

**IBM® @server® xSeries® 366
with
IBM DB2® UDB 8.2**

TPC-H Rev 2.1.0

Report Date: April 21, 2005

Total System Cost

Composite Query-per-Hour Metric

Price/Performance

\$258,092 USD

**7,731.9
QphH @ 300GB**

**\$33 USD
per QphH @ 300GB**

Database Size

Database Manager

Operating System

Other Software

Availability Date

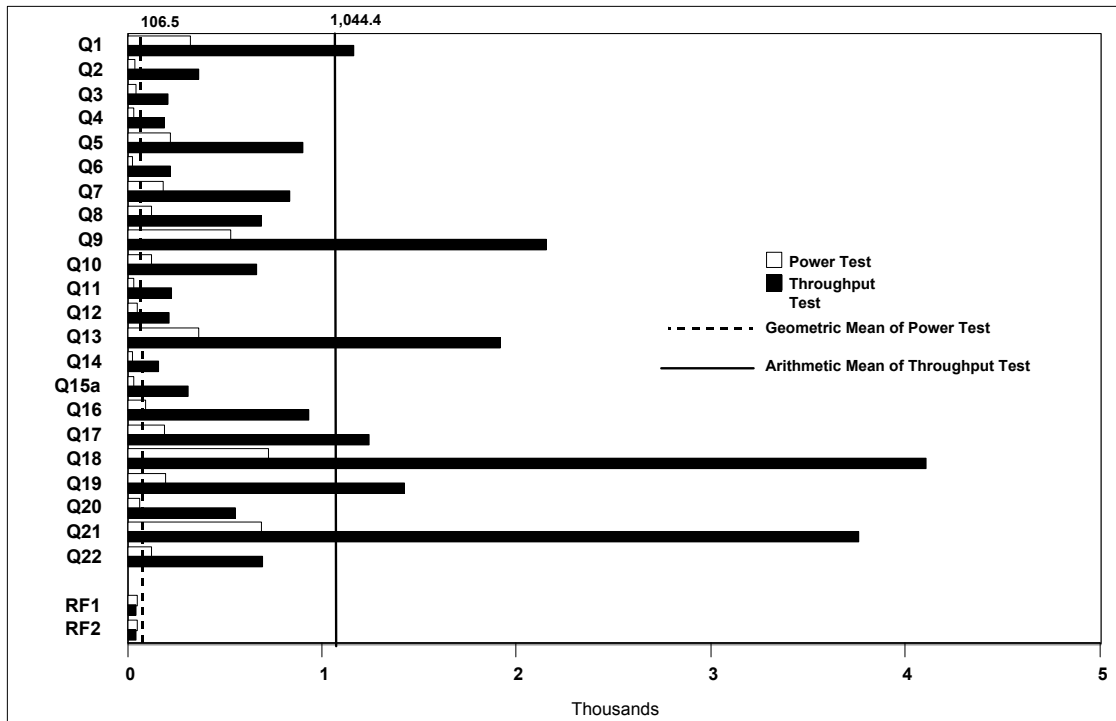
300GB

IBM DB2 UDB 8.2

**Microsoft®
Windows® Server
2003 Enterprise
Edition with QFE
834628**

**Microsoft
Visual C++
.NET
Standard**

Aug. 20, 2005



Database Load Time: 04:20:00

Load Included Backup: Y

Total Data Storage /
Database Size: 18.53

RAID (Base Tables Only): N

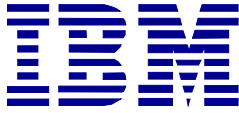
RAID (Base Tables and Auxiliary
Data Structures): N

RAID (All): N

Configuration
Processors/Cores/
Threads
Memory
Disk Controllers
Disk Drives
Total Disk Storage

4/4/8
16
6
160
4

Intel Xeon MP at 3.66GHz with 1MB ECC L2 Cache
2GB PC2-3200 DDR2 ECC SDRAM RDIMM
ServeRAID-6M Ultra320 SCSI Adapter
36.4GB 15K Ultra320 SCSI Drive
36.4GB 15K Ultra320 SCSI Drive
5559.6GB



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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 eServer xSeries 366	8863-2RU	IBM		1	1	9,999	
w/1 x 3.66GHz/1MB L2 Cache Xeon Processor MP							
w/2 x 1GB ECC SDRAM RDIMMs							
Integrated Dual-Channel Gigabit Ethernet							
xSeries 3.66GHz/1MB L2 Cache Xeon Processor MP	13N0695	IBM		1,999	3	5,997	
4GB (2x2GB) PC2-3200 DDR2 ECC SDRAM RDIMM	73P2867	IBM		2,339	8	18,712	
Active Memory™ Memory Expansion Card	13M7409	IBM		499	3	1,497	
ServeRAID-6M Ultra320 SCSI Contoller	32P0033	IBM		999	6	5,994	
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 (x366)	96P2253	IBM		900	1		900
ServicePac for 3-Year 24x7x4 Support (Monitor)	30L9183	IBM		90	1		90
Subtotal						42,362	990
Server Storage							
IBM EXP400 Rack Storage Exp. Enclosure	17331RU	IBM		3,099	12	37,188	
36.4GB 15K Ultra320 SCSI Hot-Swap Drive	90P1318	IBM		349	164	57,236	
Netfinity 2M Ultra2 SCSI Cable	03K9310	IBM		75	12	900	
NetBAY4SX Rack	93074SX	IBM		1,489	1	1,489	
ServicePac for 3-Year 24x7x4 Support (EXP400)	41L2768	IBM		760	12		9,120
ServicePac for 3-Year 24x7x4 Support (Rack)	41L2762	IBM		300	1		300
Subtotal						96,813	9,420
Server Software							
DB2 UDB ESE 8.2 SW Lic.& Maintenance 12 Months		IBM		22,608	4	90,432	
SW Maintenance Renewal - 1 Year		IBM		1,077	8		8,616
DPF SW License & Maintenance 12 Months		IBM		6,791	4	27,164	
DPF SW Maintenance Renewal - 1 Year		IBM		323	8		2,584
Microsoft Windows Server 2003 Enterprise Edition		Microsoft		2,334	1	2,334	
Microsoft Support		Microsoft		245	1		245
Microsoft Visual C++ .NET Standard		Microsoft		90	1	90	
Subtotal						120,020	11,445
Discount						20,876	2,082
Total						\$238,319	\$19,773

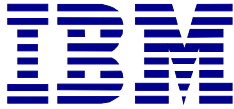
Three-Year Cost of Ownership USD: \$258,092

Pricing: 1 - IBM - To order, call 1-888-SHOP-IBM, and ask for xSeries Sales. Volume discounts of 15% on xSeries hardware and 20% on ServicePacs based on IBM Direct Guidance (Call 1-919-486-0818 for price verification.); 1 - IBM DB2: Bernard Spang, Director Database Market Management, spang@us.ibm.com, 914-766-1491; 2 - Microsoft; 3 - Amazon.com
Audited by Bradley J. Askins, InfoSizing, Inc.

QphH@300GB: 7,731.9

\$/QphH@300GB: \$33 USD

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	18.53
Start of Database Load	18:26:23
End of Database Load	22:45:51
Database Load Time	4:20
Query Streams for Throughput Test	6
TPC-H Power	10,137.7
TPC-H Throughput	5,897.0
TPC-H Composite Query-per-Hour (QphH@300GB)	7,731.9
Total System Price over 3 Years	\$258,092 USD
TPC-H Price/Performance Metric (\$/QphH@300GB)	\$33 USD

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 24,175

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	215224551	02/16/05 07:24:19 02/16/05 08:37:10	02/16/05 07:24:19 02/16/05 07:25:10	02/16/05 08:36:19 02/16/05 08:37:10	01:12:51
Stream 01	215224552	02/16/05 08:37:13 02/16/05 15:05:37	02/16/05 08:37:13 02/16/05 15:11:27	02/16/05 15:11:27 02/16/05 15:12:18	06:28:24
Stream 02	215224553	02/16/05 08:37:14 02/16/05 15:05:26	02/16/05 15:12:18 02/16/05 15:13:04	02/16/05 15:13:04 02/16/05 15:13:51	06:28:12
Stream 03	215224554	02/16/05 08:37:14 02/16/05 14:30:45	02/16/05 15:13:51 02/16/05 15:14:37	02/16/05 15:14:37 02/16/05 15:15:23	05:53:31
Stream 04	215224555	02/16/05 08:37:16 02/16/05 14:59:11	02/16/05 15:15:23 02/16/05 15:16:09	02/16/05 15:16:09 02/16/05 15:16:57	06:21:55
Stream 05	215224556	02/16/05 08:37:15 02/16/05 15:10:39	02/16/05 15:16:57 02/16/05 15:17:45	02/16/05 15:17:45 02/16/05 15:18:34	06:33:24
Stream 06	2152245517	02/16/05 08:37:15 02/16/05 15:09:26	02/16/05 15:18:34 02/16/05 15:19:19	02/16/05 15:19:19 02/16/05 15:20:08	06:32:11



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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	327.7	39.1	43.7	34.3	221.5	27.6	185.6	126.3	533.2	123.5	33.7	50.2
Stream 01	1,158.9	326.2	237.1	149.9	997.2	202.4	862.0	791.0	2,114.8	596.8	237.7	145.0
Stream 02	1,373.8	307.4	213.8	231.2	886.9	239.9	856.2	680.2	2,249.5	695.3	293.0	271.6
Stream 03	1,413.2	572.7	209.3	236.1	1,102.1	187.1	736.1	778.3	1,959.5	655.9	158.1	269.6
Stream 04	1,309.9	268.0	210.7	212.7	757.0	241.4	759.9	302.4	2,922.4	697.6	169.8	169.6
Stream 05	1,066.0	411.6	166.0	185.8	764.3	227.6	938.8	744.5	1,224.5	726.1	233.5	282.8
Stream 06	665.3	321.6	227.6	148.2	896.1	219.9	859.4	844.4	2,450.8	616.4	266.7	153.8
Minimum	665.3	268.0	166.0	148.2	757.0	187.1	736.1	302.4	1,224.5	596.8	158.1	145.0
Average	1,164.5	367.9	210.8	194.0	900.6	219.7	835.4	690.1	2,153.6	664.7	226.5	215.4
Maximum	1,413.2	572.7	237.1	236.1	1,102.1	241.4	938.8	844.4	2,922.4	726.1	293.0	282.8

Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	366.7	29.4	36.0	94.7	189.7	726.6	199.2	66.4	691.4	122.4	50.9	51.6
Stream 01	2,515.4	225.2	201.7	860.6	870.4	3,315.0	1,522.5	754.1	4,437.2	782.9	48.0	51.4
Stream 02	1,649.0	200.0	307.7	804.8	1,489.3	4,151.7	1,309.3	527.7	3,861.0	693.5	45.9	47.3
Stream 03	1,639.2	134.2	332.9	900.2	1,137.4	4,036.2	1,413.7	399.1	2,317.8	622.0	45.7	45.8
Stream 04	1,820.8	159.2	360.6	1,076.5	1,396.7	3,416.4	1,508.5	455.1	4,210.1	489.7	46.1	48.3
Stream 05	1,749.5	74.7	289.4	1,061.0	1,334.9	5,087.7	1,404.9	538.3	4,385.9	705.9	47.5	49.2
Stream 06	2,158.5	178.6	397.9	898.0	1,248.8	4,630.9	1,415.3	671.0	3,372.1	890.0	45.1	48.8
Minimum	1,639.2	74.7	201.7	804.8	870.4	3,315.0	1,309.3	399.1	2,317.8	489.7	45.1	45.8
Average	1,922.1	162.0	315.0	933.5	1,246.3	4,106.3	1,429.0	557.6	3,764.0	697.3	46.4	48.5
Maximum	2,515.4	225.2	397.9	1,076.5	1,489.3	5,087.7	1,522.5	754.1	4,437.2	890.0	48.0	51.4