty has been upgraded to 3 years of 24x7x4 coverage.

QphH@100GB: 1,894.2

\$USD/QphH@100GB: \$14

Audited by Francois Raab, InfoSizing, Inc.

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.



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Measurement Results:

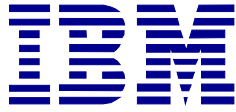
Database Scale Factor	100
Total Data Storage/Database Size	6.78
Start of Database Load	06:28:50
End of Database Load	10:36:18
Database Load Time	04:07:28
Query Streams for Throughput Test	5
TPC-H Power	2,277.7
TPC-H Throughput	1,575.2
TPC-H Composite Query-per-Hour (QphH@300GB)	1,894.2
Total System Price over 3 Years	\$26,536 USD
TPC-H Price/Performance Metric (\$/QphH@300GB)	\$14 USD

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 25,139

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	1205103618	12/05/04 14:11:47 12/05/04 15:47:06	12/05/04 14:07:10 12/05/04 14:11:47	12/05/04 15:47:06 12/05/04 15:51:43	1:35:19 0:09:14
Stream 01	1205103619	12/05/04 15:51:47 12/05/04 21:58:53	12/05/04 15:51:47 12/05/04 22:09:08	12/05/04 22:09:08 12/05/04 22:13:53	6:13:04 0:09:02
Stream 02	1205103620	12/05/04 15:51:47 12/05/04 22:02:31	12/05/04 22:13:53 12/05/04 22:18:23	12/05/04 22:18:23 12/05/04 22:23:09	6:10:44 0:09:16
Stream 03	1205103621	12/05/04 15:51:47 12/05/04 22:04:50	12/05/04 22:23:09 12/05/04 22:27:36	12/05/04 22:27:36 12/05/04 22:32:21	6:13:04 0:09:12
Stream 04	1205103622	12/05/04 15:51:47 12/05/04 21:58:02	12/05/04 22:32:21 12/05/04 22:36:50	12/05/04 22:36:50 12/05/04 22:41:32	6:06:14 0:09:11
Stream 05	1205103623	12/05/04 15:51:48 12/05/04 21:49:15	12/05/04 22:41:32 12/05/04 22:46:01	12/05/04 22:46:01 12/05/04 22:50:46	5:57:27 0:09:14



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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	221.7	56.5	46.8	98.5	296.1	33.4	188.4	316.7	465.6	167.3	40.9	173.9
Stream 01	557.1	163.9	130.1	1,338.3	3,661.4	73.7	522.1	4,330.1	1,190.3	893.5	70.8	1,527.6
Stream 02	880.5	148.9	172.9	1,771.2	1,902.0	104.6	866.4	3,518.8	1,355.3	1,717.1	120.5	1,719.2
Stream 03	318.1	277.8	45.9	734.6	2,537.3	37.7	842.5	5,600.2	821.6	929.3	335.7	1,286.4
Stream 04	842.5	142.1	102.0	562.7	3,988.3	49.6	2,125.0	2,491.9	866.8	1,432.9	95.9	1,199.1
Stream 05	410.8	85.5	59.9	578.4	1,847.8	74.0	1,715.1	2,680.2	1,617.5	2,047.0	47.0	2,719.9
Minimum	318.1	85.5	45.9	562.7	1,847.8	37.7	522.1	2,491.9	821.6	893.5	47.0	1,199.1
Average	601.8	163.6	102.2	997.0	2,787.4	67.9	1,214.2	3,724.2	1,170.3	1,404.0	134.0	1,690.4
Maximum	880.5	277.8	172.9	1,771.2	3,988.3	104.6	2,125.0	5,600.2	1,617.5	2,047.0	335.7	2,719.9

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	402.0	19.8	57.5	63.4	228.3	1,425.4	232.3	356.1	760.0	68.7	276.7	277.3
Stream 01	738.5	75.3	265.8	385.0	386.3	1,611.3	678.0	810.1	2,319.4	298.1	258.0	284.6
Stream 02	599.5	52.0	116.2	132.9	819.6	2,862.1	793.9	1,521.0	916.9	152.7	270.3	286.0
Stream 03	871.5	37.8	1,375.1	124.6	254.8	1,809.3	782.8	1,278.0	1,973.8	108.6	267.1	285.0
Stream 04	826.0	55.8	179.8	124.9	924.6	2,495.1	459.9	853.0	1,857.8	298.7	268.4	282.1
Stream 05	497.8	35.9	74.2	216.8	902.4	1,778.8	623.5	1,005.0	2,327.9	102.0	269.4	285.0
Minimum	497.8	39.9	74.2	124.6	254.8	1,611.3	459.9	810.1	916.9	102.0	258.0	282.1
Average	706.7	51.4	402.2	196.8	657.5	2,111.3	667.6	1,093.4	1,879.2	192.0	266.6	284.5
Maximum	871.5	75.3	1,375.1	385.0	924.6	2,862.1	793.9	1,521.0	2,327.9	298.7	270.3	286.0