
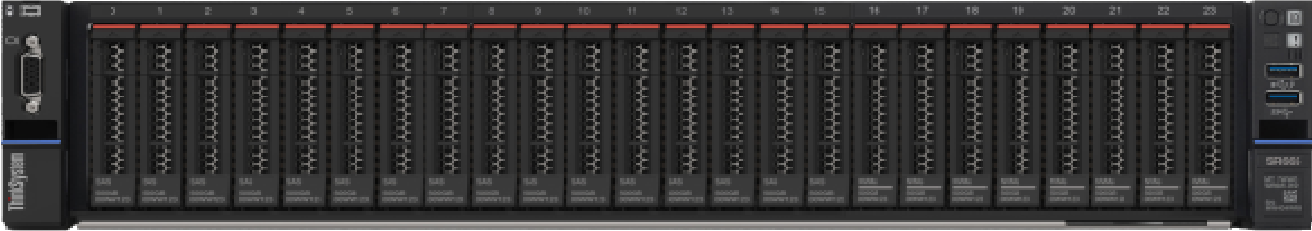
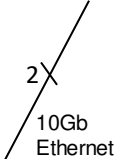





| | | | |
|---|--|---|--|
|  | Lenovo® ThinkSystem™ SR665 | | TPC-E™ 1.14.0 TPC Pricing 2.7.0 |
| | | | Report Date: August 17, 2021 Revision Date: August 17, 2021 |
| TPC-E Throughput 2,579.00 tpsE™ | Price/Performance \$68.62 USD per tpsE | Availability Date August 17, 2021 | Total System Cost \$176,954 USD |
| Database Server Configuration | | | |
| Operating System Microsoft® Windows Server® 2019 Standard Edition | Database Manager Microsoft SQL Server® 2019 Enterprise Edition | Processors/Cores/Threads 2/16/32 | Memory 1024GB |
|  | | | |
|  | |  | |
|  | |  | |
| TIER A (Client) | | TIER B (Database Server and Storage) | |
| 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 | | 1 x Lenovo ThinkSystem SR665, with: <ul style="list-style-type: none"> - 2 x AMD EPYC 72F3 8-Core Processor 3.7GHz (2 Procs/16 Cores/32 Threads) - 1024GB Memory - 2 x 480GB SATA SSD (RAID-1) - 4 x 800GB SAS SSD (RAID-10) - 3 x 1200GB 10K SAS HDD (RAID-5) - 1 x ThinkSystem RAID 940-16i - 1 x ThinkSystem RAID 930-8e - 1 x Onboard Quad 10Gb-T Ethernet - 1 x Broadcom NX-E Dual 10Gb-T Enet | |
| | | 1 x Lenovo Storage D1224 DAS Enclosure, with: <ul style="list-style-type: none"> - 21 x 800GB 2.5" SAS SSD (1 x 21-drive RAID-5) | |
| | | 21 Total External Drives | |
| Initial Database Size 11,479 GB | Redundancy Level: 1 RAID-10 Log, tempdb RAID-5 Data | Storage 25x 800GB 2.5" SAS SSD 2x 480GB 2.5" SAS SSD 3x 1200GB 2.5" 10K SAS HDD | |



Lenovo ThinkSystem SR665

TPC-E 1.14.0 TPC Pricing 2.7.0

Report Date: August 17, 2021
Revision Date: August 17, 2021

Availability Date:
August 17, 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 | 7D2VCT01WW | 1 | 40,248 | 1 | 40,248 | |
| ThinkSystem AMD EPYC 72F3 8C 180W 3.7GHz Processor | B8LZ | | | 1 | | |
| ThinkSystem 64GB TruDDR4 Performance+ 3200 MHz (2Rx4 1.2V) RDIMM-A | BF7H | | | 2 | | |
| ThinkSystem RAID 940-16i 8GB Flash PCIe Gen4 12Gb Adapter | BCZZ | | | 16 | | |
| 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 | | | 4 | | |
| ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD | B8JM | | | 2 | | |
| ThinkSystem 2U 8x2.5" SAS/SATA Backplane | AUM1 | | | 3 | | |
| 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 | | | 1 | | |
| 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 1100W (230V/115V) V2 Platinum Hot-Swap Power Supply | B8LJ | | | 1 | | |
| 2.8m, 13A/100-250V, C13 to C14 Jumper Cord | B8QC | | | 2 | | |
| ThinkSystem XClarity Controller Standard to Enterprise Upgrade | 6400 | | | 2 | | |
| ThinkSystem SR665 Performance Fan Option Kit | AUPW | | | 1 | | |
| ThinkSystem Toolless Slide Rail Kit v2 | B8LY | | | 6 | | |
| ThinkSystem 2U EIA Latch Standard (Left) | B8LA | | | 1 | | |
| ThinkSystem SR665 MB for 7003, TPM 2.0 | B8L7 | | | 1 | | |
| ThinkSystem 2U EIA Latch with FIO (right) | BF6Z | | | 1 | | |
| FBU345 SuperCap | B8M9 | | | 1 | | |
| MS 2FH Riser Filler | AUNP | | | 2 | | |
| ThinkSystem 2U MS 3FH Riser2 Cage | BC4X | | | 1 | | |
| ThinkSystem 2U MS 3FH Riser1 Cage | B8M7 | | | 1 | | |
| Essential Service - 3Yr 24x7 4Hr Resp + YDYD SR665 | B8MN | | | 1 | | |
| | 5PS7A78360 | 1 | 2,079 | 1 | | 2,079 |
| | | | | | Subtotal | 2,079 |
| Server Storage | | | | | | |
| Lenovo Storage D1224 SFF Chassis, Dual ESM | 4587A31 | 1 | 2,999 | 1 | 2,999 | |
| External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable | 00YJ848 | 1 | 59 | 2 | 118 | |
| Lenovo Storage 800GB 3DWD 2.5" SAS SSD | 01DC477 | 1 | 2,499 | 21 | 52,479 | |
| Essential Service - 3Yr 24x7 4Hr Response (D1224) | 01JR577 | 1 | 1,169 | 1 | | 1,169 |
| | | | | | Subtotal | 1,169 |
| Server Software | | | | | | |
| SQL Server 2019 Enterprise Edition (2 Core License) | N/A | 2 | 13,748 | 8 | 109,984 | |
| Windows Server 2019 Standard Edition (2 Core License) | N/A | 2 | 123 | 8 | 984 | |
| 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 | 7X06CT01WW | 1 | 19,579 | 1 | 19,579 | |
| 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 | 19 | 1 | 19 | |
| ThinkVision LT1913p 19 Inch Square In-Plane Switching LED Backlit LCD Monitor | 60FBHAR1US | 1 | 279 | 1 | 279 | |
| 1.0m CAT6 Green Cable | 00WE127 | 1 | 19 | 2 | 38 | |
| Essential Service - 3Yr 24x7 4Hr Response (Rack) | 41L2760 | 1 | 315 | 1 | | 315 |
| | | | | | Subtotal | 315 |
| | | | | | Total | 5,901 |
| Dollar Volume Discount (See Note 1) | | 49.16% | 1 | | 60,699 | |

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)

| | |
|--|-----------|
| Three-Year Cost of Ownership USD: | \$176,954 |
| TPC-E Throughput: | 2,579.00 |
| \$ USD/tpsE: | \$68.62 |

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

Report Date: August 17, 2021
Revision Date: August 17, 2021

Availability Date:
August 17, 2021

Numerical Quantities Summary

Reported Throughput:
2,579.00 tpsE

Configured Customers:
1,400,000

| Response Time (in seconds) | Minimum | Average | 90 th Percentile | Maximum |
|----------------------------|---------|---------|-----------------------------|---------|
| Broker-Volume | 0.01 | 0.01 | 0.02 | 0.05 |
| Customer-Position | 0.01 | 0.01 | 0.02 | 0.07 |
| Market-Feed | 0.01 | 0.01 | 0.02 | 0.09 |
| Market-Watch | 0.01 | 0.01 | 0.01 | 0.09 |
| Security-Detail | 0.01 | 0.01 | 0.01 | 0.06 |
| Trade-Lookup | 0.01 | 0.03 | 0.05 | 0.16 |
| Trade-Order | 0.01 | 0.02 | 0.03 | 0.11 |
| Trade-Result | 0.01 | 0.02 | 0.04 | 0.11 |
| Trade-Status | 0.01 | 0.01 | 0.01 | 0.09 |
| Trade-Update | 0.01 | 0.04 | 0.05 | 0.12 |
| Data-Maintenance | 0.01 | 0.01 | N/A | 0.02 |

| Transaction Mix | Transaction Count | Mix % |
|-------------------|-------------------|---------|
| Broker-Volume | 9,099,753 | 4.900% |
| Customer-Position | 24,142,322 | 13.000% |
| Market-Feed | 1,856,887 | 1.000% |
| Market-Watch | 33,427,944 | 18.000% |
| Security-Detail | 25,999,456 | 14.000% |
| Trade-Lookup | 14,856,847 | 8.000% |
| Trade-Order | 18,756,695 | 10.100% |
| Trade-Result | 18,568,844 | 9.999% |
| Trade-Status | 35,284,790 | 19.000% |
| Trade-Update | 3,714,176 | 2.000% |
| Data-Maintenance | 120 | N/A |

Test Duration and Timings

| | |
|--|-------------|
| Ramp-up Time (hh:mm:ss) | 00:28:59 |
| Measurement Interval (hh:mm:ss) | 02:00:00 |
| Business Recovery Time (hh:mm:ss) | 00:19:08 |
| Total Number of Transactions Completed in Measurement Interval | 185,707,714 |