


	Lenovo® ThinkSystem™ SR650		TPC-E™ 1.14.0 TPC Pricing 2.4.0
			Report Date: April 2, 2019 Revision Date: April 2, 2019
TPC-E Throughput 7,012.53 <small>tpsE™</small>	Price/Performance \$90.99 <small>USD per tpsE</small>	Availability Date April 17, 2019	Total System Cost \$638,052 <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 2/56/112	Memory 1536GB
			
			
			
TIER A (Client) 1 x Lenovo ThinkSystem SR650, with: <ul style="list-style-type: none"> - 2 x Intel® Xeon® Platinum 8168 Processor 2.70GHz (2 Procs/48 Cores/96 Threads) - 96GB Memory - 2 x 300GB SFF SAS (RAID-1) - 1 x ThinkSystem RAID 930-8i - 1 x Onboard Dual Gb Ethernet - 1 x Intel x550 Dual 10Gb-T Ethernet - 2 x Broadcom NX-E Dual 10Gb-T Enet 		TIER B (Database Server and Storage) 1 x Lenovo ThinkSystem SR650, with: <ul style="list-style-type: none"> - 2 x Intel Xeon Platinum 8280 Processor 2.70GHz (2 Procs/56 Cores/112 Threads) - 1536GB Memory - 2 x 800GB SAS SSD (RAID-1) - 6 x 800GB SAS SSD (RAID-10) - 1 x ThinkSystem RAID 930-8i - 4 x ThinkSystem RAID 930-8e - 1 x Onboard Dual Gb Ethernet - 2 x Intel x550 Dual 10Gb-T Ethernet 	
		4 x Lenovo Storage D1224 DAS Enclosures, with: <ul style="list-style-type: none"> - 74 x 800GB 2.5" SAS SSD (4 x 17-drive RAID-5) (1 x 6-drive RAID-10) 	
		74 Total External Drives	
Initial Database Size 29,145 GB	Redundancy Level: 1 RAID-10 Log, tempdb RAID-5 Data	Storage 82 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 SR650 Configure-To-Order, includes:	7X06CTO1WWW	1	141,024	1	141,024	
ThinkSystem SR650 2.5" Chassis with 8, 16 or 24 bays	AUVV			1		
Intel Xeon Platinum 8280 28C 205W 2.7GHz Processor	B4H7			2		
ThinkSystem 64GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	B5N8			24		
ThinkSystem 2U/Twr 2.5" SATA/SAS 8-Bay Backplane	AURA			1		
ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	AUNJ			1		
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	B4A0			2		
ThinkSystem 2.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD	AUMH			6		
ThinkSystem 2U x8/x8/x8 PCIe FH Riser 1	AUR4			1		
ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit	AURC			1		
ThinkSystem 1Gb 2-port RJ45 LOM	AUKG			1		
Intel X550-T2 Dual Port 10GBase-T Adapter	ATPX			2		
ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	AUNQ			4		
ThinkSystem Toolless Slide Rail	AXCA			1		
ThinkSystem 2U left EIA Latch Standard	AURD			1		
ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply	AWWF			2		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	6400			2		
Lenovo ThinkSystem 2U 3FH Riser Bracket	AURQ			1		
Lenovo ThinkSystem 2U 2FH Riser Bracket	AURP			1		
FBU345 SuperCap	AUNP			5		
ThinkSystem SR650 Refresh MB	B4NL			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR650)	5PS7A01558	1	2,079	1		2079
				Subtotal	141,024	2,079
Server Storage						
Lenovo Storage D1224 SFF Chassis, Dual ESM	4587A31	1	2,999	4	11,996	
External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	00YL848	1	59	8	472	
Lenovo Storage 800GB 10 DWD 2.5" SAS SSD	01DC452	1	2,999	74	221,926	
Essential Service - 3Yr 24x7 4Hr Response (D1224)	01JR577	1	1,169	4		4,676
				Subtotal	234,394	4,676
Server Software						
SQL Server 2017 Enterprise Edition (2 Core License)	N/A	2	13,472.50	28	377,230	
Windows Server 2016 Standard Edition (2 Core License)	N/A	2	92	28	2,576	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
				Subtotal	379,806	259
Client Hardware						
ThinkSystem SR650 Configure-To-Order, includes:	7X06CTO1WWW	1	32,215	1	32,215	
ThinkSystem SR650 2.5" Chassis with 8, 16 or 24 bays	AUVV			1		
Intel Xeon Platinum 8168 24C 205W 2.7GHz Processor	AWDJ			2		
ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM	AUU1			12		
ThinkSystem 2U/Twr 2.5" SATA/SAS 8-Bay Backplane	AURA			1		
ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	AUNJ			1		
ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	AULY			2		
ThinkSystem 2U x8/x8/x8 PCIe FH Riser 1	AUR4			1		
ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit	AURC			1		
ThinkSystem 1Gb 2-port RJ45 LOM	AUKG			1		
ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	AUKP			2		
Intel X550-T2 Dual Port 10GBase-T Adapter	ATPX			1		
ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply	AWWF			2		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	6400			2		
ThinkSystem Toolless Friction Rail	AXFM			1		
ThinkSystem 2U left EIA Latch Standard	AURD			1		
Lenovo ThinkSystem Mainstream MB - 2U	AUQB			1		
Lenovo ThinkSystem 2U 3FH Riser Bracket	AURQ			1		
Lenovo ThinkSystem 2U 2FH Riser Bracket	AURP			1		
FBU345 SuperCap	AUNP			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR650)	5PS7A01558	1	2,079	1		2,079
				Subtotal	32,215	2,079
Client Software						
Windows Server 2019 Standard Edition (2 Core License)	N/A	2	123	24	2,952	
				Subtotal	2,952	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 NEMA L6-30P line cord	00YJ776	1	479	1	479	
ThinkSystem Keyboard w/ Int. Pointing Device USB - US Eng 103P RoHS v2	7ZB7A05470	1	99	1	99	
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	2,338	315
				Total	792,729	9,408
Dollar Volume Discount (See Note 1)	39.15%	1			164,085	

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.

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: \$638,052
TPC-E Throughput: 7,012.53
\$ USD/tpsE: \$90.99



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Numerical Quantities Summary

Reported Throughput:
7,012.53 tpsE

Configured Customers:
3,550,000

Response Time (in seconds)	Minimum	Average	90 th Percentile	Maximum
Broker-Volume	0.01	0.01	0.02	0.31
Customer-Position	0.01	0.01	0.02	3.62
Market-Feed	0.01	0.02	0.04	3.62
Market-Watch	0.01	0.01	0.01	0.28
Security-Detail	0.01	0.01	0.01	0.27
Trade-Lookup	0.01	0.04	0.06	0.34
Trade-Order	0.01	0.03	0.05	0.32
Trade-Result	0.01	0.03	0.05	0.31
Trade-Status	0.01	0.01	0.01	0.31
Trade-Update	0.01	0.05	0.07	0.35
Data-Maintenance	0.01	0.02	N/A	0.04

Transaction Mix	Transaction Count	Mix %
Broker-Volume	24,739,811	4.900%
Customer-Position	65,635,811	13.000%
Market-Feed	5,049,028	1.000%
Market-Watch	90,880,788	18.000%
Security-Detail	70,684,757	14.000%
Trade-Lookup	40,391,307	8.000%
Trade-Order	50,994,302	10.100%
Trade-Result	50,490,226	10.000%
Trade-Status	95,929,354	19.000%
Trade-Update	10,097,957	2.000%
Data-Maintenance	120	N/A

Test Duration and Timings

Ramp-up Time (hh:mm:ss)	03:05:33
Measurement Interval (hh:mm:ss)	02:00:00
Business Recovery Time (hh:mm:ss)	00:25:39
Total Number of Transactions Completed in Measurement Interval	504,893,341