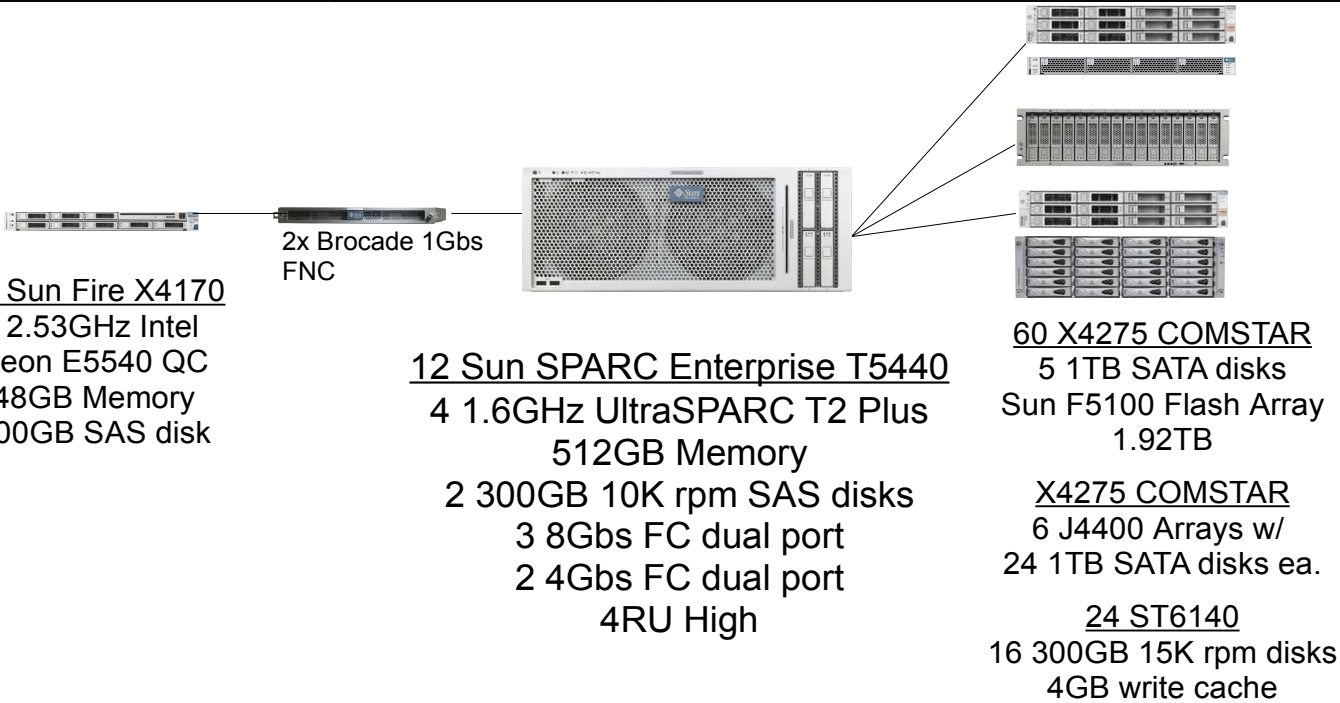
	Sun SPARC Enterprise T5440 Cluster with Oracle Database 11g with Real Application Clusters and Partitioning			TPC-C 5.10.1 TPC-Pricing 1.5.0	
				Report Date November 3, 2009 Revised December 22, 2009	
Total System Cost	TPC-C Throughput	Price/Performance		Availability Date	
\$18,083,745 USD	7,646,486.7 tpmC	\$2.36 USD/tpmC		3/19/2010	
Database Server Processors/Cores/Threads	Database Manager	Operating System	Other Software	Number of Users	
UltraSPARC T2 Plus 1.6GHz 48 / 384 / 3072	Oracle Database 11g Enterprise Ed. With Real Application Clusters and Part.	Solaris 10 10/09	Tuxedo CFS-R Tier 1 Sun One Java Web Server 7.1	6,048,000	
 <p>24 Sun Fire X4170 2 2.53GHz Intel Xeon E5540 QC 48GB Memory 300GB SAS disk</p> <p>2x Brocade 1Gbs FNC</p> <p>12 Sun SPARC Enterprise T5440 4 1.6GHz UltraSPARC T2 Plus 512GB Memory 2 300GB 10K rpm SAS disks 3 8Gbs FC dual port 2 4Gbs FC dual port 4RU High</p> <p>60 X4275 COMSTAR 5 1TB SATA disks Sun F5100 Flash Array 1.92TB</p> <p>X4275 COMSTAR 6 J4400 Arrays w/ 24 1TB SATA disks ea.</p> <p>24 ST6140 16 300GB 15K rpm disks 4GB write cache</p>					
System Component	Each Server Node			Each Client	
Processors/Cores/Threads and cache	4/32/256	UltraSPARC T2 Plus 1.6GHz 4 MB L2 Cache		2/8/16	Intel Xeon E5540 8MB LLC Cache
Memory		512GB (6TB Total all nodes)			48GB
Disk Controllers	3 2	8Gbs FC Dual Port 4Gbs FC Dual Port		1	8 port Internal SAS
OS Disks (each system)	2	300GB 10K rpm 2.5" SAS		1	300GB 10K rpm 2.5" SAS
Disk Drives (Equally visible to all T5440 nodes)	4800 384 449	24GB SSD Flash Modules 300GB 15K rpm 2.5" SAS 1TB 7.2K rpm 3.5" SATA			
Total Storage		686.6TB			

Description	Part Number	Price Source	Unit Price	Qty	Extended Price	Discounted Price	3 yr Maint. Price
Server Hardware							
T5440, XATO base chasis, 4 PSUs	SEVASY11Z		1 5,000	12	60,000	45,600	
Pwr Jumper Cables, 2.5mx1 RoHS	X9238-1-A		1 10	12	120	91	
4Gb FC dual port	SG-XPCIE2FC-QF4		1 1,995	24	47,880	33,995	
8Gb FC dual port	SG-XPCIE2FC-EM8-Z		1 2,399	36	86,364	61,318	
Sun PCI-E Dual 10 GigE Fibre	X1027A-Z		1 995	12	11,940	9,074	
SE 300GB 10K 2.5 SAS HDD	SEVY3G11Z		1 689	24	16,536	12,567	
T5440 8C 1.6Ghz, 32GB 667Mhz	SEVX1ED1Z		1 29,200	48	1,401,600	1,065,216	
SE 16GB FBDIMM (2*8GB) MEM	SESX2D1Z		1 3,900	288	1,123,200	853,632	
T5440 Disk Filler Panel	SEVY9MF1Z		1 0	24	0	0	
T5440 DVD Filler Panel	SEVY9DF1Z		1 0	12	0	0	
SE T5x20 EXPRESS RAIL KIT	SESX9RK2Z		1 150	12	1,800	1,476	
APC Smart-UPS XL 3000VA + 2 additional batteries (+2 entire spares)	SUA3000R3XLNETPKG + 2 SUA48RMXLBP3U		4 3,123	14	43,722	43,722	
3 year 7x24 Gold support for T5440	IWU-T5440-4P-24-3G		1 25,851	12			310,210
	Sub-Total					2,082,970	310,210
Server Storage							
X4275 3.5-inch base 1 x PSU	X4275-S1-AA		1 2,895	61	176,595	134,212	
Open Solaris 2009.06 pre-install	5902A		1 0	61	0	0	
Jumper Cable Kit: 1 x 1m C13	XSR-JUMP-1MC13		1 23	61	1,403	1,066	
3.5inch 1TB STAT7.2K RPM HDD	RA-ST1CR-1T7K		1 659	305	200,995	152,756	
8Gb FC dual port	SG-XPCIE2FC-QF8-Z		1 2,399	20	47,980	34,066	
8Gb FC single port	SG-XPCIE1FC-QF8-Z		1 1,249	41	51,209	36,358	
8-port External SAS/SATA HBA	SG-XPCIE8SAS-E-Z		1 550	244	134,200	95,282	
8-port Internal SAS/SATA HBA	SG-PCIE8SAS-I-Z		1 249	61	15,189	10,784	
1 x Intel Xeon E5540 (2.53GHz)	5863A		1 1,199	61	73,139	55,586	
AC PSU 1050W	6328A		1 245	61	14,945	11,358	
X4270 CPU Filler Panel XATO	5896A		1 0	61	0	0	
2GB (1 x 2GB) DDR3-1066	5866A		1 105	183	19,215	14,603	
3.5-inch HDD Filler Panel XATO	5897A		1 0	427	0	0	
X4275 Slide Rail Kit XATO	5889A		1 150	61	9,150	7,503	
DIMM slot filler panel	5879A		1 0	915	0	0	
X4270 X4275 CPU Heatsink XATO	5899A		1 0	61	0	0	
SF X4275 3Yr Gold 7x24 Sys Svc	IWU-X4275-24-3G		1 2,447	61			149,241
0.5M, Mini, shielded, SAS cable	XTA25X0-0.5M-SAS-Z		1 95	244	23,180	19,008	
Sun Storage F5100 Flash Array	TA5100RASA4-80A		1 159,995	60	9,599,700	6,623,793	
3Yr Gold support for F5100	GOLD-STK-SVC		1 5,385	60			323,071
ST6140A-4-4800G-1x1x16x300J-RR	XTC6140R11A2J4800Z		1 63,615	24	1,526,760	946,591	
ST6140 7x24 3yr Gold support	IWU-ST6140-4-24-3G		1 3,672	24			88,136
APC Smart-UPS 2200VA RM 2U 120V 120V (+2 spares)	SUA2200RM2U		4 1,150	14	16,100	16,100	
15M LC-LC FC Optical Cable	X9734A-Z		1 105	258	27,090	14,087	
J4400 array, 24x3.5" 7.2K rpm 1TB SATA	XTA4400R00A2N24		1 28,295	6	169,770	139,211	
6m, Mini, shielded, SAS cable	XTA-6.0M-SAS		1 325	6	1,950	1,599	
STK J4400 7x24 UG 3Y GOLD	IWU-STJ4400-24-3G		1 2,131	6	12,788		12,788
Sun Rack II 42U	XSR-1242E		1 2,849	7	19,943	16,353	
PDU 15kVA, Single Phase, LV	XSR-15K-L630		1 1,200	14	16,800	13,776	
24x7 3 year Gold support for SR-II 42U	IWU-SR-1242-24-3H		1 818	7			5,726
Slide Rail Kit for Sun Rack II	XTA6000-RK2-RAIL		1 175	90	15,750	12,915	
	Sub-Total					8,357,009	578,962
Server Software							
Solaris 10 10/09 for T5440	SEVY9SD1Z		1 0	12	0	0	
Oracle 11g Ent. Ed., Per Processor, Unlimited Users for 3 years			3 23,750	192	4,560,000	4,560,000	
Real Applications Clusters, Per Processor, Unlmt Users for 3 years			3 11,500	192	2,208,000	2,208,000	
Partitioning, Per Processor, Unlimited Users for 3 years			3 5,750	192	1,104,000	1,104,000	
Oracle Incident Server Support Package for 3 years			3 27,600	3			82,800
	Sub-Total					7,872,000	82,800

Description	Part Number	Price Source	Unit Price	Qty	Extended Price	Discounted Price	3 yr Maint. Price
Client Hardware							
X4170 1 x Standard PSU	X4170-S1-AA		1	2,095	24	50,280	38,213
Jumper Cable Kit: 1 x 1m C13	XSR-JUMP-1MC13		1	23	24	552	420
4GB (1 x 4GB) DDR3-1066	5867A		1	190	288	54,720	41,587
300GB 10K RPM 2.5" SAS disk	RA-SS2CF-300G10K		1	689	24	16,536	12,567
8-port Internal SAS HBA	SG-PCIE8SAS-I-Z		1	249	24	5,976	4,243
1 x Intel Xeon E5540 (2.53GHz)	5863A		1	1,199	48	57,552	43,740
Drive Bay Filler Panel	6331A		1	0	168	0	0
DVD Drive Bay Panel	6332A		1	0	24	0	0
Slide Rail Kit	6326A		1	150	24	3,600	2,952
DIMM slot filler panel	5879A		1	0	144	0	0
X4170 CPU Heatsink, XATO	5898A		1	0	48	0	0
Sun Rack II 42U	XSR1242E		1	2,849	2	5,698	4,672
PDU 15kVA, Single Phase, LV	XSR-15K-L630		1	1,200	4	4,800	3,936
24x7 3 year Gold support for X4170	IWU-X4170-24-3G		1	2,288	24		54,910
24x7 3 year Gold support for SR-II 42U	IWU-SR-1242-24-3H		1	818	2		1,636
						Sub-Total	152,330
							56,546
Client Software							
Solaris 10 10/09 for X4170	5894A		1	0	24	0	0
Sun JS WS 7.0u5			1	1,000	24	24,000	24,000
Sun JS WS 7.0u5 3 year support				500	24		12,000
Tuxedo CFS-R Tier 1			3	1,800	24	43,200	43,200
Oracle Premium Support for 3 years (Tuxedo CFS-R Tier 1)			3	9,504	3		28,512
						Sub-Total	67,200
							40,512
Other Hardware							
Brocade 5300 with 8G SFP EB	SG-XSWBRO5300-8EB		1	149,794	3	449,382	368,493
Brocade Std Switch Rack Kit	SG-XSWBRO3X50-RK-Z		1	250	6	1,500	1,230
Brocade 5300 80Pt 3yr 24x7 Gold maint.	IWU-BR53EB80-24-3G		1	23,681	3	71,042	71,042
Brocade Turbolron 24X w/ 24pt 1GBE	FOU-TI-24X-AC		2	9,035	1	9,035	9,035
Brocade TI-24X-GOLD	FOU-TI-24X-GOLD		2	1,090	3		3,270
Sun 10GbE SFP+ SR Transceiver (+2 spares)	X5561A-Z		1	250	14	3,500	2,870
Brocade FastIron GS 48Pt 10/100/1000	FNC-FGS648P-STK		2	6,150	3	18,450	18,450
Brocade Technet GOLD Supt FastIron	FOU-GOLD_FGS648P		2	810	9		7,290
NETGEAR GS748T (+ 2 spares)	CDW: 698653		2	600	7	4,200	4,200
SUT Mgmt system and Svc Processor Control Workstation							
Ultra 27 WS XATO Base	B27-AA		1	775	1	775	589
Ultra 27 Solaris 10 Pre-Install	3922A		1	0	1	0	0
NVIDIA FX 380	3921A		1	155	1	155	118
24-inch LCD Monitor	X7236A		1	649	1	649	493
1 x 2GB 1066MHz Ultra 27	3915A		1	135	3	405	308
500GB 7200 rpm 3.5" SATA	RB-ST1CE-500G7K		1	309	1	309	235
U27 SATA DVD-Dual	4133A-Z		1	110	1	110	84
Xeon 2.66GHz for Ultra 27	3913A		1	495	1	495	376
Ultra 27 3Yr 24x7 Gold Support	IWU-B27-24-3G		1	1,751	1		1,751
						Sub-Total	406,481
							83,353
Oracle Mandatory E-Business Discount			3				(\$2,006,628)
Totals						\$16,931,361	\$1,152,384
Three-Year Cost of Ownership:							\$18,083,745
						tpmC	7,646,486.77
						\$/tpmC	\$2.36
Audited by Francois Raab of InfoSizing, 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 purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing section of the TPC benchmark specifications. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org . Thank you.							

Numerical Quantity Summary

MQTh, computed Maximum Qualified Throughput 7,646,486.77 tpmC

Response Time in Seconds	<u>90th %</u>	<u>Avg.</u>	<u>Max.</u>
New-Order	0.170	0.168	5.885
Payment	0.160	0.156	5.758
Order-Status	0.150	0.150	5.433
Delivery (Interactive)	0.120	0.134	3.869
Delivery (Deferred)	0.040	0.021	2.839
Stock-Level	0.210	0.182	4.796
Menu	0.120	0.136	4.474

Response Time delay added for emulated components 0.1

Transaction Mix, in percent of total transactions

New-Order	44.87%
Payment	43.04%
Order-Status	4.02%
Delivery	4.03%
Stock-Level	4.04%

Keying / Think Times (in seconds)

	<u>Min.</u>		<u>Avg.</u>		<u>Max.</u>	
New-Order	18.010	0.000	18.011	12.019	18.082	120.212
Payment	3.010	0.000	3.010	12.020	3.090	120.215
Order-Status	2.010	0.000	2.010	10.023	2.025	100.211
Delivery	2.010	0.000	2.010	5.020	2.025	50.210
Stock-Level	2.010	0.000	2.010	5.021	2.023	50.210

Test Duration

Ramp-up Time	3,360 seconds
Measurement Interval	7,320 seconds
Number of Checkpoints	Ongoing
Checkpoint Interval	Ongoing Incremental Checkpoints
Number of transactions (all types) completed in Measurement Interval	2,079,196,221