
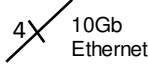
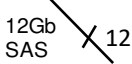


	Lenovo® ThinkSystem™ SR860 V2		TPC-E™ 1.14.0 TPC Pricing 2.6.0
			Report Date: Nov 19, 2020 Revision Date: Nov 19, 2020
TPC-E Throughput 12,162.59 <small>tpsE™</small>	Price/Performance \$84.96 <small>USD per tpsE</small>	Availability Date November 19, 2020	Total System Cost \$1,033,292 <small>USD</small>
Database Server Configuration			
Operating System Microsoft® Windows Server® 2016 Standard Edition	Database Manager Microsoft SQL Server® 2019 Enterprise Edition	Processors/Cores/Threads 4/112/224	Memory 3072GB
			
			
			
TIER A (Client) 1 x Lenovo ThinkSystem SR650, with: <ul style="list-style-type: none"> - 2 x Intel Xeon Gold 6248R Processor 3.00GHz (2 Procs/48 Cores/96 Threads) - 96GB Memory - 2 x 300GB 10K SAS HDD (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 SR860 V2, with: <ul style="list-style-type: none"> - 4 x Intel Xeon Platinum 8380H Processor 2.90GHz (4 Procs/112 Cores/224 Threads) - 3072GB Memory - 2 x 480GB SATA SSD (RAID-1) - 14 x 800GB SAS SSD (RAID-10) - 1 x ThinkSystem RAID 940-16i - 6 x ThinkSystem RAID 930-8e - 1 x Onboard Dual 10Gb-T Ethernet - 3 x Broadcom NX-E Dual 10Gb-T Enet 	
		6 x Lenovo Storage D1224 DAS Enclosures, with: <ul style="list-style-type: none"> - 126 x 800GB 2.5" SAS SSD (6 x 21-drive RAID-5) 	
		126 Total External Drives	
Initial Database Size 53,385 GB	Redundancy Level: 1 RAID-10 Log, tempdb RAID-5 Data	Storage 140x 800GB 2.5" SAS SSD 2x 480GB 2.5" SATA SSD	



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Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware						
ThinkSystem SR860 V2 Configure-To-Order, includes:	7Z60CTO1WW	1	195,722	1	195,722	
SR860 V2 4U Chassis Base	BAVW			1		
Front Operator Panel with Quad Line LCD Display	BAVU			1		
ThinkSystem SR850/SR860 V2 Platinum 8380H 28C 250W 2.9GHz Processor	BB99			4		
ThinkSystem 64GB TruDDR4 3200 MHz (2Rx4 1.2V) RDIMM	B966			48		
ThinkSystem Raid 940-16i 8GB Flash PCIe Gen4 12Gb Adapter	B8NZ			1		
ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	B8HU			14		
ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	B8JM			2		
ThinkSystem 2U 8x2.5" SAS/SATA Backplane	B8LU			1		
ThinkSystem 2U/4U 8x2.5" AnyBay Backplane	B8LM			1		
ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	B5ST			1		
ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	AUKP			3		
ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	AUNQ			6		
ThinkSystem SR850/SR860 V2 x16/x16/x16 PCIe FH Riser 1	BAW7			1		
ThinkSystem SR860 V2 x8/x8/x8 PCIe FH Riser 2/3	BAW9			2		
ThinkSystem 1100W (230V/115V) v2 Platinum Hot-Swap Power Supply	B8QC			4		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	6400			4		
ThinkSystem SR860 V2 Rail Kit	BAWH			1		
Fan Slot1/3/4/6 Performance	BAW0			4		
Fan Slot2/5 Performance	BAW1			2		
SR860 V2 System Board	BAVT			1		
ThinkSystem SR860v2 Power Paddle	BAVZ			1		
FBU345 SuperCap	AUNP			7		
ThinkSystem SR850/SR860 V2 Processor and Memory Expansion Tray	BAVY			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR860 V2)	5PS7A73812	1	2,729	1		2,729
				Subtotal	195,722	2,729
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 3DWD 2.5" SAS SSD	01DC477	1	2,499	126	314,874	
Essential Service - 3Yr 24x7 4Hr Response (D1224)	01JR577	1	1,169	6		7,014
				Subtotal	333,576	7,014
Server Software						
SQL Server 2019 Enterprise Edition (2 Core License)	N/A	2	13,748	56	769,888	
Windows Server 2016 Standard Edition (2 Core License)	N/A	2	113	56	6,328	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
				Subtotal	776,216	259
Client Hardware						
ThinkSystem SR650 Configure-To-Order, includes:	7X06CTO1WW	1	19,575	1	19,575	
ThinkSystem SR650 2.5" Chassis with 8, 16 or 24 bays	AUVV			1		
Intel Xeon Gold 6248R 24C 205W 3.0GHz Processor	BAZQ			2		
ThinkSystem 8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	B4H1			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	AVWF			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		
ThinkSystem SR650 Refresh MB	B4NL			1		
Lenovo ThinkSystem 2U 3FH & 2FH Riser Brackets	AURQ, AURP			1		
FBU345 SuperCap	AUNP			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR650)	5PS7A01558	1	2,079	1		2,079
				Subtotal	19,575	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	
OU 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776	1	479	1	479	
ThinkSystem Pref. Pro II USB Keyboard - US English	AXTL	1	29	1	29	
ThinkSystem Optical Wheel Mouse - USB	B0LN	1	19	1	19	
Lenovo D22-20 21.5-inch LED Backlit LCD Monitor	66ADKCC1US	1	90	1	90	
1.0m CAT6 Green Cable	00WE127	1	19	4	76	
Essential Service - 3Yr 24x7 4Hr Response (Rack)	41L2760	1	315	1		315
				Subtotal	2,258	315
				Total	1,330,299	12,396
Dollar Volume Discount (See Note 1)		54.93%	1			
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:		\$1,033,292
				TPC-E Throughput:		12,162.59
				\$ USD/tpsE:		\$84.96



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Numerical Quantities Summary

Reported Throughput:
12,162.59 tpsE

Configured Customers:
6,500,000

Response Time (in seconds)	Minimum	Average	90 th Percentile	Maximum
Broker-Volume	0.01	0.01	0.02	0.81
Customer-Position	0.01	0.01	0.02	3.90
Market-Feed	0.01	0.01	0.02	3.74
Market-Watch	0.01	0.01	0.01	0.29
Security-Detail	0.01	0.01	0.01	0.22
Trade-Lookup	0.01	0.04	0.06	0.28
Trade-Order	0.01	0.04	0.11	2.01
Trade-Result	0.01	0.01	0.02	2.17
Trade-Status	0.01	0.01	0.01	0.71
Trade-Update	0.01	0.04	0.06	0.28
Data-Maintenance	0.01	0.01	N/A	0.02

Transaction Mix	Transaction Count	Mix %
Broker-Volume	42,909,058	4.900%
Customer-Position	113,839,490	13.000%
Market-Feed	8,757,077	1.000%
Market-Watch	157,624,115	18.000%
Security-Detail	122,596,915	14.000%
Trade-Lookup	70,054,706	8.000%
Trade-Order	88,444,321	10.100%
Trade-Result	87,570,676	10.000%
Trade-Status	166,380,337	19.000%
Trade-Update	17,513,650	2.000%
Data-Maintenance	120	N/A

Test Duration and Timings

Ramp-up Time (hh:mm:ss)	00:22:03
Measurement Interval (hh:mm:ss)	02:00:00
Business Recovery Time (hh:mm:ss)	00:31:53
Total Number of Transactions Completed in Measurement Interval	875,690,345