



ORACLE®

TPC Benchmark™ D
Full Disclosure Report

Sun Enterprise™ 3500

Using

Oracle8i™

Submitted for Review

Jan 17, 1999

TPC Benchmark D Full Disclosure Report

First Printing

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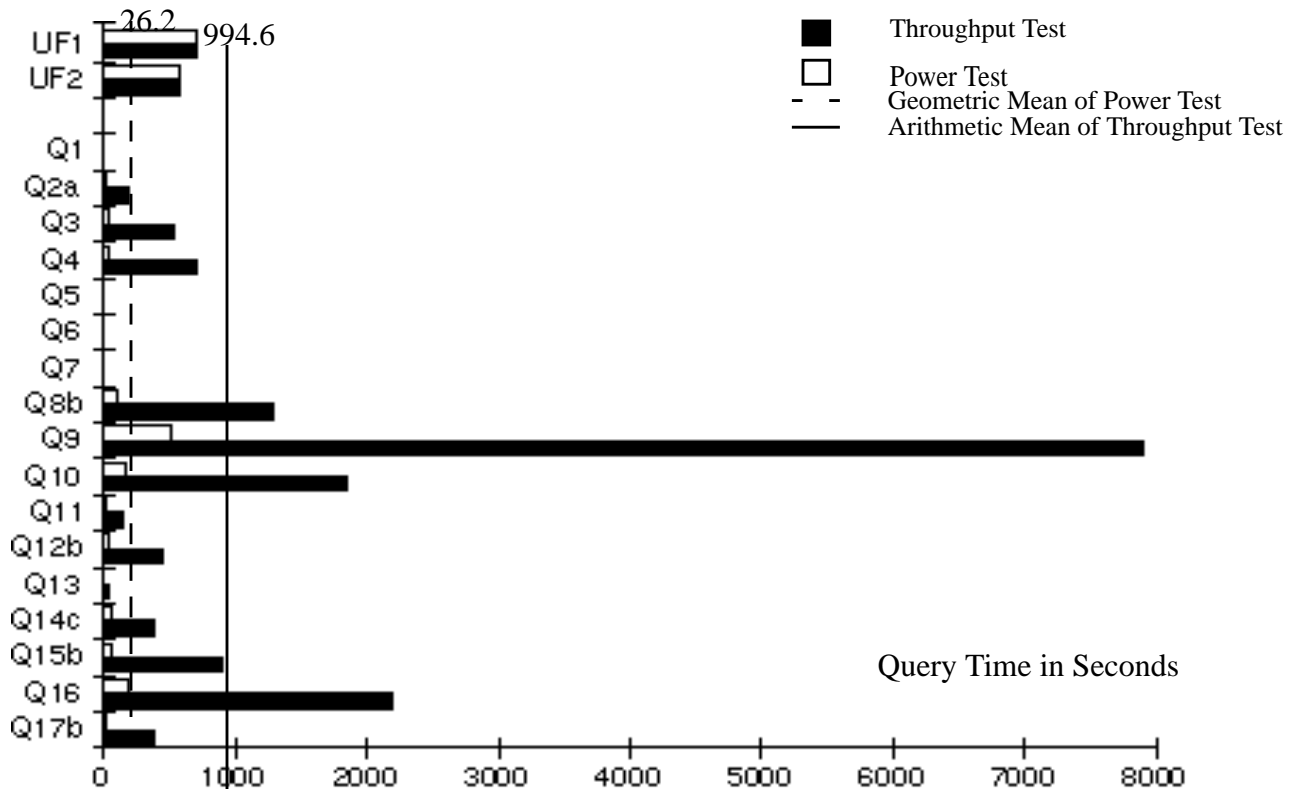


Sun Enterprise 3500 using Oracle8i

TPC-D 1.3.1

Report Date:
January 17, 1999

Total System Cost	TPC-D Power	TPC-D Throughput	Price/Performance	
\$1,079,778	13,738.7 QppD@100GB	2,551.0 QthD@100GB	\$182 per QphD@100GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	Oracle8i v8.1.5.1.1	Solaris 7	SEVM 3.0	May 18, 1999



Database Load Time = 25 hours 53 minutes

Disk Size/Database Size = 11.96

RAID : N

System Configuration:

- 8 400 Mhz UltraSPARC 64-bit CPUs each with 4MB Cache
- 8GBytes memory
- 9 Sun StorEdge A5000 with 14 x 9.1 GB drives each and 2 MultiPack with 6 X 4.2GB drives each



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Description	Part Number	Source	Unit Price	Qty	Disc	Ext. Price	5 Yr. Maint.
Server Hardware							
E3500 with 2 * 400Mhz/4MB cpus	E3500-C72	2	32,250	1		32,250	31,133
CPU/Memory board	2602A	2	6,750	3		20,250	35,770
400MHz/4MB UltraSPARC II	2570A	2	14,250	6		85,500	
1GB memory (8 * 128MB)	7023A	2	7,125	8		57,000	
PS/300W for Ex000	954A	2	1,350	2		2,700	
SBus I/O board	2612A	2	4,875	1		4,875	
FCAL SBus Host adapter	6730A	2	2,025	3		6,075	
FCAL GBIC Module	6731AR4	2	450	5		2,250	
Subtotal						210,900	66,902
Storage							
127GB StorEdge A5000 Array	SG-ARY-011A-127	2	47,250	9		425,250	166,925
StorEdge Multipack 6x4.2GB	SG-XDSK060A-25C	2	4,687	2		9,374	
SCSI Cable 68 pin	3856A	2	41	2		82	
Subtotal						434,706	166,925
SunService Discount (10% Volume + 5% yearly prepayment)							(35,074)
Hardware Subtotal						645,606	198,753
Software							
Solaris Server Software Media	SOLS-C	1	100	1		100	
SPARC Compiler C/C++ 4.2	WCC-4.2-P	1	995	1		995	969
Oracle8i License (Version 8.1)		3	100,320	1		100,320	133,280
Subtotal						101,315	134,249
SunService Discount (10% Volume + 5% yearly prepayment)							(145)
Software Subtotal						101,315	134,104
Notes:							
1. Sun Microsystems Inc.							
2. CAT Technology Inc							
3. Oracle Corp.							
Total						746,921	332,857
Service for all hardware and software (except for Oracle Server) is from Sun Microsystems Inc.						5Yr. cost	\$1,079,778
						QphD@100GB	5,920
						\$/QphD@100GB	\$182

Audited by: Francois Raab, Information Paradigm, 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 assumptions about past or future purchase 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 inform the TPC at pricing@tpc.org. Thank you.



Sun Enterprise 3500 using Oracle 8i

TPC-D 1.3.1

Report Date:
January 17, 1999

Numerical Quantity Summary

Measurement Results:

Database Scaling Factor (SF/Size)	= 100 GB
Total Data Storage / Database Size	= 11.96
Database Load Time	= 25 hours 53 minutes
Query Streams for Throughput Test	= 16
TPC-D Power Metric (QppD@100GB)	= 13,738.7
TPC-D Throughput Metric (QthD@100GB)	= 2,551.0
Composite QphD@100GB	= 5,920.1
Total System Price Over 5 Years	= \$1,079,778
TPC-D Price/Performance Metric	= \$182

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	= 38,385 seconds
Duration of Stream Execution:	

Stream ID	Seed	Start Date	Start Time	End Date	End Time
Stream00	1921152932	Friday Jan 8	09:56:35 PST	Friday Jan 8	10:39:37 PST
Stream01	604798093	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:15:25 PST
Stream02	288956000	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:36:09 PST
Stream03	2120597554	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:26:17 PST
Stream04	1804755459	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:02:17 PST
Stream05	1488913366	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:26:55 PST
Stream06	1173071271	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:03:00 PST
Stream07	857229178	Friday Jan 8	10:39:38 PST	Friday Jan 8	15:30:17 PST
Stream08	541387083	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:29:03 PST
Stream09	225544990	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:28:44 PST
Stream10	2057186544	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:21:58 PST
Stream11	1741344449	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:37:56 PST
Stream12	1425502356	Friday Jan 8	10:39:39 PST	Friday Jan 8	14:41:05 PST
Stream13	1109672411	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:34:23 PST
Stream14	793830320	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:23:45 PST
Stream15	477988227	Friday Jan 8	10:39:39 PST	Friday Jan 8	15:28:00 PST
Stream16	162146136	Friday Jan 8	10:39:40 PST	Friday Jan 8	15:17:49 PST
Updates		Friday Jan 8	15:37:58 PST	Friday Jan 8	21:19:23 PST

TPC-D Timing Intervals (in seconds)

	Q1	Q2a	Q3	Q4	Q5	Q6	Q7	Q8b	Q9	Q10
Stream00	0.2	26.9	48.5	45.6	0.7	0.1	0.7	99.2	503.5	158.4
Stream01	0.2	150.6	560.2	678.8	3.4	0.2	3.1	932.6	7849.6	1356.1
Stream02	0.9	221.5	792.2	676.0	4.3	0.4	5.5	763.6	7456.5	1883.6
Stream03	0.2	226.3	730.9	940.8	4.7	0.4	1.1	1370.2	7610.3	1980.9
Stream04	0.5	282.4	542.6	713.5	2.6	0.2	5.8	912.2	6805.2	1856.6
Stream05	0.3	205.6	555.2	749.0	1.1	0.2	4.5	2072.6	7609.6	1813.6
Stream06	0.4	220.1	536.0	685.7	3.5	0.2	0.2	871.3	6717.5	1785.7
Stream07	0.2	191.6	542.6	817.6	1.0	0.1	2.5	1382.2	8348.0	1851.4
Stream08	0.4	208.0	431.1	682.5	4.8	0.2	3.5	2088.4	7096.7	2078.5
Stream09	0.4	187.5	841.7	576.5	3.1	0.2	3.1	2152.8	7603.6	1963.9
Stream10	0.6	194.4	852.0	711.4	3.9	0.2	2.3	1384.5	7596.5	2049.5
Stream11	0.5	26.2	84.2	725.6	2.9	0.8	4.5	772.9	10645.5	1213.8
Stream12	0.6	221.5	496.3	681.2	4.3	0.2	2.7	1170.5	7095.0	1695.9
Stream13	0.2	30.5	51.91	957.1	0.6	1.7	0.7	782.2	10907.4	1881.6
Stream14	0.6	210.4	542.5	699.7	3.0	0.8	4.2	1346.7	7530.4	1609.2
Stream15	0.3	210.4	513.7	617.6	0.4	0.1	4.2	1189.9	7974.4	2668.6
Stream16	0.5	167.6	341.9	512.3	1.0	0.4	2.7	1235.5	7437.0	1769.1
Minimum	0.2	26.2	51.9	512.3	0.4	0.1	0.2	763.6	6717.5	1213.8
Average	0.4	184.7	525.9	714.1	2.8	0.4	3.1	1276.8	7892.6	1841.1
Maximum	0.9	282.4	852.0	957.1	4.8	1.7	5.8	2152.8	10907.4	2668.6

	Q11	Q12b	Q13	Q14c	Q15b	Q16	Q17b	UF1	UF2
Stream00	15.2	45.7	3.2	59.2	67.6	180.7	22.9	715.6	587.4
Stream01	183.1	542.4	38.9	351.8	972.9	2331.8	591.7	719.5	581.9
Stream02	165.7	477.5	26.2	557.3	2945.2	1497.4	317.3	703.0	586.2
Stream03	115.5	489.7	27.1	286.7	871.0	1922.2	620.5	686.3	573.8
Stream04	40.8	535.9	27.8	533.7	874.3	2300.5	324.0	697.0	582.0
Stream05	155.8	443.7	34.2	364.9	469.7	2381.9	374.4	699.2	581.4
Stream06	42.9	564.4	29.0	521.0	959.5	2528.5	335.8	685.7	577.0
Stream07	168.7	86.6	33.4	420.8	993.9	2177.1	420.9	763.6	575.0
Stream08	189.0	494.3	10.5	514.3	935.1	2410.3	216.7	688.2	580.4
Stream09	152.9	443.6	26.4	311.0	358.0	2549.4	171.6	690.0	586.8
Stream10	151.2	558.3	41.1	323.9	716.1	2099.4	254.0	684.6	580.3
Stream11	146.2	45.9	35.1	564.2	936.3	2523.8	168.6	700.0	582.1
Stream12	187.0	511.2	45.8	293.2	956.0	798.9	325.4	688.9	587.2
Stream13	174.6	547.4	3.4	64.9	78.5	1963.0	238.1	683.6	582.0
Stream14	132.6	483.6	33.9	302.7	821.6	2542.5	781.3	679.8	586.9
Stream15	144.2	382.5	75.8	234.7	578.8	2449.1	255.9	684.3	583.6
Stream16	156.8	491.2	67.5	499.9	808.8	2569.3	627.7	689.9	591.4
Minimum	40.8	45.9	3.4	64.9	78.5	798.9	168.6	679.8	573.8
Average	144.2	443.6	34.8	384.1	892.2	2190.3	376.5	696.5	582.4
Maximum	189.0	564.4	75.8	564.2	2945.2	2569.3	781.3	763.6	591.4



Information Paradigm

TPC TRANSACTION PROCESSING
PERFORMANCE COUNCIL
Certified Auditor

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Sun Microsystems, Inc.
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January 15, 1999

I verified the TPC Benchmark™ D performance of the following configuration:

Platform: Sun Ultra Enterprise 3500
DataBase Manager: Oracle8i Version 8.1.5.1.1
Operating System: Solaris Version 7

The results were:

CPU's Speed	Memory	Disks	QppD@100GB	QthD@100GB
Sun Ultra Enterprise 450				
8 x UltraSPARC (400 MHz)	4 MB L2 8 GB Main	12 x 4.2 GB (int.) 126 x 9.1 GB (ext.)	13,738.7	2,551.0

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark. The following verification items were given special attention:

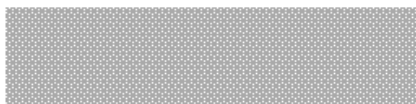
- The TIME table was not used
- The input variables were generated by QGEN
- The database was populated using DBGEN
- The database was maintained by the "Evolve" method
- The throughput metric was computed using the results from 16 query streams
- The ratio between the longest and the shortest query was such that some adjustments were necessary
- A compliant implementation specific layer was used
- The query text was produced using compliant variants and minor modifications

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- The database records were defined with the proper layout and size
 - The database was properly scaled to 100 GB and populated accordingly
 - The database load time was correctly measured and reported
 - The ACID Properties were verified and met
 - The reported execution times were correctly measured and reported
 - Measurement repeatability was verified
 - At least 8 hours of database log was configured
 - The system pricing was verified for major components and maintenance
 - The major pages from the FDR were verified for accuracy

Additional Audit Notes:

Respectfully Yours,



François Raab
President

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