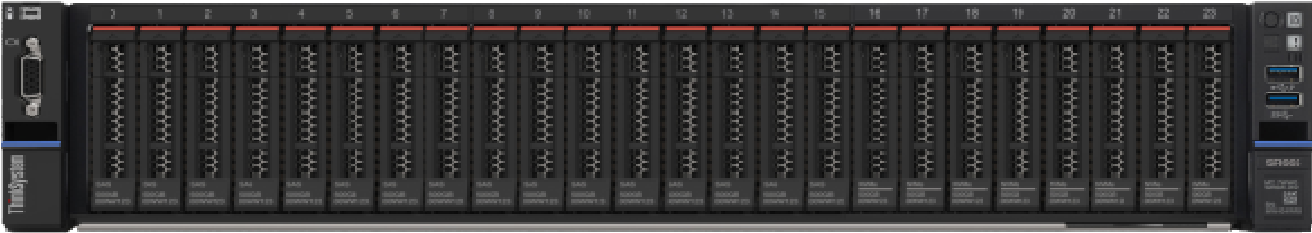
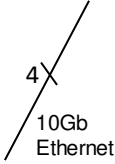
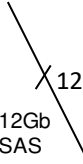


	Lenovo® ThinkSystem™ SR665		TPC-E™ 1.14.0 TPC Pricing 2.7.0
			Report Date: Mar 15, 2021 Revision Date: Mar 15, 2021
TPC-E Throughput 12,028.02 tpsE™	Price/Performance \$91.85 USD per tpsE	Availability Date March 18, 2021	Total System Cost \$1,104,662 USD
Database Server Configuration			
Operating System Microsoft® Windows Server® 2019 Standard Edition	Database Manager Microsoft SQL Server® 2019 Enterprise Edition	Processors/Cores/Threads 2/128/256	Memory 2048GB
			
			
			
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 SR665, with: <ul style="list-style-type: none"> - 2 x AMD EPYC 7763 64-Core Processor 2.45GHz (2 Procs/128 Cores/256 Threads) - 2048GB 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 Quad 10Gb-T Ethernet - 1 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	



Lenovo ThinkSystem SR665

TPC-E 1.14.0 TPC Pricing 2.7.0

Report Date: Mar 15, 2021
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March 18, 2021

Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware						
ThinkSystem SR665 Configure-To-Order, includes:						
ThinkSystem 2U 2.5" Chassis with 8, 16 or 24 Bays	7D2VCTO1WW	1	95,578	1	95,578	
ThinkSystem AMD EPYC 7763 64C 280W 2.45GHz Processor	B8LZ			1		
ThinkSystem 64GB TruDDR4 Performance- 3200 MHz (2Rx4 1.2V) RDIMM-A	BF73			2		
ThinkSystem RAID 940-16i 8GB Flash PCIe Gen4 12Gb Adapter	BCZZ			32		
ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	B8NZ			1		
ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	B8HU			14		
ThinkSystem 2U 8x2.5" SAS/SATA Backplane	B8JM			2		
ThinkSystem Broadcom 57454 10GBASE-T 4-port OCP Ethernet Adapter	B8LU			2		
ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	B5T4			1		
ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	AUNQ			6		
ThinkSystem 2U PCIe Gen4 x16/x8/x8 Riser 1 or 2	AUKP			1		
ThinkSystem 2U PCIe Gen4 x16/x8/x8 Riser 1 or 2	B8LJ			1		
ThinkSystem 2U PCIe Gen4 x8/x8 PCIe Riser 3	B8LJ			1		
ThinkSystem 1800W (230V) V2 Platinum Hot-Swap Power Supply	B97Z			1		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	B8QB			2		
ThinkSystem XClarity Controller Standard to Enterprise Upgrade	6400			2		
ThinkSystem 2U Performance Fan Option Kit	AUPW			1		
ThinkSystem Toolless Slide Rail Kit v2	B8LY			6		
ThinkSystem 2U EIA Latch Standard (Left)	B8LA			1		
ThinkSystem SR665 2U Refresh MB	B8L7			1		
ThinkSystem 2U EIA Latch with FIO (right)	BF6Z			1		
ThinkSystem 2U MS Air Duct Filler(For 2U Gap)	B8M9			1		
FBU345 SuperCap	B8MP			2		
ThinkSystem 2U MS 3FH Riser1 Cage	AUNP			7		
ThinkSystem 2U MS 3FH Riser2 Cage	B8MN			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR665)	B8M7			1		
	5PS7A78552	1	2,786	1		2,786
					Subtotal	2,786
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	00YJ848	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	7,014
Server Software						
SQL Server 2019 Enterprise Edition (2 Core License)	N/A	2	13,748	64	879,872	
Windows Server 2019 Standard Edition (2 Core License)	N/A	2	123	64	7,872	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
					Subtotal	259
Client Hardware						
ThinkSystem SR650 Configure-To-Order, includes:						
ThinkSystem SR650 2.5" Chassis with 8, 16 or 24 bays	7X06CTO1WW	1	19,575	1	19,575	
Intel Xeon Gold 6248R 24C 205W 3.0GHz Processor	AUVV			1		
ThinkSystem 8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	BAZQ			2		
ThinkSystem 2U/Twr 2.5" SATA/SAS 8-Bay Backplane	B4H1			12		
ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	AURA			1		
ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	AUNJ			1		
ThinkSystem 2U x8/x8/x8 PCIe FH Riser 1	AULY			2		
ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit	AUR4			1		
ThinkSystem 1Gb 2-port RJ45 LOM	AURC			1		
ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	AUKG			1		
Intel X550-T2 Dual Port 10GBase-T Adapter	AUKP			2		
ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply	ATPX			1		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	AVWF			2		
ThinkSystem Toolless Friction Rail	6400			2		
ThinkSystem 2U left EIA Latch Standard	AXFM			1		
ThinkSystem SR650 Refresh MB	AURD			1		
Lenovo ThinkSystem 2U 3FH & 2FH Riser Brackets	B4NL			1		
FBU345 SuperCap	AURQ, AURP			1		
Essential Service - 3Yr 24x7 4Hr Response + YourDrive YourData (SR650)	AUNP			1		
	5PS7A01558	1	2,079	1		2,079
					Subtotal	2,079
Client Software						
Windows Server 2019 Standard Edition (2 Core License)	N/A	2	123	24	2,952	
					Subtotal	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	39	1	39	
ThinkVision T1714p 17 Inch Square LED Backlit LCD Monitor	60FELAR1US	1	159	1	159	
1.0m CAT6 Green Cable	00WE127	1	19	4	76	
Essential Service - 3Yr 24x7 4Hr Response (Rack)	41L2760	1	315	1		315
					Subtotal	315
					Total	12,453
Dollar Volume Discount (See Note 1)		53.87%	1		249,563	
Pricing: 1 - Lenovo 1-877-782-7134; 2 - Microsoft					Three-Year Cost of Ownership USD:	\$1,104,662
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.					TPC-E Throughput:	12,028.02
Benchmark results and test methodology audited by Doug Johnson for InfoSizing, Inc. (www.sizing.com)					\$ USD/tpsE:	\$91.85

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.



Lenovo ThinkSystem SR665

TPC-E 1.14.0 TPC Pricing 2.7.0

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Numerical Quantities Summary

Reported Throughput:
12,028.02 tpsE

Configured Customers:
6,500,000

Response Time (in seconds)	Minimum	Average	90 th Percentile	Maximum
Broker-Volume	0.01	0.02	0.03	0.54
Customer-Position	0.01	0.01	0.02	4.56
Market-Feed	0.01	0.01	0.02	4.56
Market-Watch	0.01	0.01	0.02	0.70
Security-Detail	0.01	0.01	0.01	0.24
Trade-Lookup	0.01	0.04	0.07	0.75
Trade-Order	0.01	0.02	0.04	0.53
Trade-Result	0.01	0.02	0.04	0.72
Trade-Status	0.01	0.01	0.01	0.26
Trade-Update	0.01	0.05	0.07	0.34
Data-Maintenance	0.01	0.01	N/A	0.03

Transaction Mix	Transaction Count	Mix %
Broker-Volume	42,434,530	4.900%
Customer-Position	112,581,234	13.000%
Market-Feed	8,660,186	1.000%
Market-Watch	155,881,205	18.000%
Security-Detail	121,241,225	14.000%
Trade-Lookup	69,280,623	8.000%
Trade-Order	87,467,112	10.100%
Trade-Result	86,601,772	10.000%
Trade-Status	164,542,020	19.000%
Trade-Update	17,320,199	2.000%
Data-Maintenance	120	N/A

Test Duration and Timings

Ramp-up Time (hh:mm:ss)	00:36:38
Measurement Interval (hh:mm:ss)	02:00:00
Business Recovery Time (hh:mm:ss)	00:42:02
Total Number of Transactions Completed in Measurement Interval	866,010,106