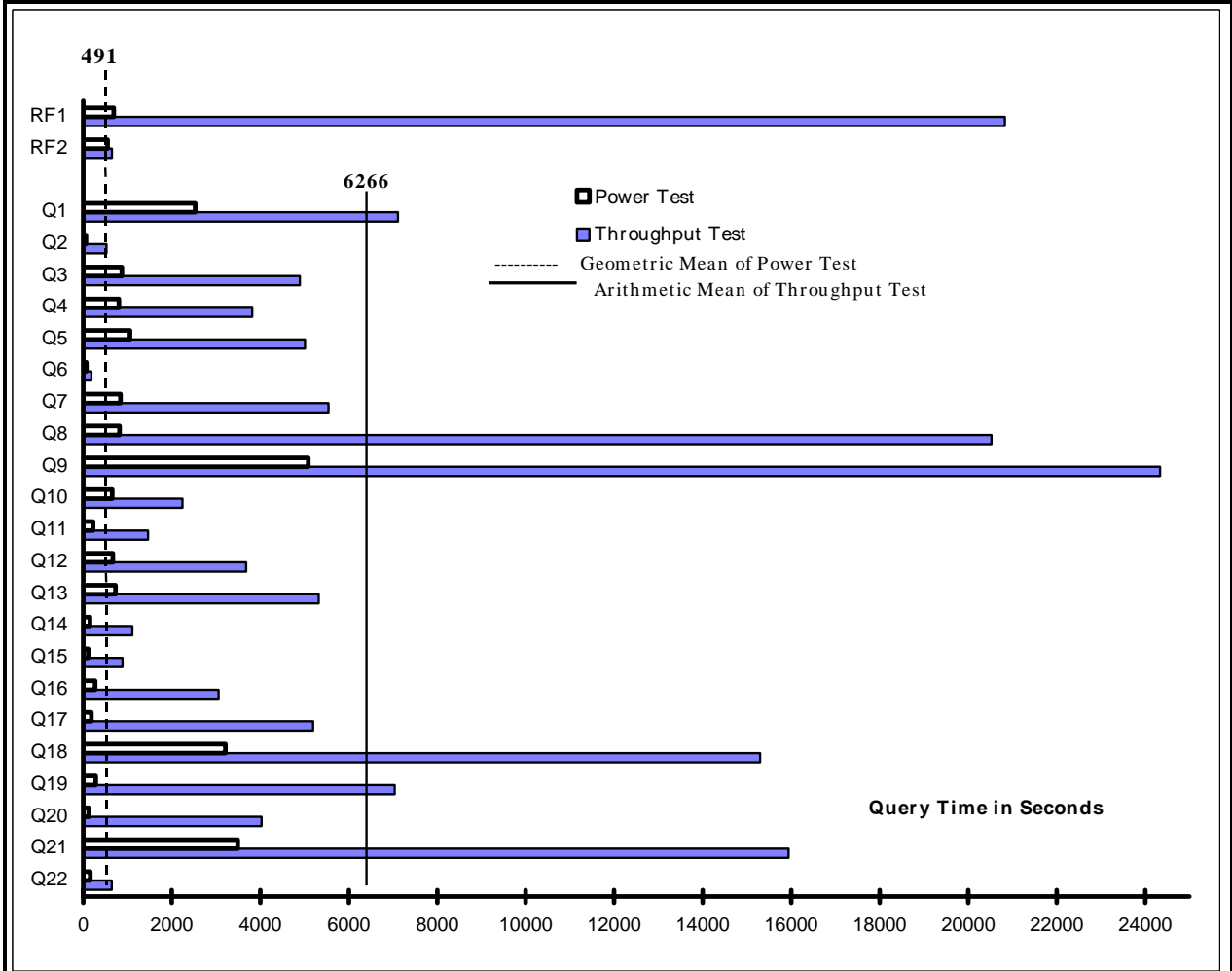


UNISYS	ES7000 Aries 420 Enterprise Server		TPC-H Rev. 2.1.0		
			Report Date 15-Oct-03		
Total System Cost		Composite Query per Hour Rating		Price Performance	
\$619,308		5,199.1 / QphH @ 1000GB		\$119.12 / QphH @ 1000GB	
Database size	Database Manager	Operating System	Other Software	Availability Date	
1000 GB*	Microsoft SQL Server 2000 Enterprise Edition 64-bit	Microsoft Windows Server 2003, Datacenter Edition	Microsoft Visual C++ MS Visual Studio Pro. Win 2000 Svr. Rsrc. Kit	October 15, 2003	



Database Load Time = 28:25:54		Load included backup: Y		Total Data Storage / Database Size = 7.72	
RAID (Base tables): N		RAID (Base tables and Auxiliary Data Structures): N		RAID (All): N	
System Configuration					
Processors	16 x 1.5 GHz Intel® Itanium2™ with 6MB Level 3 Cache				
Memory	64 GB Main Memory				
Disk Controllers	25 PCI Fibre Channel 2 PCI SCSI				
Disk Drives	135 18GB FC (16.97 GB useable) 75 73GB FC (68.24 GB useable) 4 72GB SCSI (68.36 GB useable) 1 36GB SCSI (34.8 GB useable)				
Total Disk Storage	7717.2 GB				
* Database size includes only raw data (eg, no temp, index, redundant storage space, etc.)					



ES7000 Aries 420 Enterprise Server

TPC-H Rev. 2.1.0

Report Date
10/15/2003

Description	Part No.	Third Party		Unit Price	Qty.	Extended Price	3 yr.Maint. Price
		Brand	Price				
Server Hardware:							
SVR:ES7/420 1.5GHz 1GB 4	ES7420166-100			1		\$260,300	\$12,936
RCK3619342-CEC	Included						
CAS7004166-GS SRV: 16X 1.5 32GB +MIP74200	Included						
1x RAID Controller, 2x 36GB Disk (boot media)	Included						
Sentinel System Management S/W and Media	Included						
MEM: 4GB, 1 GB DIMMs	MEM41-4GB			1	8	\$3,800	\$30,400
I/F:4-Slot I/O Mod, 100M	MOD3000-PCI			1	4	\$1,805	\$7,220
LAN HW:GIGABIT ETH OPT	ETH23311-P64			1	1	\$570	\$570
I/F: Monitor, 17-inch Color, Kybrd, Mse & Cable	ES70003-UIF			1	1	\$570	\$570
Server Subtotal						\$299,060	\$12,936
Storage Hardware:							
PCI-64 Ultra160 LVD SCSI RAID Adapter	RAD74232-P64			1	1	\$1,283	\$1,283
CABLE:OSM LVD 2M	CBL134-2			1	2	\$115	\$230
CABINET: ES7K SCSI BOOT	EXD 2142-IPL			1	1	\$1,615	\$1,615
DISK:72GB 15K RPM U320	HDM 72115-CX1			1	4	\$1,710	\$6,840
DISK:72GB 15K RPM U320 10% spares	HDM 72115-CX1			1	2	\$1,710	\$3,420
CTRL: FIBRE CHAN 2 66 LP9802 2gb HBA	FCH742313-P64			1	25	\$1,615	\$40,375
84 x DISK-1815-S2S5-B, 18GB Drives, 15Krpm, 2GB FC*	JBD201815-B84			1	1	\$29,839	\$29,839
70 x DISK-1815-S2S5-B, 18GB Drives, 15Krpm, 2GB FC*	JBD201815-B70			1	1	\$25,675	\$25,675
84 x DISK-7315-S2S5-B, 73GB Drives, 15Krpm, 2GB FC*	JBD207315-B84			1	1	\$89,902	\$89,902
RCK: FC 2Gb Storage, Optical/Optical I/F	JBD2020-SA			1	15	\$3,958	\$59,370
CBL: FC, 10 meter, LC to LC	CBL171-10			1	25	\$360	\$9,000
PWR: Distribution Strip, 9-Plug, 220V	SFR9-PWR			1	4	\$380	\$1,520
CBL: Power, U.S. (Domestic), C20 - L6-20P	USE1936-LC6			1	4	\$162	\$648
CAB: 36U x 19" x 41" Open Front Cabinet	HRT361941-OFT			1	2	\$1,425	\$2,850
DOOR: 36U x 19", Rear	HRT3619-RDR			1	2	\$475	\$950
PNL: 36U x 41" Side Skins, L&R HRT	HRT3641-SDS			1	2	\$760	\$1,520
INSTL: Stabilizer Foot	RM1936-FOT			1	2	\$162	\$324
Storage Subtotal						\$271,941	\$12,780
Server Software:							
O/S: Windows 2003 Srvr, Datacenter Edtn, 16P, 1yr Lsub.	WND2316-TSP			2	1	\$35,112	\$35,112
O/S: Windows 2003 Server, DC LmtD Sbscrptn, 1yr.	DUS200316-TSP			2	1	\$3,192	\$6,384
O/S: Windows 2003 Server DC Support, 24x7x4, 1yr.	GTS7523416-SSA			2	1	\$12,574	\$37,722
Microsoft SQL Server 2000 Enterprise Edition (64-bit)	810-00561 MS			2	2	\$5,549	\$5,549
SRVC: Microsoft Database Server Support Package	PRO-PRORS-16U-01			2	2	\$1,950	\$5,850
Microsoft SQL Server 2000 Client Licenses	359-00532 MS			2	2	\$146	\$10,220
Microsoft Visual Studio Professional 6.0 Win64	659-00844			2	2	\$1,079	\$1,079
ACC: Microsoft Windows 2000 Server Resource Kit	N/A			2	2	\$300	\$300
Software Subtotal						\$58,644	\$43,572
Configuration Total						\$629,645	\$69,288
Computer Resolutions Large Volume Cash Discount							(\$79,625)

Notes:

1. 3rd Party Brand & Pricing: 1 = CRI Product Price, Unisys Maint. Price; 2 = Microsoft
2. HW & SW maintenance figured at 24 x 7 w/ 4 hr. max. response time for spares.
3. * = 10% spare disks added in place of onsite service, rounded up for bundled pricing.
Used 135 18GB disks + 75 73GB disks; Spares are 19 18GB disks + 9 73GB disks.

Three Year Cost of Ownership: \$619,308
QpH @ 1TB: 5,199.1
\$/ QpH@1TB: \$119.12

Benchmark results and test methodology audited by Lorna Livingtree of Performance Metrics, 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 assumption 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 benchmarks specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank You.

Numerical Quantities Summary

Measurement Results

Scale Factor	1000 GB
Total Data Storage / Database Size	7.72
Start of Database Load	9/5/2003 22:39:45
End of Database Load	9/7/2003 3:05:39
Database Load Time	28:25:54
Query Streams for Throughput Test	7
TPC-H Power	7330.6
TPC-H Throughput	3687.4
Composite Query per Hour Rating (QpH@1000GB)	5199.1
Total System Price Over 3 Years	\$619,308
TPC-H Price Performance Metric	\$119.12

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	150351.3 seconds
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Duration of Stream Execution:

		Query Start Date/Time	RF1 Start Date/Time	RF2 Start Date/Time	
	Seed	Query End Date/Time	RF1 End Date/Time	RF2 End Date/Time	Duration
Stream 0	907030630	9/10/03 11:30:02 9/10/03 17:43:24	9/10/03 11:18:31 9/10/03 11:30:01	9/10/03 17:43:25 9/10/03 17:52:36	6:34:05
Stream 1	907030631	9/10/03 17:52:38 9/12/03 8:38:48	9/10/03 17:52:38 9/12/03 9:22:39	9/12/03 9:22:40 9/12/03 9:33:39	39:41:01
Stream 2	907030632	9/10/03 17:52:38 9/12/03 8:19:16	9/12/03 9:33:40 9/12/03 9:43:54	9/12/03 9:43:55 9/12/03 9:54:48	40:02:10
Stream 3	907030633	9/10/03 17:52:39 9/12/03 5:54:21	9/12/03 9:54:50 9/12/03 10:04:31	9/12/03 10:04:32 9/12/03 10:15:26	40:22:47
Stream 4	907030634	9/10/03 17:52:39 9/12/03 8:47:14	9/12/03 10:15:28 9/12/03 10:25:14	9/12/03 10:25:15 9/12/03 10:35:52	40:43:12
Stream 5	907030635	9/10/03 17:52:49 9/12/03 8:34:29	9/12/03 10:35:54 9/12/03 10:46:30	9/12/03 10:46:32 9/12/03 10:57:27	41:04:38
Stream 6	907030636	9/10/03 17:52:50 9/12/03 9:14:52	9/12/03 10:57:29 9/12/03 11:07:14	9/12/03 11:07:16 9/12/03 11:18:00	41:25:10
Stream 7	907030637	9/10/03 17:52:58 9/12/03 7:43:14	9/12/03 11:18:03 9/12/03 11:27:45	9/12/03 11:27:47 9/12/03 11:38:29	41:45:31

TPC-H Timing Intervals (in seconds):

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream 0	2530.8	60.2	873.2	807.4	1058.7	70.8	838.2	822.8
Stream 1	5039.7	331.9	7985.1	2738.2	6560.6	172.1	9809.8	19206.6
Stream 2	7766.2	247.9	6096.1	2777.9	2235.8	272.6	5570.3	26706.4
Stream 3	9913.4	671.2	4647.1	2482.6	6768.3	148.9	3930.2	15351.8
Stream 4	8888.4	757.3	3417.5	4030.7	4117.9	337.3	5497.8	25592.1
Stream 5	4575.5	342.8	3055.8	6105.6	4761.6	141.0	3884.9	23836.4
Stream 6	6819.2	810.1	5685.4	2760.7	5173.6	116.3	3304.4	16537.9
Stream 7	6771.8	504.9	3359.4	5817.4	5441.9	109.1	6817.2	16449.9
Min Qi	4575.5	247.9	3055.8	2482.6	2235.8	109.1	3304.4	15351.8
Max Qi	9913.4	810.1	7985.1	6105.6	6768.3	337.3	9809.8	26706.4
Avg Qi	7110.6	523.7	4892.3	3816.2	5008.5	185.3	5544.9	20525.9
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream 0	5085.8	655.4	224.5	666.0	728.7	149.4	110.9	269.1
Stream 1	24881.0	3884.3	1938.4	2515.1	2867.3	1770.4	621.7	1402.2
Stream 2	22466.1	1502.5	1547.3	1240.9	2090.5	1014.3	895.5	11631.2
Stream 3	21918.4	1455.2	1187.9	4072.0	4346.3	1530.9	696.4	1041.5
Stream 4	26293.5	1885.4	1781.2	7073.1	5259.5	265.2	428.2	4363.8
Stream 5	27790.3	2523.0	1743.7	2985.3	6042.0	2242.5	1802.6	910.8
Stream 6	26676.8	2126.5	1154.9	2585.6	11799.3	581.2	1218.3	1086.5
Stream 7	20358.2	2311.5	893.9	5266.4	4835.2	353.2	529.7	963.7
Min Qi	20358.2	1455.2	893.9	1240.9	2090.5	265.2	428.2	910.8
Max Qi	27790.3	3884.3	1938.4	7073.1	11799.3	2242.5	1802.6	11631.2
Avg Qi	24340.6	2241.2	1463.9	3676.9	5320.0	1108.2	884.6	3057.1
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	181.3	3214.4	283.2	125.7	3489.6	156.3	690.0	551.5
Stream 1	6008.3	13850.3	7339.4	5603.8	14292.7	750.5	142201.5	658.4
Stream 2	3249.4	12224.5	9833.9	993.8	17672.5	361.6	614.0	653.0
Stream 3	3303.4	17821.7	10310.0	2395.9	15363.0	346.1	580.8	653.7
Stream 4	2168.1	12446.2	3174.1	312.3	20485.4	1500.1	585.7	636.5
Stream 5	9883.8	17667.5	2404.8	1365.1	14542.5	692.1	636.5	655.1
Stream 6	7305.3	12097.8	8675.9	14830.5	9859.9	515.7	584.7	644.0
Stream 7	4470.1	20985.0	7555.1	2703.8	19381.7	337.7	582.7	641.6
Min Qi	2168.1	12097.8	2404.8	312.3	9859.9	337.7	580.8	636.5
Max Qi	9883.8	20985.0	10310.0	14830.5	20485.4	1500.1	142201.5	658.4
Avg Qi	5198.3	15299.0	7041.9	4029.3	15942.5	643.4	20826.6	648.9