


	Lenovo® ThinkSystem™ SR950		TPC-E™ 1.14.0 TPC Pricing 2.1.1
			Report Date: Nov 6, 2017 Revision Date: Nov 6, 2017
TPC-E Throughput 11,357.28 <small>tpsE™</small>	Price/Performance \$98.83 <small>USD per tpsE</small>	Availability Date November 6, 2017	Total System Cost \$1,122,410 <small>USD</small>
Database Server Configuration			
Operating System Microsoft® Windows Server® 2016 Standard Edition	Database Manager Microsoft SQL Server® 2017 Enterprise Edition	Processors/Cores/Threads 4/112/224	Memory 3072GB
			
 4 x 10Gb Ethernet		 6 x 12Gb SAS x12	
TIER A (Client) 1 x Lenovo System x3650 M5, with: <ul style="list-style-type: none"> - 2 x Intel® Xeon® Processor E5-2699 v4 2.20GHz (2 Procs/44 Cores/88 Threads) - 64GB Memory - 2 x 600GB SFF SAS (RAID-1) - 1 x ServeRAID M5210 - 1 x Onboard Quad Gb Ethernet - 3 x Intel x540 Dual 10Gb-T Ethernet 	TIER B (Database Server and Storage) 1 x Lenovo ThinkSystem SR950, with: <ul style="list-style-type: none"> - 4 x Intel Xeon Platinum 8180 Processor 2.50GHz (4 Procs/112 Cores/224 Threads) - 3072GB Memory - 2 x 800GB SAS SSD (RAID-1) - 8 x 800GB SAS SSD (RAID-10) - 1 x ThinkSystem RAID 930-16i - 6 x ThinkSystem RAID 930-8e - 1 x Onboard Dual Gb Ethernet - 1 x Broadcom NX-E Dual 10Gb-T - 3 x Intel x550 Dual 10Gb-T Ethernet 	6 x Lenovo Storage D1224 DAS Enclosures, with: <ul style="list-style-type: none"> - 106 x 800GB 2.5" SAS SSD (6 x 17-drive RAID-5) (1 x 4-drive RAID-10) - 3 x 1200GB 2.5" 10K SAS (1 x 3-drive RAID-5) 109 Total External Drives	
Initial Database Size 49,276 GB	Redundancy Level: 1 RAID-10 Log, tempdb RAID-5 Data, 60-Day Space	Storage 3 x 1200GB 2.5" 10K SAS 116 x 800GB 2.5" SAS SSD	



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Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware						
ThinkSystem SR950 Configure-To-Order, includes:	7X12CTO1WW	1	220,142	1	220,142	
SR950 2S to 4S Base + Main I/O Planar	AUNY, AJUMT			1		
Intel Xeon Platinum 8180 28C 205W 2.5GHz Processor	AX6G			4		
ThinkSystem 64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	AUNE			48		
ThinkSystem 2.5" SAS/SATA 2x2 Bay Backplane Kit	AUN6			3		
ThinkSystem RAID 930-16i 4GB Flash PCIe 12Gb Adapter	AUNK			1		
ThinkSystem 2.5" 800GB Mainstream SAS 12Gb Hot Swap SSD	AUMD			2		
ThinkSystem 2.5" 800GB Performance SAS 12Gb Hot Swap SSD	AUMH			8		
ThinkSystem SR950 (4) x8 PCIe Riser	AUN2			2		
ThinkSystem 1Gb 2-port RJ45 LOM	AUKG			1		
ThinkSystem Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter	AUKQ			1		
Intel X550-T2 Dual Port 10GBase-T Adapter	ATPX			3		
ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	AUNQ			6		
High Efficiency 1600W Power Supply for SR950 (200-240VAC only)	AUPJ			4		
Power Cable	6311			4		
FBU345 SuperCap	AUNP			7		
ThinkSystem SR950 2-CPU, 24 DIMM Compute System Board	AUN0			2		
Front operator panel with LCD display	AUMW			1		
Rail Kit + SR950 Lift Handles	A4AA, AUMY			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR950)	5PS7A01828	1	1,999	1		1,999
				Subtotal	220,142	1,999
Server Storage						
Lenovo Storage D1224 SFF Chassis, Dual ESM	4587A31	1	2,999	6	17,994	
External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	00YL848	1	59	12	708	
Lenovo Storage 800GB 10 DWD 2.5" SAS SSD	01DC452	1 S	2,999	106	317,894	
Lenovo Storage 1.2TB 10K 2.5" SAS HDD	01DC407	1	989	3	2,967	
Essential Service - 3Yr 24x7 4Hr Response (D1224)	01JR577	1	1,169	6		7,014
				Subtotal	339,563	7,014
Server Software						
SQL Server 2017 Enterprise Edition (2 Core License)	N/A	2	13,472.50	56	754,460	
Windows Server 2016 Standard Edition (2 Core License)	N/A	2	92	56	5,152	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
				Subtotal	759,612	259
Client Hardware						
System x3650 M5 Configure-To-Order, includes:	8871AC1	1	21,033	1	21,033	
System x3650 M5 Base + Planar + Power Paddle Card	ATDY, ATE4, A5FT			1		
System x 750W High Efficiency Platinum AC Power Supply	A5EU			2		
Intel Xeon Processor E5-2699 v4 22C 2.2GHz 55MB Cache 2400MHz 145W	ATF2, ATFT			2		
System x3650 M5 PCIe Risers 1 & 2 + Thermal Kit	A5FQ, A5R6, ASQD			1		
System x Gen-II Universal Slides Kit	A5FW			1		
600GB 10K 12Gbps SAS 2.5" G3HS HDD	AT8A			2		
x3650 M5 8x 2.5" HS HDD Assembly Kit (Single RAID)	A5G6			1		
8GB TruDDR4 Memory (2Rx8, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	ATC9			8		
Power Cable	6311			2		
ServeRAID M5210 SAS/SATA Controller	A3YZ			1		
Intel X540-T2 Dual Port 10GBaseT Adapter	A2ED			2		
Intel X540 ML2 Dual Port 10GbaseT Adapter	A40P			1		
System x3650 M5 Riser Bracket	A5G5			2		
System x3650 M5 EIA L- Blank, Right EIA, & EIA Plate	ATEA, A5V5, A5G1			1		
System x3650 M5 Single Rotor Fan	ATEC			4		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (x3650 M5)	01GX547	1	1,114	1		1,114
				Subtotal	21,033	1,114
Client Software						
Windows Server 2016 Standard Edition (2 Core License)	N/A	2	92	22	2,024	
				Subtotal	2,024	0
Infrastructure						
S2 42U Standard Rack	93074RX	1	1,565	1	1,565	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with line cord	00YJ776	1	479	1	479	
Preferred Pro Keyboard USB - US English 103P RoHS v2	00AM600	1	29	1	29	
2 Button Optical Wheel Mouse - Black - USB	40K9200	1	19	1	19	
ThinkVision E2054 19.5-inch LED Backlit LCD Monitor	60DFAAR1US	1	119	1	119	
1.0m CAT6 Green Cable	00WE127	1	19	4	76	
Essential Service - 3Yr 24x7 4Hr Response (Rack)	41L2760	1	315	1		315
				Subtotal	2,287	315
				Total	1,344,661	10,701
Dollar Volume Discount (See Note 1)		39.25%	1		232,952	

Pricing: 1 - Lenovo 1-877-782-7134; 2 - Microsoft

Note 1: Discount applies to all line items where Pricing=1; pricing is for these or similar quantities. Discounts for similarly sized configurations will be similar to what is quoted here, but may vary based on the specific components priced.

S: One or more components of the measured configuration have been substituted in the priced configuration. See the FDR for details.

Benchmark results and test methodology audited by Doug Johnson for 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 stated Line Items. 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 Line Items. For complete details, see the pricing section of the TPC Benchmark Standard. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Three-Year Cost of Ownership USD:	\$1,122,410
TPC-E Throughput:	11,357.28
\$ USD/tpsE:	\$98.83



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Numerical Quantities Summary

Reported Throughput:
11,357.28 tpsE

Configured Customers:
6,000,000

Response Time (in seconds)	Minimum	Average	90 th Percentile	Maximum
Broker-Volume	0.01	0.01	0.02	0.44
Customer-Position	0.01	0.01	0.02	2.24
Market-Feed	0.01	0.01	0.02	2.23
Market-Watch	0.01	0.01	0.02	0.43
Security-Detail	0.01	0.01	0.01	0.43
Trade-Lookup	0.01	0.04	0.06	0.60
Trade-Order	0.01	0.03	0.07	0.63
Trade-Result	0.01	0.02	0.04	0.59
Trade-Status	0.01	0.01	0.01	0.43
Trade-Update	0.01	0.05	0.07	0.52
Data-Maintenance	0.01	0.01	N/A	0.05

Transaction Mix	Transaction Count	Mix %
Broker-Volume	40,068,102	4.900%
Customer-Position	106,302,916	13.000%
Market-Feed	8,177,257	1.000%
Market-Watch	147,188,055	18.000%
Security-Detail	114,479,771	14.000%
Trade-Lookup	65,416,789	8.000%
Trade-Order	82,588,501	10.100%
Trade-Result	81,772,482	10.000%
Trade-Status	155,365,918	19.000%
Trade-Update	16,354,137	2.000%
Data-Maintenance	120	N/A

Test Duration and Timings

Ramp-up Time (hh:mm:ss)	00:43:46
Measurement Interval (hh:mm:ss)	02:00:00
Business Recovery Time (hh:mm:ss)	00:35:57
Total Number of Transactions Completed in Measurement Interval	817,713,928