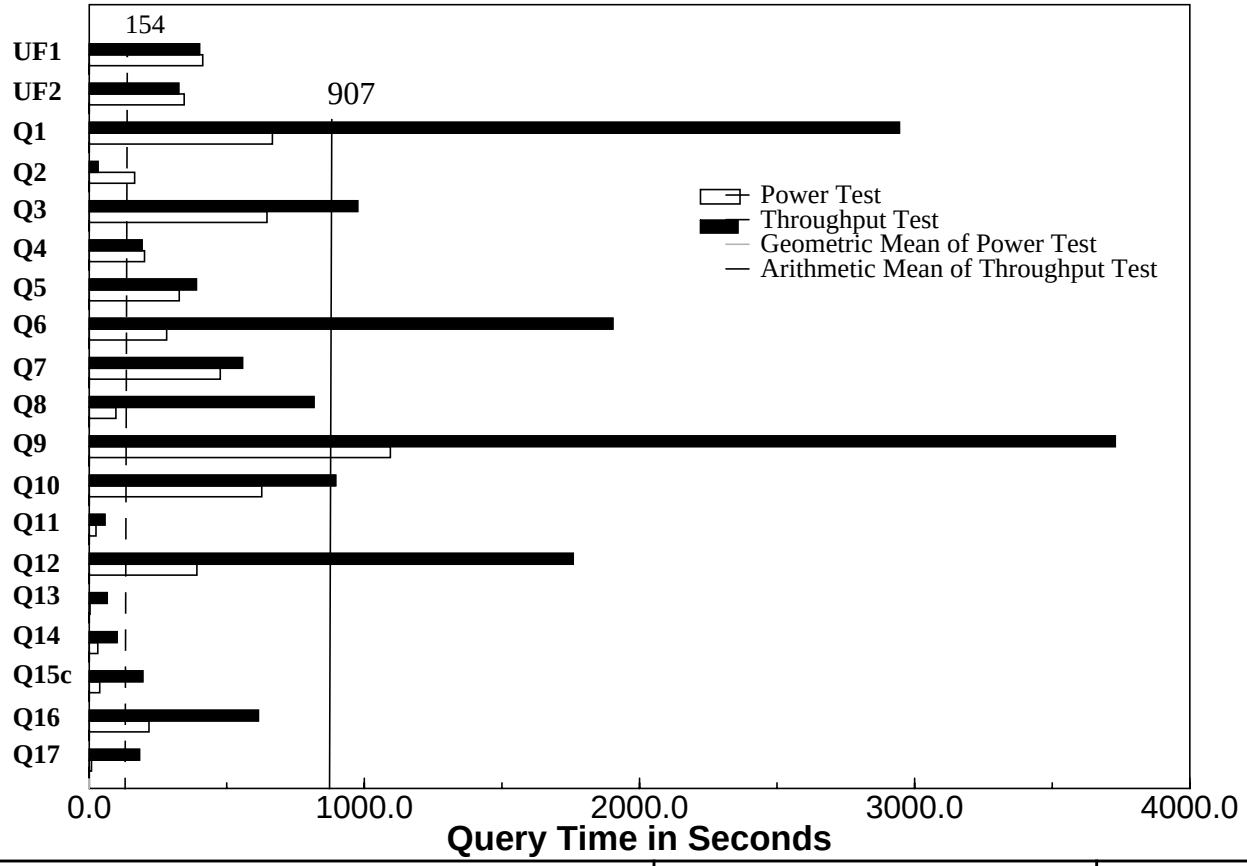
Sun Ultra Enterprise 6000 with DB2 for Solaris V5.0

TPC-D 1.2.3

Report Date: **Nov 18, 1997**

Total System Cost	TPC-D Power	TPC-D Throughput	Price/Performance	
$925,586	**702.8** QppD@30GB	**437.1** QthD@30GB	**$1670** $ per QphD@30GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date
30GB	**DB2 UDB for Solaris V5.0**	**Solaris 2.6**	**Sun Enterprise Volume Manager 2.5**	**March 31, 1998**



Database Load Time = 8 h 19m 16 s	Disk Size/Database Size = 16.80	RAID : Y

System Configuration:

- 8 250Mhz UltraSPARC CPUs with 4MB External Cache
- 5120 MB memory
- 1 Ethernet LAN controller
- 8 disk controllers
- 8 SSA112 RSM SPARCStorage Arrays, each with 30 2.1 GB drives.
- Total of 504 GB of storage

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Order Number	Description	Quantity	Unit Price	Extended Price	Maint. rate/unit	5 yr total Maint.
Server Hardware						
Pricing from CAT Technology, Inc.						
E6002	Ultra Enterprise 6000 Base Package	1	131250	131250	2937.6	158630
2601A	CPU/Memory Board	4	6750	27000	184.8	39917
2550A	UltraSPARC module,250Mhz, 4MI	8	14250	114000		
7023A	1024MByte memory expansion	5	21000	105000		
2610A	SBus I/O Board	2	4875	9750		
954A	Power/Cooling Module	2	1350	2700		
6592A	SSA 112 w/30*2.1GB disks	8	34050	272400	146.40	63245
1057A	Fiber Channel SBus Card	3	1200.00	3600		
595A	FibreChannel Optical Module	5	450	2250		
6104A	2.5GB 1/4" Internal Tape Drive	1	675	675		
	Ultra Enterprise 6000 Subtotal:			**668,625.00**		**261,792.00**
	ALL HARDWARE SUBTOTALS:			**668,625.00**		**261,792.00**
Sun Softwrore Pricing from Sun						
SOLS-C	Solaris Software on CD-ROM	1	100	100		
WCC-4.2-P	SPARCompiler Single User Licens	1	995	995	17	969.00
	Sun Software Subtotal:			**1,095.00**		**969.00**
DB2 Pricing from IBM DB2						
DB2 for Solaris Version 5	DB2 for Solaris Version 5.0	1	37610	37610		0.00
	DB2 Software Subtotal:			**37,610.00**		0.00
	ALL SOFTWARE SUBTOTALS:			**38,705.00**		**969.00**
Sun maintenance rate/unit is monthly rate						
H/W Maintenance includes 1 YR warranty (maintenance at 50%) & 4 YR Maintenance						
Discount						
Sun hardware maintenance multiyear 12% discount + 5% yea		17%				-44,504.64
	TOTAL HARDWARE AND SOFTWARE COST (5 YR)					**925,586.36**
	QphD@30GB					554.28
	Price Per Qphd@30GB					**1,669.90**

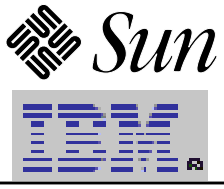
Notes:

"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 the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org".

Hardware available now. Solaris 2.6 will be available December 15, 1997. DB2 for Solaris V5 is available March 31, 1998.

Sun and IBM are proud to announce a TPC first: the results shown were obtained while running the TPC-D workload concurrently with a TPC-C workload on the same server (both results being audited and published separately on the same day). The TPC-C workload consisted of a 1350 warehouse database. Both workloads were run and audited on a Sun Microsystems Ultra Enterprise 6000 with 10GB of memory and 16 CPUs (5GB and 8 CPUs per workload) using DB2 Universal Database for Solaris V5.0.
The steady state period of the TPC-C run was 8 hours, in order to span the full duration of both the TPC-D power and throughput runs.

Audited By: Francois Raab, Information Paradigm, Inc.



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Numerical Quantity Summary

Measurement Results:

Database Scaling Factor (SF/Size)	= 30
Total Data Storage / Database Size	= 16.80
Database Load Time	= 8h 19 m 16 s
Query Streams for Throughput Test	= 5
Geometric Mean of Power Test	= 153.7
Arithmetic Mean of Throughput Test	= 906.9
TPC-D Power Metric (QppD@30GB)	= 702.8
TPC-D Throughput Metric (QthD@30GB)	= 437.1
Composite QphD@GB	= 554.3
Total System Price Over 5 Years	= $925,586
TPC-D Price/Performance Metric	= $1670

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	= 21,000 Seconds

Duration of Stream Execution:

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Total Time
Stream0	595034979	1997-11-15	00:09:08	1997-11-15	00:54:58	6056
Stream1	1038629071	1997-11-15	01:59:56	1997-11-15	06:22:27	15751
Stream2	903439130	1997-11-15	01:59:56	1997-11-15	06:33:09	16393
Stream3	1156557184	1997-11-15	01:59:56	1997-11-15	05:57:19	14244
Stream4	1409675346	1997-11-15	01:59:56	1997-11-15	05:42:15	13339
Stream5	1662780772	1997-11-15	01:59:56	1997-11-15	06:49:15	17359
Updates		1997-11-15	01:59:56	1997-11-15	07:49:56	21000

TPC-D Timing Intervals (in seconds)

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Stream0	665.6	164.9	646.0	201.2	327.3	281.9	476.5	97.1	1094.8	627.4
Stream1	3589.7	33.3	920.5	247.7	344.2	1377.4	521.4	1086.2	2988.9	987.7
Stream2	2639.5	34.2	915.0	179.3	342.3	1992.6	496.5	389.0	5280.0	943.0
Stream3	2570.8	34.6	947.3	162.1	425.1	2209.5	563.6	740.4	2598.5	1002.5
Stream4	2833.1	31.3	981.7	215.7	403.8	1647.5	645.6	935.0	2958.0	750.0
Stream5	3093.5	29.8	1117.1	157.2	434.3	2288.7	560.3	936.1	4821.4	798.2
Minimum	2570.8	29.8	915.0	157.2	342.3	1377.4	496.5	389.0	2598.5	750.0
Average	2945.3	32.6	976.3	192.4	389.9	1903.1	557.5	817.3	3729.4	896.3
Maximum	3589.7	34.6	1117.1	247.7	434.3	2288.7	645.6	1086.2	5280.0	1002.5

Stream ID	Q11	Q12	Q13	Q14	Q15	Q16	Q17	UF1	UF2
Stream0	24.8	391.8	2.8	31.5	38.5	217.5	8.2	413.0	345.2
Stream1	43.6	2368.4	31.9	120.9	131.7	840.8	116.9	385.4	324.4
Stream2	60.8	1858.5	87.7	122.2	549.8	326.8	176.0	408.4	314.0
Stream3	56.1	1243.9	62.1	118.2	129.5	1076.1	303.8	410.9	327.9
Stream4	73.3	745.3	82.3	115.3	124.9	608.1	188.7	400.2	330.4
Stream5	54.4	2579.7	63.6	32.0	38.7	225.4	128.9	402.4	331.3
Minimum	43.6	745.3	31.9	32.0	38.7	225.4	116.9	385.4	314.0
Average	57.6	1759.2	65.5	101.7	194.9	615.4	182.9	401.5	325.6
Maximum	73.3	2579.7	87.7	122.2	549.8	1076.1	303.8	410.9	331.3