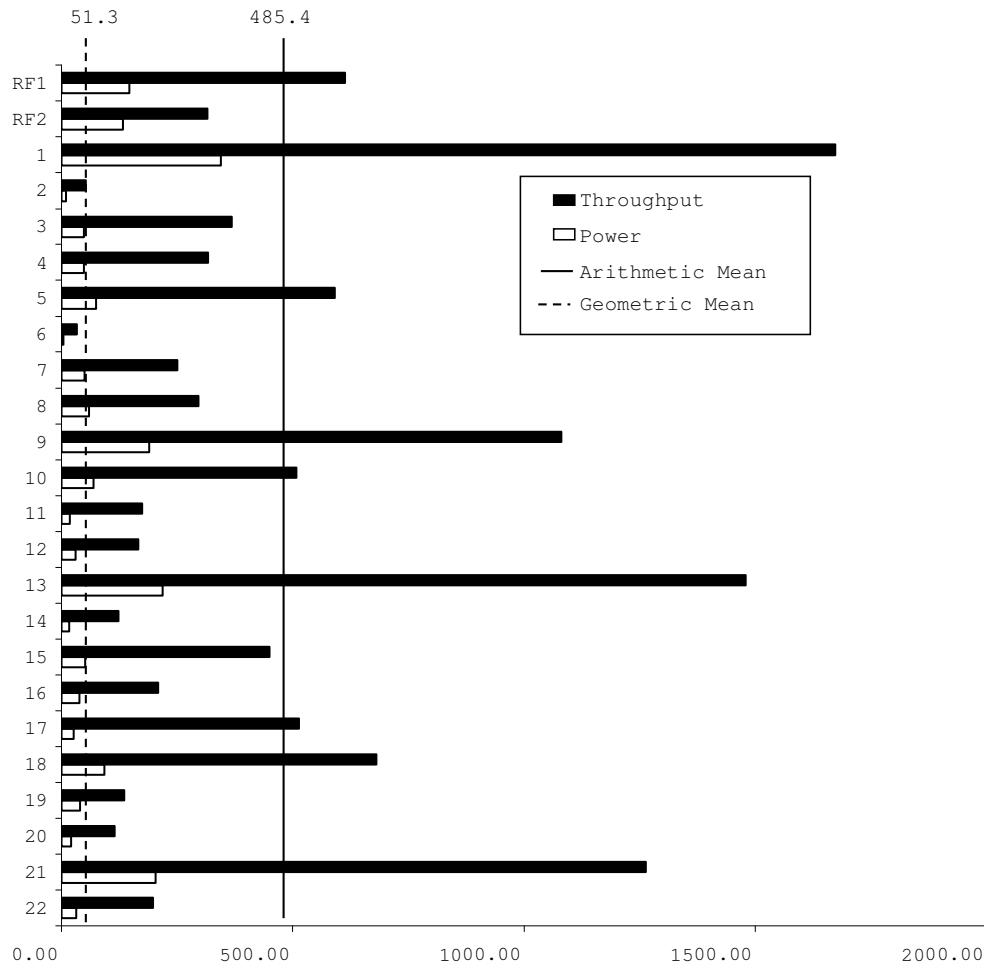


IBM Power 780 Model 9179-MHB

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TPC Pricing Rev 1.6.0

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October 14, 2011

Total System Cost	Composite Query per Hour Rating			Price/Performance
\$1,221,654 USD	192,001.1 QphH@3000GB			\$6.37 USD \$/QphH@3000GB
Database Size	Database Manager	Operating System	Other Software	Availability Date
3000GB	Sybase IQ Single Application Server Edition v.15.4	AIX 7.1	None	November 30, 2011

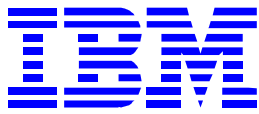


Storage Redundancy Levels		
Database Load Time: 05:51:50	Base Tables	3
Load Includes Backup: N	Auxiliary Structures	3
Total Disk/Database Size: 5.20	DBMS Temporary Space	3
Memory/Database Size Percentage: 34.1%	OS and DBMS Software	0

System Configuration

1 IBM Power 780 Model 9179-MHB

Processors/Cores/Threads/Type	8/32/128 IBM POWER7 4.1GHz, 256KB L2/32MB L3 cache
Memory	1024 GB
Disk Controllers	20 x IBM PCI-E RAID & SSD 3Gb SAS Adapter
Disk Drawers	5 x IBM EXP 12X I/O Drawer PCIe
Disk Drives	80 x 177GB SAS SSD; 5 x 146GB 15k RPM SFF SAS Disk
Total Disk Storage	15,610 GB (GB is defined as 1024 * 1024 * 1024 bytes)



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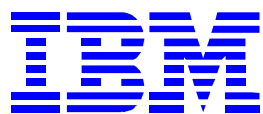
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Description	Part Number	Brand	Price Source	Unit Price	Qty	Extended Price	3-Yr. Maint. Price
Server Hardware							
9179 Model MHB	9179-MHB	IBM	1	\$10,195.00	1	\$10,195	\$3,072
Integrated, 4 Port- 1Gb Virtual Ethernet	1803	IBM	1	\$699.00	4	\$2,796	
GX++ 12X DDR Adapter, Dual-port	1808	IBM	1	\$1,499.00	5	\$7,495	
Operator Panel	1853	IBM	1	\$1,000.00	1	\$1,000	
3.0 Meter 12X DDR Cable	1865	IBM	1	\$623.00	10	\$6,230	
146GB 15K RPM SFF SAS Disk Drive	1886	IBM	1	\$652.00	5	\$3,260	
Serv Interface Cable- 2, 3, and 4 Enclosure	3671	IBM	1	\$2,000.00	1	\$2,000	
Serv Interface Cable- 3 and 4 Enclosure	3672	IBM	1	\$3,000.00	1	\$3,000	
Serv Interface Cable- 4 Enclosure	3673	IBM	1	\$4,000.00	1	\$4,000	
Processor Cable, Two, Three or Four Drawer System	3712	IBM	1	\$5,000.00	1	\$5,000	
Processor Cables, Three or Four Drawer System	3713	IBM	1	\$10,000.00	1	\$10,000	
Processor Cables, Four-Drawer System	3714	IBM	1	\$12,000.00	1	\$12,000	
Bundle: 5 x #2055 and 20 x #1995 (AIX/Linux)	4367	IBM	1	\$98,114.00	4	\$392,456	\$65,280
3.86GHz/4.14GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory	4982	IBM	1	\$57,429.00	4	\$229,716	\$24,288
One Processor Activation for Processor Feature #4982	5469	IBM	1	\$8,375.00	32	\$268,000	\$92,160
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	5597	IBM	1	\$12,000.00	4	\$48,000	
0/64GB DDR3 Memory (4X16GB) DIMMS - 1066MHz - POWER7 CoD Memory	5601	IBM	1	\$7,720.00	16	\$123,520	
System AC Power Supply, 1725 W, for Redundant Power	5632	IBM	1	\$1,502.00	8	\$12,016	
Disk/Media Backplane	5652	IBM	1	\$4,000.00	4	\$16,000	
Service Processor	5664	IBM	1	\$4,000.00	2	\$8,000	
FSP/Clock Pass Through Card	5665	IBM	1	\$900.00	2	\$1,800	
SATA Slimline DVD-RAM Drive	5762	IBM	1	\$392.00	1	\$392	
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	5767	IBM	1	\$692.00	1	\$692	
12X I/O Drawer PCIe, SFF disk	5802	IBM	1	\$15,705.00	5	\$78,525	\$39,000
Power Control Cable (SPCN) - 3 meter	6006	IBM	1	\$52.00	7	\$364	
Power Cable -- Drawer to IBM PDU, 14-foot,250V/10A	6577	IBM	1	\$19.00	18	\$342	
Activation of 1 GB DDR3 POWER7 Memory	8212	IBM	1	\$245.00	24	\$5,880	
Activation of 100 GB DDR3 POWER7 Memory	8213	IBM	1	\$24,500.00	10	\$245,000	
TurboCore Mode Specify Code	9982	IBM	1	\$0.00	1	\$0	
7014-T42 Rack	7014-T42	IBM	1	\$3,970.00	1	\$3,970	\$888
Front Door (Black) for High Perforation	6069	IBM	1	\$550.00	1	\$550	
Side Panel (Black)	6098	IBM	1	\$150.00	2	\$300	
PDU to Wall Powercord 14', 200-240V/24A, UTG0247, PT#12	6654	IBM	1	\$240.00	6	\$1,440	
Power Dist Unit - Side Mount, Universal UTG0247 Connector	7188	IBM	1	\$1,000.00	5	\$5,000	
7042-C08 HMC 1:7042-C08 Deskside Hardw.Mgmt.Console	7042-C08	IBM	1	\$2,800.00	1	\$2,800	\$768
Internal Modem	0033	IBM	1	\$200.00	1	\$200	\$576
Modem Cable - US/Canada and General Use	1025	IBM	1	\$17.00	1	\$17	
PCIe1Gb Ethernet UTP 2Port	5767	IBM	1	\$682.00	1	\$682	
Full Width Quiet Touch Keyboard -- USB, US English, #103P	5951	IBM	1	\$107.00	1	\$107	
Power Cord (6-foot), To Wall (125V, 15A), Plug Type #4	6470	IBM	1	\$18.00	1	\$18	
Ethernet Cable, 15m, Hardware Management Console to System Unit	7802	IBM	1	\$33.00	1	\$33	
USB Mouse	8845	IBM	1	\$39.00	1	\$39	
THC 14" Monitor (2 spares)	H94-1400	THC	3	\$89.99	3	\$270	
						\$1,513,105	\$226,032
Server Software							
HMC Software Support - 1 Year, plus 24x7 UPG		IBM	1	\$250.00	3		\$1,011
IBM AIX Standard Edition Version 7.1 Per Processor - Large POWER 7	5765-G98	IBM	1	\$2,600.00	32	\$83,200	
Software Maintenance for AIX Std Ed., Per Proc 1 Yr SWMA Large Pwr 7 Reg - 5771-SWM	1516	IBM	1	\$650.00	32		\$62,400
Software Maintenance for AIX Std Ed., Per Proc 1 Yr SWMA Large Pwr 7 7 x24 - 5771-SWM	1517	IBM	1		32		\$16,416
Sybase IQ Single Application Server Edition		Sybase	2	\$2,595.00	32	\$83,040	
Sybase IQ Maintenance Renewal -3 Year		Sybase	2	\$1,713.00	32		\$54,816
				Subtotal		\$166,240	\$134,643
				Total		\$2,040,020	
IBM Dollar Volume Discount (See Note 1.)			1			\$797,688	
Sybase IQ Discount (See Note 2.)			2			\$20,678	

Pricing: 1 - IBM; 2 - Sybase, 3 - TD
 Note 1: Discount based on IBM guidance applies to all hardware, software and maintenance line items where Price Source=1.
 Note 2: Discount based on Sybase guidance applies to all line items where Price Source=2.
 Pricing is for one system or one of similar size.
 Audited by Francois Raab of InfoSizing, Inc. (www.sizing.com)

Three-Year Cost of Ownership USD: \$1,221,654
QppH 192,001
\$ USD/QppH \$6.37

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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Numerical Quantities Summary

Measurement Results

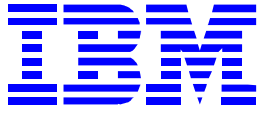
Database Scale Factor	=	3000
Total Data Storage/Database Size	=	5.20
Start of Database Load	=	9/29/2011 05:38:21
End of Database Load	=	9/29/2011 11:30:11
Database Load Time	=	05:51:50
Query Streams for Throughput Test	=	8
TPC-H Power	=	210,368.4
TPC-H Throughput	=	175,237.4
TPC-H Composite Query-per-Hour Metric (QphH@3000GB)	=	192,001.1
Total System Price Over 3 years	=	\$1,221,654 USD
TPC-H Price Performance Metric (\$/QphH@3000GB)	=	\$6.37 USD

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	=	10,847
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Duration of Stream Execution

Stream ID	Seed Used	Date and Time Stamps						Duration
		Query Start		RF1 Start		RF2 Start		Queries
		Query End		RF1 End		RF2 End		RFs
Stream 00	929113011	9/29/2011 15:53:26	9/29/2011 15:50:56	9/29/2011 16:21:45			0:28:11	
		9/29/2011 16:21:37	9/29/2011 15:53:24	9/29/2011 16:23:58			0:04:46	
Stream 01	929113012	9/29/2011 16:23:58	9/29/2011 16:24:58	9/29/2011 16:30:59			2:57:17	
		9/29/2011 19:21:15	9/29/2011 16:30:58	9/29/2011 16:35:52			0:10:54	
Stream 02	929113013	9/29/2011 16:23:59	9/29/2011 16:35:52	9/29/2011 16:47:23			3:00:46	
		9/29/2011 19:24:45	9/29/2011 16:47:22	9/29/2011 16:51:49			0:15:57	
Stream 03	929113014	9/29/2011 16:23:59	9/29/2011 16:51:49	9/29/2011 17:16:06			2:58:39	
		9/29/2011 19:22:38	9/29/2011 17:16:06	9/29/2011 17:20:38			0:28:49	
Stream 04	929113015	9/29/2011 16:23:59	9/29/2011 17:20:38	9/29/2011 17:37:13			2:59:43	
		9/29/2011 19:23:42	9/29/2011 17:37:13	9/29/2011 17:42:31			0:21:53	
Stream 05	929113016	9/29/2011 16:23:59	9/29/2011 17:42:31	9/29/2011 17:47:20			2:54:59	
		9/29/2011 19:18:58	9/29/2011 17:47:20	9/29/2011 17:52:15			0:09:44	
Stream 06	929113017	9/29/2011 16:23:59	9/29/2011 17:52:15	9/29/2011 17:57:15			2:58:19	
		9/29/2011 19:22:18	9/29/2011 17:57:15	9/29/2011 18:04:28			0:12:13	
Stream 07	929113018	9/29/2011 16:23:58	9/29/2011 18:04:28	9/29/2011 18:09:25			2:57:02	
		9/29/2011 19:21:00	9/29/2011 18:09:25	9/29/2011 18:14:02			0:09:34	
Stream 08	929113019	9/29/2011 16:23:59	9/29/2011 18:14:00	9/29/2011 18:22:39			2:57:02	
		9/29/2011 19:21:01	9/29/2011 18:22:39	9/29/2011 18:28:54			0:14:54	



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TPC-H Timing Intervals (in seconds)

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 0	344.6	9.6	48.2	49.3	75.4	4.4	49.5	59.8	189.2	69.1	18.3	30.8
Stream 01	1468.2	74.4	360.5	191.1	473.4	32.5	159.7	314.5	1039.3	499.0	118.3	177.7
Stream 02	1613.6	46.4	384.0	207.3	669.9	36.1	338.2	353.1	1042.1	399.0	232.2	224.4
Stream 03	1303.0	44.9	182.3	321.9	551.9	25.3	317.6	292.9	1351.4	592.1	264.1	115.7
Stream 04	1826.5	54.3	147.8	322.6	709.5	37.9	292.1	308.8	992.8	614.9	193.9	169.7
Stream 05	1995.2	63.6	518.3	363.9	783.5	43.1	243.4	333.0	869.0	448.2	152.1	146.4
Stream 06	1953.1	44.3	357.8	261.9	502.4	23.6	262.2	189.2	1061.6	577.9	261.9	199.0
Stream 07	1641.1	46.0	567.6	295.7	545.4	16.6	183.2	286.4	1086.0	484.2	104.4	106.9
Stream 08	1585.5	48.7	428.8	575.5	490.4	56.6	205.9	288.3	1199.8	443.2	65.9	188.5
Minimum	1303.0	44.3	147.8	191.1	473.4	16.6	159.7	189.2	869.0	399.0	65.9	106.9
Average	1673.3	52.8	368.4	317.5	590.8	34.0	250.3	295.8	1080.3	507.3	174.1	166.0
Maximum	1995.2	74.4	567.6	575.5	783.5	56.6	338.2	353.1	1351.4	614.9	264.1	224.4
Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	218.7	17.1	51.9	38.4	27.1	92.4	39.8	20.4	203.8	32.6	147.3	133.2
Stream 01	1685.6	156.4	481.5	196.8	610.5	637.1	158.3	138.6	1423.4	239.6	359.9	293.0
Stream 02	1815.3	179.7	437.6	257.4	637.2	694.4	118.3	126.2	782.2	251.6	690.6	266.1
Stream 03	1167.8	107.3	593.8	167.3	577.5	724.4	158.2	124.9	1518.1	216.5	1456.8	272.2
Stream 04	1604.9	82.1	479.2	200.0	399.9	630.3	97.6	40.5	1373.5	204.3	994.7	317.2
Stream 05	1446.3	116.4	291.2	165.6	457.3	492.9	85.1	95.1	1259.0	130.4	289.5	294.6
Stream 06	1244.5	135.5	472.6	258.3	447.9	1048.5	84.9	129.9	959.9	222.6	299.8	433.1
Stream 07	1453.4	107.3	388.6	231.6	515.4	718.4	209.5	115.4	1359.4	158.9	296.6	277.0
Stream 08	1413.4	96.1	453.1	194.9	465.2	495.7	173.3	154.6	1435.6	163.1	516.4	375.4
Minimum	1167.8	82.1	291.2	165.6	399.9	492.9	84.9	40.5	782.2	130.4	289.5	266.1
Average	1478.9	122.6	449.7	209.0	513.9	680.2	135.7	115.7	1263.9	198.4	613.0	316.1
Maximum	1815.3	179.7	593.8	258.3	637.2	1048.5	209.5	154.6	1518.1	251.6	1456.8	433.1