



**Sun Fire™ V480 Server
with Sybase IQ 12.5**

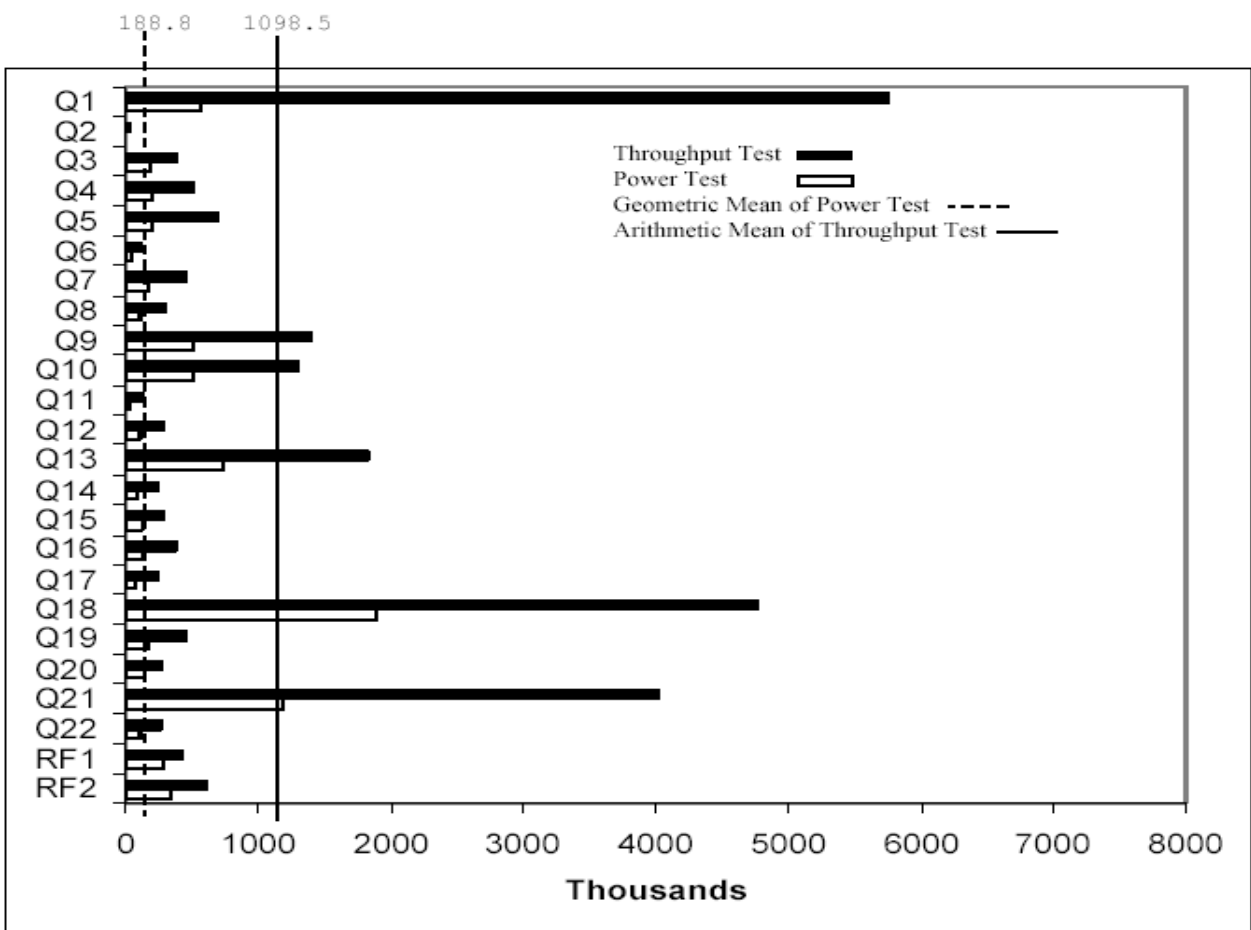
TPC-H Rev. 2.0



March 31 2003

Total System Cost	Composite Query per Hour Metric	Price/Performance
\$105,382	1760.5 QphH@100GB	\$60 \$/QphH@100GB

Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	Sybase IQ 12.5	Solaris 9	Solaris Volume Manager	March 31 2003



Database Load Time = 4:22

Load Includes Backup: N

Total Data Storage/Database Size=4.07

RAID (Base tables): Y

RAID (Base tables and auxiliary data structures): Y

RAID (All): N

System Configuration: Sun Fire™ V480 Server
 Processors: 4 UltraSPARC™ III Cu 900 MHz processors
 Memory: 16GB memory
 Disks: 2 internal 36.4 GB, 1 3310 (10x36.4GB plus 2x36.4 spares)
 Total Storage: 406.8 GB (in this calculation one GB is defined as 1024*1024*1024 bytes)



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Description	Part Number	Source	Unit Price	Qty	Ext. Price	3 Yr. maint.
Server Hardware						
Sun Fire V480 (4*900MHz, 16GB mem, 2*36GB disks 10k rpm)	A37-WSP4-16GQB		46,995	1	46,995	16,848
2 Meter SCSI Cable	X1138A		95	2	190	0
PCI dual ultra-3 SCSI HBA	X6758A		800	1	800	0
Server Hardware discount				1	-6,200	-1,813
<i>Server Hardware Subtotal</i>					41,785	15,035
Storage						
Sun StorEdge 3310 (12*36.4 GB 10k rpm)	XTA3310T01A0R436		11,995	1	11,995	0
Storage discount				1	-3,309	0
<i>Storage Subtotal</i>					8,686	0
Server Software						
Solaris 9 Std Media	SOLZS-00AC9AYS		50	1	50	
Solaris discount				1	-14	
Sybase IQ 12.5 license (for 1-4 processors including 3 years support)			24,000	1	30,000	15,840
Sybase discount (licence and support)				2	-6,000	
<i>Server Software Subtotal</i>					24,036	15,840
			Total		74,507	30,875
Service for all Sun products is from Sun Microsystems, Inc.			3 Yr. Cost		105,382	
Service for Sybase products is from Sybase Inc.			QphH@100GB		1,760.50	
			\$/QphH@100GB		\$60	

Notes (Source):

1. Sun Microsystems, Inc.
2. Sybase Inc. contact Deborah Harrington (see Appendix G)

Audited by: Brad Askins, InfoSizing, Inc. (www.sizing.com)

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the standard 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 that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.



**Sun Fire™ 15K Server
with Sybase IQ 12.5**

TPC-H Rev. 2.0

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Numerical Quantities

Measurement Results:

Database Scale Factor	= 100GB
Total Data Storage / Database Size	= 4.07
Start of database load time	= 2003-03-26 15:05:49
End of database load time	= 2003-03-26 19:26:50
Database Load Time	= 4:22
Query Streams for Throughput Test	= 5
TPC-H Power	= 1907.0
TPC-H Throughput	= 1625.3
TPC-H Composite Query-per-Hour Rating (QphH@100GB)	= 1760.5
Total System Price Over 3 Years	= \$105,382
TPC-H Price/Performance Metric (\$/QphH@100GB)	= \$60

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	= 24,364 seconds
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Duration of Stream Execution:

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Duration
Stream 00	326192650	Mar 27, 2003	04:42:01	Mar 27, 2003	06:55:13	02:13:12
Stream 01	326192651	Mar 27, 2003	06:55:20	Mar 27, 2003	13:33:53	06:38:33
Stream 02	326192652	Mar 27, 2003	06:55:23	Mar 27, 2003	13:36:13	06:40:50
Stream 03	326192653	Mar 27, 2003	06:55:27	Mar 27, 2003	13:40:32	06:45:05
Stream 04	326192654	Mar 27, 2003	06:55:30	Mar 27, 2003	13:39:25	06:43:55
Stream 05	326192655	Mar 27, 2003	06:55:35	Mar 27, 2003	13:41:17	06:45:42
Refresh		Mar 27, 2003	06:55:13	Mar 27, 2003	12:07:18	05:12:05



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TPC-H Timing Intervals (in seconds)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	571.1	22.0	189.5	200.6	202.4	42.2	173.5	112.8	509.9	504.0	37.7	109.6
Stream 01	5,873.4	28.9	314.6	475.3	760.4	74.9	328.0	235.8	1,206.2	1,234.2	112.7	249.2
Stream 02	5,264.7	53.9	411.2	331.8	765.1	240.8	432.6	221.0	1,572.0	1,813.6	88.6	299.9
Stream 03	7,180.0	29.1	239.7	639.4	548.1	79.3	776.6	674.6	1,431.6	800.1	54.6	206.9
Stream 04	5,307.0	24.1	436.7	562.0	952.2	87.4	391.7	186.2	1,585.5	1,505.2	73.2	307.0
Stream 05	5,139.0	51.9	519.4	506.1	453.1	90.3	410.6	232.8	1,253.7	1,198.4	277.1	397.8
Minimum	5139.0	24.1	239.7	331.8	453.1	74.9	328.0	186.2	1206.2	800.1	54.6	206.9
Average	5752.8	37.6	384.3	502.9	695.8	114.5	467.9	310.1	1409.8	1310.3	121.2	292.1
Maximum	7180.0	53.9	519.4	639.4	952.2	240.8	776.6	674.6	1585.5	1813.6	277.1	397.8

	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	730.7	88.2	120.9	122.9	81.1	1895.1	178.6	140.7	1195.8	109.6	287.8	353.8
Stream 01	1491.7	200.9	470.2	277.4	146.3	5035.8	304.6	264.5	4646.6	179.8	584.7	682.0
Stream 02	1776.1	278.4	257.6	421.8	307.5	4714.6	521.9	273.7	3632.1	369.7	385.8	595.7
Stream 03	2033.6	246.8	195.2	337.6	200.1	4932.9	531.8	185.8	2788.6	190.8	416.2	714.5
Stream 04	2082.9	264.7	280.9	255.4	326.1	4377.8	442.5	246.9	4173.1	364.4	383.7	537.6
Stream 05	1816.5	191.3	190.6	641.6	180.4	4776.3	495.9	421.8	4833.7	262.1	415.7	506.2
Minimum	1491.7	191.3	190.6	255.4	146.3	4377.8	304.6	185.8	2788.6	179.8	383.7	506.2
Average	1840.2	236.4	278.9	386.8	232.1	4767.5	459.3	278.5	4014.8	273.4	437.2	607.2
Maximum	2082.9	278.4	470.2	641.6	326.1	5035.8	531.8	421.8	4833.7	369.7	584.7	714.5

Benchmark Sponsors:

Brad Carlile Director, Enterprise Benchmarking Sun Microsystems, Inc. 8305 S. W. Creekside Place Beaverton, OR 97008	Eric Miles Sr. VP & General Manager Sybase Business Intelligence 561 Virginia Road Concord, MA 01742
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March 30, 2003

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

Platform: **Sun Fire V480 Server**
Database Manager: **Sybase IQ 12.5**
Operating System: **Solaris 9**

The results were:

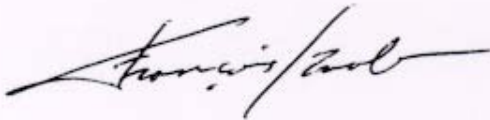
CPU (Speed)	Memory	Disks	QphH@100GB
Sun Fire 480			
4 x UltraSPARC III Cu (900 MHz)	16 GB Main	12 x 36.4 GB	1760.5

In my opinion, this performance result was produced in compliance with the TPC's requirements for the benchmark. The following verification items were given special attention:

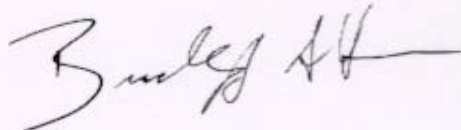
- The database records were defined with the proper layout and size
- The database population was generated using DBGEN
- The database was properly scaled to 100GB and populated accordingly
- The compliance of the database auxiliary data structures was verified
- The database load time was correctly measured and reported

- The required ACID properties were verified and met
- The query input variables were generated by QGEN
- The query text was produced using minor modifications and one variant
- The execution of the queries against the SF1 database produced compliant answers
- A compliant implementation specific layer was used to drive the tests
- The throughput tests involved 5 query streams
- The ratio between the longest and the shortest query was such that no query timing was adjusted
- The execution times for queries and refresh functions were correctly measured and reported
- The repeatability of the measured results was verified
- The required amount 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

Respectfully Yours,



François Raab, President



Bradley J. Askins, Auditor

CAT TECHNOLOGY

Sales Proposal

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 P.O. Box 39000
 San Francisco, CA 94139-3237

Proposal No. SFOQ15124

Revised 03/20/03

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Sun Microsystems
 Jay Halloran

Phone: 781-442-2635

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Terms

Ship To:

Sun Microsystems
 Jay Halloran
 TPC-H benchmark

CUSTOMER IS RESPONSIBLE FOR PAYING TAX & SHIPPING CHARGES, THESE CHARGES WILL BE BILLED ON THE INVOICE

Item	Mfr.	Part No.	Qty	Description	List Price	Unit Price	Ext. Price
1	Sun Microsystems ms	A37-WSPF4-16GQB	1	SUN FIRE V480 4X900MHZ, 16GB, 2X36GB DISKS, 1inch, 10k rpm, FC AL disks, DVD, 2 power supplies	\$46,995.00	\$41,039.30	\$41,039.30
2	Sun Microsysteme ms	XTA3310T01A0R436	1	Order X311L separately - - Sun StorEdge 3310 SCSI array tabletop	\$11,995.00	\$8,686.47	\$8,686.47
3	Sun Microsysteme ms	X6758A	1	PCI dual channel Ultra 3 differential SCSI host adapter	\$800.00	\$579.34	\$579.34
4	Sun Microsysteme ms	X1138A	2	Cable SCSI VHDCI 2m	\$95.00	\$82.96	\$165.92
5	Sun Microsysteme ms	SOLZS-09AC9AYS	1	Solaris 9, rel may 02, FCS Slim Kit Contains Multilingual CD and DVD media with minimal documentation no bonus Software SPARC Platform Edition	\$50.00	\$36.21	\$36.21

Remit Payments To:

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 P.O. Box 39000
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Sub Total	\$50,507.24
Sales Tax	\$0.00
Estimated Shipping	\$0.00
Total	\$50,507.24

Company
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Quotation for Software and Support
 4 cpu Server

SYBASE Sales Rep: Hollie Nash
 Phone: 972-687-6412
 Fax: 972-687-6409

CBSS#

Line	Quantity	Product Description	License Type	Machine	P/S	List Price Per Unit	Discount % **	Net Unit Price	Net Extended Price	Net Extended Support Fee 3 YEAR
1	1	Sybase IQ-M Single App Svr - 4 cpus	SR	Sum	P	\$ 30,000	20%	24,000	24,000	15,840
2	1	Extended support/24 x 7								
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
Sub-total										\$ 24,000.00
Total										\$ 39,840.00

Quote Date:
 Valid thru:

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\$ 39,840.00 License + 3 year maintenance