

**IBM® @server® xSeries® 365  
with  
IBM DB2® UDB 8.2**

TPC-H Rev 2.1.0

Report Date: Oct. 26, 2004  
Amended: Feb. 8, 2005

Total System Cost

Composite Query-per-Hour Metric

Price/Performance

**\$233,410 USD**

**5,090.0  
QphH @ 300GB**

**\$46 USD  
per QphH @ 300GB**

Database Size

Database Manager

Operating System

Other Software

Availability Date

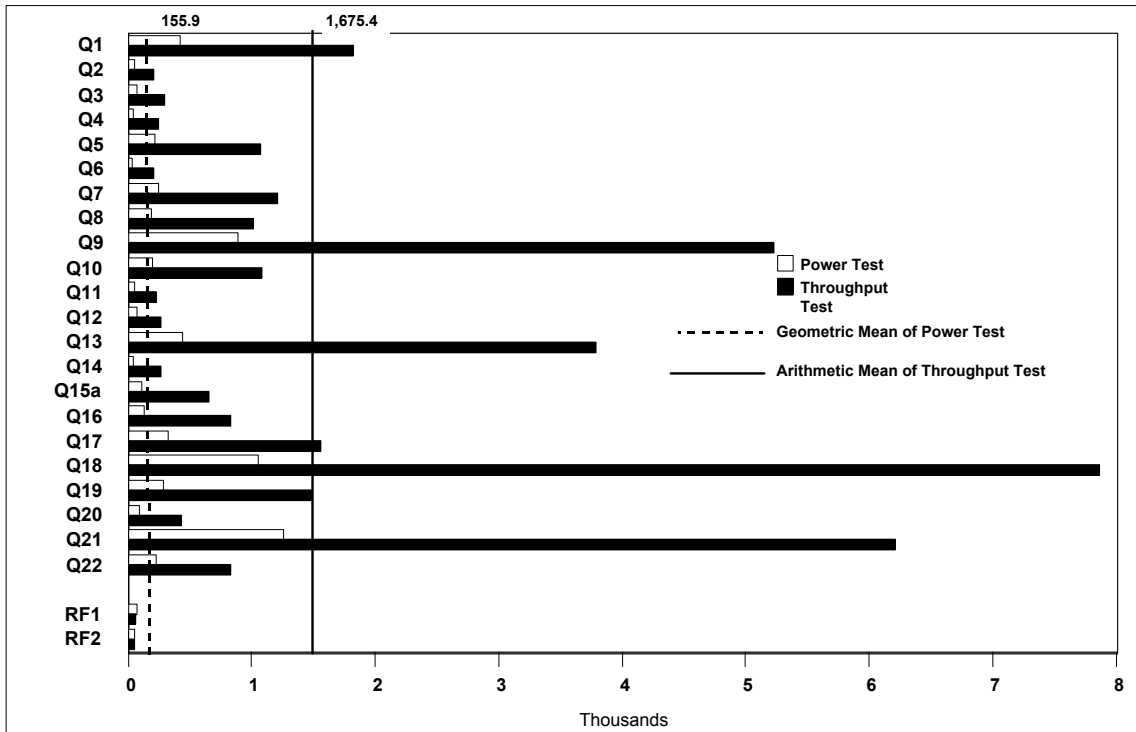
**300GB**

**IBM DB2 UDB 8.2**

**SUSE®  
Linux® Enterprise  
Server 9**

**None**

**Jan. 31, 2005**



Database Load Time: 04:59:16

Load Included Backup: Y

Total Data Storage /  
Database Size: 12.77

RAID (Base Tables Only): N

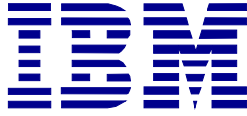
RAID (Base Tables and Auxiliary  
Data Structures): N

RAID (All): N

**Configuration**

Processors/Cores/Threads 4/4/8  
Memory 16  
Disk Controllers 4  
Disk Drives 112  
Total Disk Storage 1

Intel Xeon MP 3.0GHz / 4MB ECC L3 Cache  
1GB PC2100 DDR ECC SDRAM RDIMM  
ServeRAID-6M Ultra320 SCSI Adapter  
36.4GB 15K Ultra320 SCSI Drive  
36.4GB 15K Ultra320 SCSI Drive  
3830.7GB



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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
<b>Server Hardware</b>							
IBM e(logo)server xSeries 365 w/3.0GHz Xeon MP w/2 x 3.0GHz/4MB Xeon MP Processors w/4 x 512MB ECC SDRAM RDIMMs Integrated Dual-Channel Gigabit Ethernet	8862-6RX	IBM		15,599	1	15,599	
ServicePac for 3-Year 24x7x4 Support	96P2253	IBM		1,000	1		1,000
xSeries 3.0GHz/4MB Processor	13N0710	IBM		5,499	2	10,998	
1GB PC2100 DDR ECC SDRAM RDIMM	73P2031	IBM		619	16	9,904	
Memory Upgrade Card	73P9710	IBM		999	1	999	
36.4GB 15K Ultra320 SCSI Hot-Swap Drive	90P1318	IBM		349	1	349	
ServeRAID-6M Ultra320 SCSI Controller	32P0033	IBM		999	4	3,996	
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		119	1	119	
ServicePac for 3-Year 24x7x4 Support	30L9183	IBM		90	1		90
<b>Subtotal</b>						<b>42,008</b>	<b>1,090</b>
<b>Server Storage</b>							
IBM EXP400 Rack Storage Exp. Enclosure	17331RU	IBM		3,099	8	24,792	
ServicePac for 3-Year 24x7x4 Support	41L2768	IBM		760	8		6,080
36.4GB 15K Ultra320 SCSI Hot-Swap Drive	90P1318	IBM		349	112	39,088	
Netfinity 2M Ultra2 SCSI Cable	03K9310	IBM		75	8	600	
NetBAY4SX Rack	93074SX	IBM		1,489	1	1,489	
ServicePac for 3-Year 24x7x4 Support	41L2762	IBM		300	1		300
<b>Subtotal</b>						<b>65,969</b>	<b>6,380</b>
<b>Server Software</b>							
DB2 UDB ESE 8.2 SW Lic.& Maintenance 12 Months		IBM		22,260	4	89,040	
SW Maintenance Renewal - 1 Year		IBM		1,060	8		8,480
DPF SW License & Maintenance 12 Months		IBM		6,686	4	26,744	
DPF SW Maintenance Renewal - 1 Year		IBM		318	8		2,544
SUSE Linux Enterprise Server 9 Annual Upgr. License	874-002960-001	SUSE		899	3	2,697	
SUSE Linux Enterprise Server 9 24x7 Support - 1 Year	051-002673-001	SUSE		900	3		2,700
<b>Subtotal</b>						<b>118,481</b>	<b>13,724</b>
<b>Discount</b>						<b>13,345</b>	<b>897</b>
<b>Total</b>						<b>\$213,113</b>	<b>\$20,297</b>

**Three-Year Cost of Ownership USD: \$233,410**

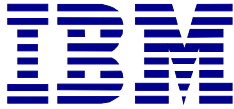
Pricing: 1 - Compsat Technology; 2 - IBM; 3 - Novell  
Warranty and Maintenance: The standard warranty has been upgraded to 3 years of 24x7x4 coverage.

**QphH@300GB: 5,090.0**

**USD/QphH@300GB: \$46**

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	300
Total Data Storage/Database Size	12:77
Start of Database Load	21:55:57
End of Database Load	02:55:13
Database Load Time	04:59:16
Query Streams for Throughput Test	6
TPC-H Power	6,926.5
TPC-H Throughput	3,740.4
TPC-H Composite Query-per-Hour (QphH@300GB)	5,090.0
Total System Price over 3 Years	\$233,410 USD
TPC-H Price/Performance Metric (\$/QphH@300GB)	\$46 USD

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 38,114

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
<b>Stream 00</b>	1009025513	10/09/04 04:03:34 10/09/04 05:53:17	10/09/04 04:03:34 10/09/04 04:04:43	10/09/04 05:52:28 10/09/04 05:53:17	1:49:43
<b>Stream 01</b>	1009025514	10/09/04 05:53:21 10/09/04 16:15:48	10/09/04 05:53:32 10/09/04 16:18:24	10/09/04 16:18:24 10/09/04 16:19:18	10:22:27
<b>Stream 02</b>	1009025515	10/09/04 05:53:21 10/09/04 15:42:35	10/09/04 16:19:18 10/09/04 16:20:13	10/09/04 16:20:13 10/09/04 16:21:08	9:49:15
<b>Stream 03</b>	1009025516	10/09/04 05:53:21 10/09/04 16:15:35	10/09/04 16:21:08 10/09/04 16:22:06	10/09/04 16:22:06 10/09/04 16:23:00	10:22:14
<b>Stream 04</b>	1009025517	10/09/04 05:53:21 10/09/04 16:17:18	10/09/04 16:23:00 10/09/04 16:23:58	10/09/04 16:23:58 10/09/04 16:24:51	10:23:57
<b>Stream 05</b>	1009025518	10/09/04 05:53:21 10/09/04 16:13:34	10/09/04 16:24:51 10/09/04 16:25:48	10/09/04 16:25:48 10/09/04 16:26:42	10:20:13
<b>Stream 06</b>	1009025519	10/09/04 05:53:21 10/09/04 16:01:03	10/09/04 16:26:42 10/09/04 16:27:41	10/09/04 16:27:41 10/09/04 16:28:35	10:08:42



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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	426.1	48.7	68.2	48.4	219.1	38.0	247.7	193.8	886.0	197.6	56.2	70.1
Stream 01	1,271.1	209.4	383.0	108.5	940.8	132.2	913.0	1,105.7	5,917.5	1,157.7	190.7	357.6
Stream 02	2,065.3	209.7	424.9	294.2	640.0	239.3	1,130.0	1,016.3	5,581.2	1,391.6	271.9	162.5
Stream 03	2,082.4	189.9	225.1	363.0	1,236.6	239.5	1,569.7	1,092.3	4,374.6	521.7	274.8	191.2
Stream 04	2,065.3	282.8	165.8	162.2	1,189.3	109.7	1,042.0	793.1	4,175.8	830.0	272.2	287.1
Stream 05	1,700.9	185.9	250.9	410.2	1,433.1	291.4	1,578.9	1,070.0	4,915.1	1,374.5	156.1	294.3
Stream 06	1,783.7	200.4	339.6	143.8	1,003.8	271.5	1,009.7	1,047.6	6,446.5	1,220.5	193.6	284.7
Minimum	426.1	48.7	68.2	48.4	219.1	38.0	247.7	193.8	886.0	197.6	56.2	70.1
Average	1,828.1	213.0	298.2	247.0	1,073.9	213.9	1,207.2	1,020.8	5,235.1	1,082.7	226.6	262.9
Maximum	2,082.4	282.8	424.9	410.2	1,433.1	291.4	1,578.9	1,105.7	6,446.5	1,391.6	274.8	357.6

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	438.8	39.9	109.9	129.0	330.0	1,054.0	284.5	96.6	1,257.0	225.7	68.6	48.9
Stream 01	2,390.7	337.7	643.9	578.1	1,446.3	9,322.7	1,726.0	335.2	6,935.2	944.4	66.0	54.2
Stream 02	2,982.7	280.4	706.4	1,103.9	2,048.3	6,163.1	1,885.7	488.0	5,498.4	770.7	55.2	54.4
Stream 03	3,818.1	188.6	495.0	760.7	1,830.7	9,179.1	1,135.0	564.8	6,158.0	843.6	58.1	54.0
Stream 04	7,476.5	259.6	674.5	828.0	1,206.6	6,581.4	1,300.5	113.0	6,911.1	710.4	57.9	53.0
Stream 05	2,584.1	284.8	755.5	671.4	1,491.2	8,076.5	1,311.2	554.2	6,922.7	900.3	57.4	54.1
Stream 06	3,519.2	281.9	674.1	1,064.7	1,347.3	7,881.5	1,554.0	515.2	4,864.0	815.1	58.4	54.7
Minimum	438.8	39.9	109.9	129.0	330.0	1,054.0	284.5	96.6	1,257.0	225.7	55.2	48.9
Average	3,795.2	272.2	658.2	834.5	1,561.7	7,867.4	1,485.4	428.4	6,214.9	830.8	58.8	54.1
Maximum	7,476.5	337.7	755.5	1,103.9	2,048.3	9,322.7	1,885.7	564.8	6,935.2	944.4	66.0	54.7