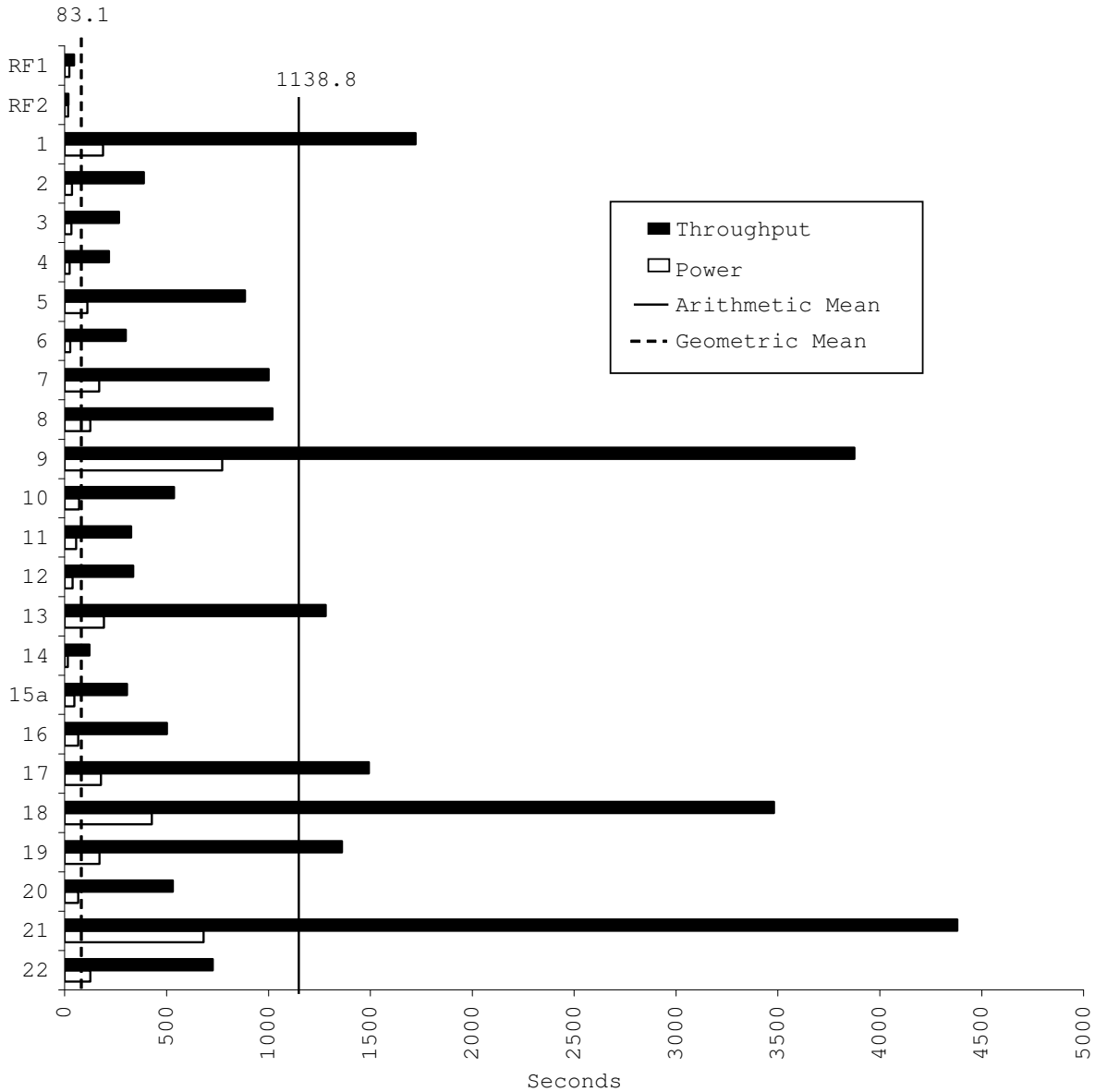


# IBM System p 570 with DB2 Warehouse 9.5

TPC-H Rev. 2.6.0

**Report Date:  
October 15, 2007**

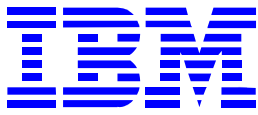
Total System Cost	Composite Query per Hour Rating			Price/Performance
11,300,155 USD	343,551.2 QphH@10000GB			32.89 USD Price/QphH@10000GB
Database Size	Database Manager	Operating System	Other Software	Availability Date
10000GB	DB2 Warehouse 9.5	AIX 5L V5.3	None	April 15, 2008



Database Load Time: 1:40:29	Load included backup: N	Total Data Storage/Database Size: 11.05
RAID (base tables): Y	RAID (Base Tables and Auxiliary Data Structures): Y	RAID (All): N

**System Configurations**  
**32 IBM System p 570 servers, each server with**

- Processors** 2 x 4.7GHz POWER6 with 2 x 32MB L3 Cache
- Memory** 32GB
- Disk Controllers** 4 x 4Gigabit Fibre Channel PCI-E Adapters & 1IBM TotalStorage DS4800 dual controllers
- Disk Drives** 96 x 36.4GB 15K 4Gb FC drives, with 96 x 73.4GB on server14 ; 2 x 73.4GB SAS drives, with 3 additional on server1
- Network** 1 Integrated 10Gigabit Ethernet
- Total Disk Storage** 110,489.27 GB (GB is defined as 1024 \* 1024 \* 1024 bytes)

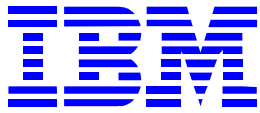


# IBM System p 570 with DB2 Warehouse 9.5

TPC-H Rev. 2.6.0

**Report Date:**  
October 15, 2007

Description	Part No.	Source	Unit Price	Qty	Ext Price	Maint Price
<b>Server Hardware</b>						
Server 1:9117 Model MMA	9117-MMA	1	10,195	32	326,240	228,672
Op Panel (MMA)	1845	1	199	32	6,368	
73.4GB SAS DASD, 15K RPM	3646	1	659	67	44,153	
One Processor Activation for Processor Feature #7380	5403	1	23,000	128	2,944,000	506,880
P6 Processor Power Regulator	5625	1	1,500	96	144,000	
System CEC Enclosure with Bezel	5626	1	500	32	16,000	
AC Power Supply, 200-240v, 1500 Watt	5628	1	1,502	64	96,128	
Media Enclosure and Backplane	5629	1	185	32	5,920	
Integrated, 2X- 10Gb (SR) Virtual Ethernet	5637	1	5,600	32	179,200	
Service Processor Interface	5648	1	1,000	32	32,000	
Processor Enclosure and Backplane	5663	1	2,000	32	64,000	
I/O Backplane	5666	1	4,500	32	144,000	
System Midplane	5667	1	1,000	32	32,000	
SAS DASD Backplane, 6-pk	5668	1	1,051	32	33,632	
Activation of 1GB DDR2- P6 Memory	5680	1	1,515	1024	1,551,360	
0/8GB DDR2 Memory (4X2GB) DIMMS- 667	5694	1	3,035	128	388,480	
System Ship Group	5699	1	20	32	640	
IDE Slimline DVD-ROM Drive	5756	1	275	32	8,800	
4 Gigabit PCI Express Single Port Fibre	5773	1	1,999	128	255,872	
Line Cord, DRWR TO IBM PDU, 14', 200-240V/10A,	6458	1	19	64	1,216	
Rack Mount kit for IBM 19" rack	7164	1	222	32	7,104	
4.7GHz POWER6 -2 Core Processor Card, 0-core active	7380	1	11,500	64	736,000	274,944
Power Distribution Backplane	7870	1	265	32	8,480	
Rack Model T00	7014-T00	1	2,920	4	11,680	3,072
Front Trim Kit For 1.8 Meter Rack (Black)	6246	1	158	4	632	
Side Panel (Black)	6098	1	150	8	1,200	
PDU to 14', 200-240V/24A, UTG0247, PT#12	6654	1	240	4	960	
HMC 1:7310-C05 Desktop Hardw.Mgmt.Console	7042-C06	1	1,830	1	1,830	1,344
IBM ThinkVision C170 17-inch Color Monitor	3631	1	250	1	250	
Power Cord (6-foot), To Wall Plug Type #4	6470	1	18	2	36	
Ethernet Cable, 6M, HMC to System Unit	7801	1	15	1	15	
Keyboard - English, #103P	8800	1	104	1	104	
Mouse - Attachment Cable	8841	1	78	1	78	
<b>Subtotal</b>					<b>7,042,378</b>	<b>1,014,912</b>
<b>Storage</b>						
DS4800 Disk System Model 82	1815-82A	1	53,995	32	1,727,840	
DS4800 8-Storage Partitions	8870	1	10,000	32	320,000	
(22R4255) DS4800 AIX Host Kit	7711	1	7,000	32	224,000	
DS4000 EXP810 Enclosure	1812-81A	1	6,000	256	1,536,000	
36GB/15K Drive 4Gb FC disks	5412	1	892	2,976	2,654,592	
73.4GB/15K Drive 4Gb FC disks	5413	1	1,445	96	138,720	
IBM S2 42U Standard Rack	93074RX	1	1,489	24	35,736	7,200
Short Wave SFP	2410	1	998	192	191,616	
Fiber Cable 25m	5625	1	189	128	24,192	
Fiber Cable 1m	5601	1	79	512	40,448	
3 Year Warranty Service Upgrade 1812-81A 24x7x4	10N3651	1	960	256		245,760
3 Year Warranty Service Upgrade 1815-82A 24x7x4	41C5953	1	3,200	32		102,400
<b>Subtotal</b>					<b>6,893,144</b>	<b>355,360</b>



# IBM System p 570 with DB2 Warehouse 9.5

TPC-H Rev. 2.6.0

Report Date:  
October 15, 2007

**Server Software**

AIX 5.3 (media only)	5692-A5L	1	50	1	50	
AIX Software per Processor	5765-G03	1	1,225	128	156,800	
Software Maintenance for AIX, 3 Year	5773-SM3	1				
F5 3 Yr SWMA for AIX per Processor	466	1	1,958	128		250,624
F5 3 yr Services 7x24 Support per Processor	468	1	496	128		63,488
Initial Software Support 3 Year	5773-RS3					
Per Processor Software Support 3 Year	569	1	675	1		675
Per Processor 24x7 Software Support 3 Year	570	1	236	1		236
C for AIX user Lic+SW maint 12 MO	D5A1DLL	1	975	1	975	
C for AIX user annual SW maint renewal	E1A1FLL	1	195	2		390
DB2 Data Warehouse Base Edition Value Unite Lic +1 year Maintenance		1	345	15,360	5,297,818	
DB2 Data Warehouse Base Edition SW Maintenance Renewal - 1 year		1	17	30,720		506,880
				<b>Subtotal</b>	<b>5,455,643</b>	<b>822,293</b>
<b>Third Party Hardware/Software</b>						
Catayst 6500 10 Gigabit Switch		2	182,476	1	182,476	23,286
5m Multimode LC/SC Duplex Fiber Optic cable		3	30	32	960	
				<b>Subtotal</b>	<b>183,436</b>	<b>23,286</b>
				<b>Total</b>	<b>19,572,624</b>	<b>2,215,851</b>
				<b>Total IBM Discounts*</b>		<b>-10,489,308</b>

<b>Three-Year Cost of Ownership</b>	<b>11,299,167</b>
<b>QphH</b>	<b>343,551</b>
<b>\$/QphH</b>	<b>32.89</b>

**Notes:**

For pricing details and contact information please see appendix E

Pricing Sources: 1) IBM 2) AlwaysLowest 3) CDW

All hardware is currently available. The availability of DB2 V9.5 is April 15, 2008.

\*Discounts are based on US list prices for similar quantities & configurations including pre-payment for maintenance. The discount of 48.6% applies to the totality of all items with price source of "1".

Audited by: Francois Raab of Infosizing (www.sizing.com)

The system as configured for the test will be available April 15, 2008.

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 base 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 the stated prices are not available according to these terms, please notify the TPC at [pricing@tpc.org](mailto:pricing@tpc.org). Thank You.



# IBM System p 570 with DB2 Warehouse 9.5

TPC-H Rev. 2.6.0

Report Date:  
October 15, 2007

## Numerical Quantities Summary

### Measurement Results

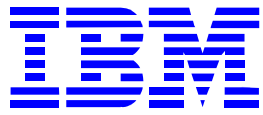
Database Scaling (SF/Size)	=	10000
Total Data Storage/Database Size	=	11.05
Start of Database Load	=	9/29/07 16:22:05
End of Database Load	=	9/29/07 18:02:34
Database Load Time	=	1:40:29
Query Streams for Throughput Test	=	9
TPC-H Power Metric (QppH@10000GB)	=	433,280.4
TPC-H Throughput Metric (QthH@10000GB)	=	272,404.2
Composite Query-per-Hour Rating (QphH@10000GB)	=	343,551.2
Total System Price over 3 years	=	11,300,155 USD
TPC-H Price/Performance Metric (\$/QphH@10000GB)	=	32.89 USD

### Measurement Intervals

Measurement Interval in Throughput Test (Ts) = 26,167 seconds

### 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	929180234	9/29/2007	18:55:15	9/29/2007	18:54:52	9/29/2007	19:55:38	1:00:23
		9/29/2007	19:55:38	9/29/2007	18:55:15	9/29/2007	19:55:56	0:00:41
Stream 01	929180235	9/29/2007	19:56:53	9/30/2007	3:03:16	9/30/2007	3:03:39	6:33:19
		9/30/2007	02:30:12	9/30/2007	3:03:39	9/30/2007	3:04:00	0:00:44
Stream 02	929180236	9/29/2007	19:56:53	9/30/2007	3:04:00	9/30/2007	3:05:02	7:01:39
		9/30/2007	2:58:31	9/30/2007	3:05:02	9/30/2007	3:05:21	0:01:21
Stream 03	929180237	9/29/2007	19:56:53	9/30/2007	3:05:21	9/30/2007	3:06:19	7:03:51
		9/30/2007	3:00:44	9/30/2007	3:06:19	9/30/2007	3:06:42	0:01:21
Stream 04	929180238	9/29/2007	19:56:53	9/30/2007	3:06:42	9/30/2007	3:07:33	6:47:35
		9/30/2007	2:44:27	9/30/2007	3:07:33	9/30/2007	3:07:50	0:01:08
Stream 05	929180239	9/29/2007	19:56:53	9/30/2007	3:07:50	9/30/2007	3:08:37	7:02:43
		9/30/2007	2:59:35	9/30/2007	3:08:37	9/30/2007	3:08:55	0:01:05
Stream 06	929180240	9/29/2007	19:56:53	9/30/2007	3:08:55	9/30/2007	3:09:39	7:06:23
		9/30/2007	3:03:16	9/30/2007	3:09:39	9/30/2007	3:09:57	0:01:02
Stream 07	929180241	9/29/2007	19:56:53	9/30/2007	3:09:57	9/30/2007	3:10:39	6:57:35
		9/30/2007	2:54:27	9/30/2007	3:10:39	9/30/2007	3:11:00	0:01:03
Stream 08	929180242	9/29/2007	19:56:53	9/30/2007	3:11:00	9/30/2007	3:11:38	7:03:55
		9/30/2007	3:00:47	9/30/2007	3:11:38	9/30/2007	3:11:57	0:00:57
Stream 09	929180243	9/29/2007	19:56:53	9/30/2007	3:11:57	9/30/2007	3:12:42	7:01:06
		9/30/2007	2:57:59	9/30/2007	3:12:42	9/30/2007	3:13:00	0:01:03



# IBM System p 570 with DB2 Warehouse 9.5

TPC-H Rev. 2.6.0

Report Date:  
October 15, 2007

## Timing Interval (in seconds)

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 0	188.1	36.1	32.2	24.0	111.6	26.5	169.0	126.1	773.4	70.4	55.9	38.4
Stream 01	1685.6	224.7	173.8	254.3	963.6	143.3	767.1	927.8	3690.2	538.3	344.0	387.5
Stream 02	1684.5	225.8	296.0	377.9	872.5	211.6	961.3	779.2	4360.8	532.2	563.9	338.3
Stream 03	1905.3	1567.2	45.3	175.0	1075.7	162.5	1024.7	1081.5	3372.2	549.1	455.7	116.3
Stream 04	1928.1	294.9	179.1	143.5	927.1	111.2	1049.6	984.3	3823.5	605.7	273.9	358.8
Stream 05	1647.7	160.1	609.9	226.9	797.6	248.7	1229.0	1023.9	2986.1	418.6	414.8	464.9
Stream 06	1558.3	382.1	303.9	124.9	897.4	340.3	909.4	1130.3	4527.9	611.3	242.7	354.5
Stream 07	1790.8	173.4	282.0	201.8	862.0	126.9	1161.6	1198.8	3970.1	465.6	286.2	171.0
Stream 08	1761.3	94.5	213.1	246.5	1012.9	968.8	901.5	971.7	3746.0	575.7	135.2	335.9
Stream 09	1530.5	375.4	287.9	195.9	554.3	381.4	1009.5	1083.0	4393.1	528.3	225.9	496.2
Minimum	1530.5	94.5	45.3	124.9	554.3	111.2	767.1	779.2	2986.1	418.6	135.2	116.3
Average	1721.3	388.7	265.7	216.3	884.8	299.4	1001.5	1020.1	3874.4	536.1	326.9	335.9
Maximum	1928.1	1567.2	609.9	377.9	1075.7	968.8	1229.0	1198.8	4527.9	611.3	563.9	496.2
Stream ID	Q13	Q14	Q15a	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	192.1	16.6	46.9	66.4	177.8	427.5	171.2	66.3	680.8	125.3	23.3	17.8
Stream 01	1571.4	106.2	488.1	627.3	1098.8	3645.9	743.3	326.9	4023.7	867.5	23.0	21.4
Stream 02	1263.0	145.2	406.1	635.5	1411.8	3283.2	1631.5	719.7	3924.5	673.9	61.5	19.0
Stream 03	883.3	145.9	217.2	229.0	1713.2	3196.0	1318.5	408.1	5112.3	677.2	58.8	22.3
Stream 04	1127.6	135.0	218.1	498.8	1432.8	3152.5	1531.6	371.4	4691.3	615.8	51.0	16.8
Stream 05	1302.2	134.2	331.7	467.6	1815.2	3766.7	1573.3	768.8	4146.0	828.8	47.8	17.3
Stream 06	1357.2	133.1	333.9	610.5	1666.5	4784.3	1686.9	464.9	2435.2	727.7	44.2	18.2
Stream 07	1097.1	86.2	167.3	539.7	1240.1	2950.2	1711.0	453.9	5314.2	804.9	41.3	21.6
Stream 08	1494.3	112.6	251.8	665.9	1576.2	2913.6	1339.4	462.9	5020.2	634.8	38.0	19.2
Stream 09	1433.4	92.5	328.1	239.2	1490.1	3634.4	706.1	805.3	4758.3	717.3	44.8	17.9
Minimum	883.3	86.2	167.3	229.0	1098.8	2913.6	706.1	326.9	2435.2	615.8	23.0	16.8
Average	1281.1	121.2	304.7	501.5	1493.9	3480.8	1360.2	531.3	4380.6	727.5	45.6	19.3
Maximum	1571.4	145.9	488.1	665.9	1815.2	4784.3	1711.0	805.3	5314.2	867.5	61.5	22.3