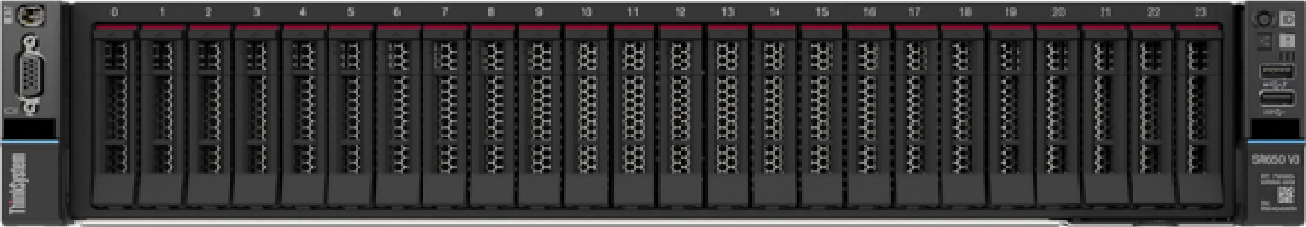
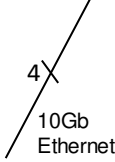
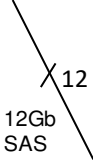


	Lenovo® ThinkSystem™ SR650 V3		TPC-E™ 1.14.0 TPC Pricing 2.8.0
			Report Date: March 13, 2023 Revision Date: March 13, 2023
TPC-E Throughput 12,436.66 tpsE™	Price/Performance \$95.46 USD per tpsE	Availability Date May 18, 2023	Total System Cost \$1,187,202 USD
Database Server Configuration			
Operating System Microsoft® Windows Server® 2022 Standard Edition	Database Manager Microsoft SQL Server® 2022 Enterprise Edition	Processors/Cores/Threads 2/120/240	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 600GB 10K SAS HDD (RAID-1) - 1 x ThinkSystem RAID 940-8i - 1 x Onboard Dual Gb Ethernet - 1 x Intel x550 Dual 10Gb-T Enet - 2 x Broadcom Dual 10Gb-T Enet 		TIER B (Database Server and Storage) 1 x Lenovo ThinkSystem SR650 V3, with: <ul style="list-style-type: none"> - 2 x Intel Xeon Platinum 8490H 60C 1.9GHz Processor (2 Procs/120 Cores/240 Threads) - 2048GB Memory - 2 x 960GB SATA SSD (RAID-1) - 8 x 1600GB SAS SSD (RAID-10) - 1 x ThinkSystem RAID 940-16i - 6 x ThinkSystem RAID 940-8e - 1 x Broadcom Quad 10Gb-T Enet - 1 x Broadcom 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 126x 800GB 2.5" SAS SSD 2x 960GB 2.5" SATA SSD 8x 1600GB 2.5" SAS SSD	



Lenovo ThinkSystem SR650 V3

TPC-E 1.14.0 TPC Pricing 2.8.0

Report Date: March 13, 2023
Revision Date: March 13, 2023

Availability Date:
May 18, 2023

Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware						
ThinkSystem SR650V3 Configure-To-Order, includes:	7D76CTO1WW		221,929	1	221,929	
ThinkSystem V3 2U 24x2.5" Chassis	BLKK			1		
Intel Xeon Platinum 8490H 60C 350W 1.9GHz Processor	BPPS			2		
ThinkSystem 64GB TruDDR5 4800MHz (2Rx4) 10x4 RDIMM	BNF9			32		
ThinkSystem RAID 940-16i 8GB Flash PCIe Gen4 12Gb Adapter	B8NZ			1		
ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	BA7H			2		
ThinkSystem 2.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	BNW9			8		
ThinkSystem 2U 8x2.5" SAS/SATA Backplane	B8LU			2		
ThinkSystem Broadcom 57454 10GBASE-T 4-port OCP Ethernet Adapter	B5T4			1		
ThinkSystem RAID 940-8e 4GB Flash PCIe Gen4 12Gb Adapter	BNWJ			6		
ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	AUKP			1		
ThinkSystem V3 2U x16/x8/x8 PCIe Gen4 Riser1 or 2	BLKL			1		
ThinkSystem V3 2U x16/x8/x8 PCIe Gen4 Riser1 or 2	BLKL			1		
ThinkSystem V3 2U x16/x16 PCIe Gen4 Riser3 Kit with Cage	BPKG			1		
ThinkSystem 1800W 230V Platinum Hot-Swap Gen2 Power Supply	BMUF			2		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	6400			2		
ThinkSystem 2U V3 Performance Fan Module	BLL6			6		
ThinkSystem Toolless Friction Rail v2	BK7W			1		
ThinkSystem 2U V3 EIA Latch Standard	BQQ2			1		
ThinkSystem SR650 V3 MB	BLLO			1		
ThinkSystem 2U Main Air Duct	BP46			1		
ThinkSystem SR650 V3 PSU Duct	BLL3			1		
ThinkSystem RAID 930/940 SuperCap	AUNP			7		
ThinkSystem SR650 V3 Firmware and Root of Trust Security Module	BM8T			1		
ThinkSystem 2U V3 EIA right with FIO	BQQ6			1		
ThinkSystem 2U MS 3FH Riser 1&2 Cage w/Label1	BPKD			1		
ThinkSystem 2U MS 3FH Riser 1&2 Cage	BLLD			1		
ThinkSystem 2U MS Air Duct Filler(For 2U Gap)	B8MP			2		
Lenovo XClarity XCC2 Platinum Upgrade	S91X			1		
Essential Service - 3Yr 24x7 4Hr Resp + YDYD SR650 V3	5PS7B07040	1	1,119	1		1,119
					Subtotal	1,119
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	79	12	948	
Lenovo Storage 800GB 3DWD 2.5" SAS SSD	01DC477	1	2,499	126	314,874	
SFF Drive Blank AMS Filler	01DC624	1	39	18	702	
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	1	49	12	588	
12Gb SAN Rack Mount Kit-Rails 25"-36"	01DC146	1	149	6	894	
Essential Service - 3Yr 24x7 4Hr Resp DS Series Disk Exp	01JR577	1	1,169	6		7,014
					Subtotal	7,014
Server Software						
SQL Server 2022 Enterprise Edition (2 Core License)	N/A	2	15,123	60	907,380	
Windows Server 2022 Standard Edition (16 Core License)	N/A	2	1,069	8	8,552	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
					Subtotal	259
Client Hardware						
ThinkSystem SR650 Configure-To-Order, includes:	7X06CTO1WW	1	32,281	1	32,281	
ThinkSystem SR650 2.5" Chassis with 8, 16 or 24 Bays v2	BMN6			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 940-8i 4GB Flash PCIe Gen4 12Gb Adapter	B8NY			1		
ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD	AULZ			2		
ThinkSystem 2U x8/x8/x8 PCIe FH Riser 1	AUR4			1		
ThinkSystem SR550/SR590/SR650 x16/x8(or 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 v2	BK7W			1		
ThinkSystem 2U left EIA Latch Standard	AURD			1		
ThinkSystem SR650 MLK MB	BPZ0			1		
ThinkSystem RAID 930/940 SuperCap	AUNP			1		
Lenovo ThinkSystem 2U 3FH Riser Bracket	AURQ			1		
Lenovo ThinkSystem 2U 2FH Riser Bracket	AURP			1		
Essential Service - 3Yr 24x7 4Hr Resp + YDYD SR650	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	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776	1	869	1	869	
ThinkSystem Pref. Pro II USB Keyboard - US English	AXTL	1	29	1	29	
ThinkSystem Optical Wheel Mouse - USB	B0LN	1	39	1	39	
ThinkVision S22e-20 21.5inch Monitor	62C6KAR1US	1	149	1	149	
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	10,786
Dollar Volume Discount (See Note 1)	55.58%	1			335,405	

Three-Year Cost of Ownership USD: \$1,187,202
 TPC-E Throughput: 12,436.66
 \$ USD/tpsE: \$95.46

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.



Lenovo ThinkSystem SR650 V3

TPC-E 1.14.0 TPC Pricing 2.8.0

Report Date: March 13, 2023
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Numerical Quantities Summary

Reported Throughput:
12,436.66 tpsE

Configured Customers:
6,500,000

Response Time (in seconds)	Minimum	Average	90 th Percentile	Maximum
Broker-Volume	0.01	0.01	0.02	1.00
Customer-Position	0.01	0.01	0.02	2.07
Market-Feed	0.01	0.01	0.02	2.36
Market-Watch	0.01	0.01	0.02	0.87
Security-Detail	0.01	0.01	0.01	0.28
Trade-Lookup	0.01	0.04	0.06	0.67
Trade-Order	0.01	0.03	0.07	2.61
Trade-Result	0.01	0.02	0.04	5.13
Trade-Status	0.01	0.01	0.01	3.51
Trade-Update	0.01	0.05	0.07	0.61
Data-Maintenance	0.01	0.03	N/A	0.30

Transaction Mix	Transaction Count	Mix %
Broker-Volume	43,868,642	4.900%
Customer-Position	116,386,027	13.000%
Market-Feed	8,954,413	1.000%
Market-Watch	161,150,212	18.000%
Security-Detail	125,338,810	14.000%
Trade-Lookup	71,621,904	8.000%
Trade-Order	90,422,926	10.100%
Trade-Result	89,543,953	10.002%
Trade-Status	170,103,007	19.000%
Trade-Update	17,905,507	2.000%
Data-Maintenance	120	N/A

Test Duration and Timings

Ramp-up Time (hh:mm:ss)	00:36:51
Measurement Interval (hh:mm:ss)	02:00:00
Business Recovery Time (hh:mm:ss)	00:32:32
Total Number of Transactions Completed in Measurement Interval	895,295,401