

<b>UNISYS</b>	<b>ES7000 Model 7600R G2 Enterprise Server (4s)</b>		<b>TPC-E 1.9.0 TPC Pricing 1.5.0</b>
			Report Date: July 09, 2010
TPC-E Throughput <b>2022.64 tpsE</b>	Price/Performance <b>\$382.33 USD per tpsE</b>	Availability Date <b>July 30, 2010</b>	Total System Cost <b>\$773,305 USD</b>
<b>Database Server Configuration</b>			
Operating System <b>Microsoft Windows Server 2008 R2 Enterprise Edition</b>	Database Manager <b>Microsoft SQL Server 2008 R2 Enterprise Edition</b>	Processors/Cores/ Threads <b>4/32/64</b>	Memory <b>1024GB</b>
<p>The diagram illustrates the server architecture. A Driver and Time Server are connected to a central Gigabit Switch. The switch is connected to a Tier A server and a Storage Unit (SUT). The SUT is connected to a Tier B server rack via a 12 SAS connection. The Tier B rack contains multiple server units.</p>			
<b>IBM x3500 M2</b> - 2 x Intel Xeon Processor X5570 2.93GHz (2 Procs/8 Cores/16 Threads) - 8GB Memory - 2 x 160GB SFF SATA (RAID-1) - 1 x IBM ServeRAID-BR10i - Onboard Gigabit Ethernet - 1 x 10Gb Ethernet	<b>ES7000 Model 7600R G2</b> - 4 x Intel Xeon Processor X7560 2.26GHz (4 Procs/32 Cores/64 Threads) - 1TB Memory - 2 x 160GB SFF SATA (RAID-1) - 6 x 300GB SFF SAS (RAID-10) - 1 x 7600R G2 Adv. BBU RAID - 6 x 7600R G2 ServeRAID M5025 - Onboard Gigabit Ethernet - 1 x 10Gb Ethernet	<b>84 x IBM System Storage EXP3000 Enclosure</b> Four contain: - 12 x 300GB 3.5" 15K SAS 80 contain: - 12 x 146GB 3.5" 15K SAS = 42 x 24-drive RAID-10 <b>1008 Total External Drives</b>	
Initial Database Size <b>8,512 GB</b>	Redundancy Level: <b>1 RAID-10 Log &amp; Data</b>		Storage <b>960 x 146 GB 54 x 300 GB 2 x 160 GB</b>



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Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
<b>Server Hardware</b>						
ES77600R G2 4x X7560, 128GB (8x16GB) - incl 4x Memory Cards	ES7624231-SVR	1	53,993	1	53,993	1,250
ES77600R G2 128GB (8x16GB) - incl 4x Memory Cards	ES7624121-ICA	1	15,447	1	15,447	
ES77600R G2 128GB (8x16GB) Memory Expansion	ES7624121-MEM	1	14,251	6	85,506	
ES77600R G2 Adv. BBU RAID with 8x 2.5" SFF	ES7620281-IDK	1	799	1	799	
ES77600R G2 160GB 7.2K NL SATA 2.5" SFF HS HDD	ES7620011-DSK	1	259	2	518	
ES77600R G2 300GB 10K 6Gbps SAS 2.5 SFF	ES7621021-DSK	1	559	6	3,354	
ES77600R G2 ServeRAID M5025 SAS/SATA Controller	ES7620101-PCE	1	649	6	3,894	
Rack mounted USB keyboard, mouse and monitor	ES70004-SUI	1	1,868	1	1,868	
ES77600R G2 Single-port SFP+ 10GbE x8 Adapter	ES7620111-PCE	1	1,499	1	1,499	
<b>Subtotal</b>					<b>166,878</b>	<b>1,250</b>
<b>Server Storage</b>						
NetBAY S2 42U Standard Rack Cabinet	93074RX	2	1,609	5	8,045	
System Storage EXP3000 Enclosure	172701X	2	3,199	84	268,716	
1M SAS cable	39R6529	2	119	72	8,568	
3M SAS cable	39R6531	2	135	12	1,620	
IBM 300GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	44W2234	2	599	48	28,752	
146GB 15K 3.5" Hot-Swap SAS	40K1044	2-S	359	960	344,640	
3 Year Onsite Repair 24x7 4 Hour Response (EXP3000)	41L2768	2	760	84		63,840
3 Year Onsite Repair 24x7 4 Hour Response (Rack)	41L2760	2	300	5		1,500
<b>Subtotal</b>					<b>660,341</b>	<b>65,340</b>
<b>Server Software</b>						
Microsoft SQL Server 2008 R2 Enterprise x64 Edition		3	19,188	4	76,752	
Microsoft Windows Server 2008 R2 Enterprise x64 Edition	P72-04217	3	2,280	1	2,280	
Microsoft Problem Resolution Services	N/A	3	259	1		259
<b>Subtotal</b>					<b>79,032</b>	<b>259</b>
<b>Client Hardware</b>						
System x3500 M2 with 1 x Intel Xeon Processor X5570 (2.93GHz / 1MB L2 Cache / 8MB L3 Cache) 2x 1GB Memory	783982U	2	3,845	1	3,845	
Intel Xeon Processor X5570 (2.93GHz/1MB L2/8MB L3 Cache)	46D1357	2	2,135	1	2,135	
2GB (1x2GB) DualRank PC3-10600 DDR3-1333 LP RDIMM	44T1481	2	125	4	500	
ServeRAID-BR10i SAS/SATA Controller	44E8689	2	229	1	229	
160GB 7200 NL SATA 2.5" SFF Slim-HS HDD	42D0747	2	259	2	518	
Single-Port SFP+ 10GbE PCI-E x8 Adapter	46M1809	2	1,499	1		1,499
3 Year Onsite Repair 24x7 4 Hour Response	21P2078	2	600	1		600
<b>Subtotal</b>					<b>7,227</b>	<b>2,099</b>
<b>Client Software</b>						
Microsoft Windows Server 2008 R2 Standard x64 Edition	P73-04980	3	711	1	711	
<b>Subtotal</b>					<b>711</b>	<b>0</b>
<b>Infrastructure</b>						
1M Fibre Optic Cable LC-LC	39M5696	2	79	1	79	
<b>Subtotal</b>					<b>79</b>	<b>0</b>
<b>Total</b>					<b>914,268</b>	<b>68,948</b>

Dollar Volume Discount (see note 1)

28.56%

<b>Three-Year Cost of Ownership USD:</b>	<b>\$773,305</b>
<b>TPC-E Throughput:</b>	<b>2,022.64</b>
<b>\$ USD/tps:</b>	<b>\$382.33</b>

Pricing: 1 - Unisys; 2 - IBM; 3 - Microsoft  
S: One or more components of the measured configuration have been substituted in the priced configuration. See the FDR for details.

Note 1: Discount applies to all items where Pricing=2.

Original publication audited by Doug Johnson of Infosing Inc. This result 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 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.



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**Numerical Quantities Summary**

<b>Reported Throughput: 2022.64 tpsE</b>		<b>Configured Customers: 1,050,000</b>		
<b>Response Time (in seconds)</b>	<b>Minimum</b>	<b>Average</b>	<b>90<sup>Th</sup> Percentile</b>	<b>Maximum</b>
Broker-Volume	0.01	0.05	0.09	1.72
Customer-Position	0.01	0.03	0.06	2.19
Market-Feed	0.01	0.03	0.05	17.06
Market-Watch	0.01	0.03	0.07	2.46
Security-Detail	0.01	0.02	0.03	2.16
Trade-Lookup	0.01	0.40	0.60	3.34
Trade-Order	0.01	0.08	0.12	2.77
Trade-Result	0.01	0.09	0.15	14.72
Trade-Status	0.01	0.02	0.04	2.45
Trade-Update	0.01	0.45	0.61	10.32
Data-Maintenance	0.01	0.07	N/A	0.32
<b>Transaction Mix</b>		<b>Transaction Count</b>	<b>Mix %</b>	
Broker-Volume		7,135,411	4.900	
Customer-Position		18,930,528	13.000	
Market-Feed		1,456,309	1.000	
Market-Watch		26,211,229	18.000	
Security-Detail		20,386,162	14.000	
Trade-Lookup		11,649,210	8.000	
Trade-Order		14,707,405	10.100	
Trade-Result		14,563,015	10.001	
Trade-Status		27,667,569	19.000	
Trade-Update		2,912,297	2.000	
Data-Maintenance		120	N/A	
<b>Test Duration and Timings</b>				
Ramp-up Time (hh:mm:ss)			00:35:53	
Measurement Interval (hh:mm:ss)			02:00:00	
Business Recovery Time (hh:mm:ss)			00:39:39	
Total Number of Transactions Completed in Measurement Interval			145,619,135	