Data Storage Systems Specification

Lenovo ThinkSystem Powered by RAIDIX 4.7.0-L
672 drives / 8 JBODs

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Storage server: **Lenovo ThinkSystem SR650**
Disk platform: **Lenovo Storage D3284**
Storage Software: **RAIDIX 4.7.0-L**

Component	Specification
Form factor	Server: 2x 2U rack mount Expansion Enclosure: 5U rack mount
Controller configuration	Dual controller (known as *node canister*) configuration
CPU Model	4x CPU Intel Xeon Gold 6126 (2 CPU per node canister)
RAID levels	RAID 0, 1, 5, 6, 7.3, N+M and 10
Controller cache	512 GB per system (256 GB per node canister). Cache is synchronized between the node canisters.
Drive bays	Up to 672 drive bays per storage system: 84 NL-SAS drive bays in the expansion enclosure; up to 8 expansion enclosures
Drive technology	SAS or NL SAS HDDs; SAS SSDs (only for L2 cache)
Drive connectivity*	Connect through an external storage: 12 Gb SAS. Controller unit with two node canisters: 16x 12 Gb SAS expansion ports for the attachment of the expansion enclosures (8 ports per node canister)
Drives	Drive options for storage: hot-swap drives (Lenovo Storage D3284 External High Density Drive Expansion Enclosure. Product Guide. Table 7)
Storage capacity	Up to 9.408TB (672x 14TB)
Synchronization connectivity**	4x 100Gb IB sync port (2 ports per node canister)
Host connectivity***	Standard ports (with two node canisters): • 4/8x 1 Gb iSCSI host ports (RJ-45) (2/4 ports per node canister) • 4/8x 1 Gb iSCSI host ports (RJ-45) (2/4 ports per node canister) • 4/8x 10Gb iSCSI host ports SFP+ (2/4 ports per node canister) • 4x 16 Gb FC SFP+ host ports (2 ports per node canister) Optional additional ports on host interface cards (with two node canisters): • 16x 10Gb iSCSI SFP+ host port (8 ports per node canister) • 8x 25/40/56 Gb iSCSI SFP28 host ports (4 ports per node canister) • 8x 56 Gb IB QSFP+ host ports (4 ports per node canister) • 8x 100 Gb iSCSI/IB QSFP28/QSFP+ host ports (4 ports per node canister) • 8x 16 Gb FC SFP+ host ports (4 ports per node canister) • 16x 12Gb SAS host ports (8 ports per node canister)

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Component	Specification
Host operating systems	Microsoft Windows Server 2008R2, 2012, 2012R2, and 2016; Red Hat Enterprise Linux (RHEL) 6 and 7; VMware vSphere 5.1, 5.5, 6.0, and 6.5.
Standard software features	Advanced reconstruction, Partial reconstruction, Silent Data Corruption detection and protection, RAID N+M, iSCSI, NAS, Automatic Write Through
Optional software features	FC, IB, SAS, SSD cache, QoSmic, SAN Optimizer
Cooling	Redundant cooling with the fan modules that are built into power supplies. Up to six hot-swap system fans that provide N+1 cooling redundancy (per node canister).
Power supply	Two redundant hot-swap up to 1600W AC power supplies (per node canister).
Hot-swap parts	Expansion enclosure, SFP/SFP+ transceivers, drives, power supplies with fans.
Management interfaces	2x 1 GbE ports (UTP, RJ-45) in a primary/redundant configuration (per node canister). Web-based GUI; SSH CLI; SMI-S; SNMP and email notifications.
Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, LDAP authentication
Warranty	Three-year customer-replaceable unit and onsite warranty with 9x5 next business day terms. Optional warranty service upgrades are available through Lenovo: 24x7 coverage, 2-hour or 4-hour response time, 6-hour or 24-hour committed repair, 1-year or 2-year warranty extensions, YourDrive YourData.
Dimensions	Control enclosure one canister height: 87 mm (3.4 in.); width: 445 mm (17.5 in.); depth: 720 mm (28.3 in.) Expansion enclosure height: 221 mm (8.7 in.); width: 447 mm (17.6 in.); depth: 933 mm (36.7 in.)
Weight	Control enclosure (fully configured): 26 kg (57.3 lb) Expansion enclosure (fully configured): 131 kg (288.8 lb)

* HBA for enclosure connectivity:

Description	Part number	Feature code	Maximum supported	I/O slots supported
12 Gbps SAS HBAs				
ThinkSystem 430-16e SAS/SATA 12Gb HBA	7Y37A01091	AUNN	4 / 5	1, 2, 3, 4, 5

** HBA for cache synchronization:

Description	Part number	Feature code	Maximum supported	I/O slots supported
PCIe x16 Low Profile adapters - 100 Gb Ethernet / EDR InfiniBand				
Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	00MM960	ATRP	1 / 3	1, 5, 6

*** HBAs for host connectivity:

Description	Part number	Feature code	Max qty#	I/O slots supported
12 Gb SAS HBA				
ThinkSystem 430-8e SAS/SATA 12Gb HBA	7Y37A01090	AUNR	4 / 5	1, 2, 3, 4, 5
ThinkSystem 430-16e SAS/SATA 12Gb HBA	7Y37A01091	AUNN	4 / 5	1, 2, 3, 4, 5
16 Gb Fibre Channel HBA				
QLogic 16Gb Enhanced Gen5 FC Single-port HBA	01CV750	ATZB	4 / 6	1, 2, 3, 4, 5, 6
QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	01CV760	ATZC	4 / 6	1, 2, 3, 4, 5, 6
LOM cards - 1 Gb Ethernet				
ThinkSystem 1Gb 2-port RJ45 LOM	7ZT7A00544	AUKG	1	LOM slot
ThinkSystem 1Gb 4-port RJ45 LOM	7ZT7A00545	AUKH	1	LOM slot
LOM cards - 10 Gb Ethernet				
ThinkSystem 10Gb 2-port Base-T LOM	7ZT7A00548	AUKL	1	LOM slot
ThinkSystem 10Gb 2-port SFP+ LOM	7ZT7A00546	AUKJ	1	LOM slot
ThinkSystem 10Gb 4-port Base-T LOM	7ZT7A00549	AUKM	1	LOM slot
ThinkSystem 10Gb 4-port SFP+ LOM	7ZT7A00547	AUKK	1	LOM slot
ML2 adapters - 10 Gb Ethernet				
Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter	7ZT7A00497	AUKQ	1	3 (ML2)
Intel X710-DA2 ML2 2x10GbE SFP+ Adapter	00JY940	ATRH	1	3 (ML2)
ML2 adapters - 25 Gb Ethernet				
Mellanox ConnectX-4 Lx ML2 1x25GbE SFP28 Adapter	00MN990	ATZR	1	3 (ML2)
Mellanox ConnectX-4 Lx ML2 25Gb 2-Port SFP28 Ethernet Adapter	7ZT7A00507	AUKU	1	3 (ML2)
ML2 adapters - FDR InfiniBand				
Mellanox ConnectX-3 Pro ML2 FDR 2-Port QSFP VPI Adapter	7ZT7A00501	AUKR	1	3 (ML2)
PCIe Low Profile adapters - 1 Gb Ethernet				
ThinkSystem I350-F1 PCIe 1Gb 1-Port SFP Ethernet Adapter	7ZT7A00533	AUZZ	4 / 6	1, 2, 3, 4, 5, 6
ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter	7ZT7A00534	AUZY	4 / 6	1, 2, 3, 4, 5, 6
ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	7ZT7A00535	AUZW	4 / 6	1, 2, 3, 4, 5, 6
PCIe Low Profile adapters - 10 Gb Ethernet				
Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter	7ZT7A00496	AUKP	4 / 6	1, 2, 3, 4, 5, 6

Intel X550-T2 Dual Port 10GBase-T Adapter	00MM860	ATPX	4 / 6	1, 2, 3, 4, 5, 6
Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	7ZT7A00537	AUKX	4 / 6	1, 2, 3, 4, 5, 6
PCIe Full Height adapters - 10 Gb Ethernet				
Emulex OCe14104B-NX PCIe 10Gb 4-Port SFP+ Ethernet Adapter	7ZT7A00493	AUKN	3 / 5	1, 2, 3, 5, 6
PCIe Low Profile adapters - 25 Gb Ethernet				
Broadcom NX-E PCIe 25Gb 1-Port SFP28 Ethernet Adapter	7ZT7A00505	AUKS	4 / 6	1, 2, 3, 4, 5, 6
Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter	7XC7A05523	B0WY	4 / 6	1, 2, 3, 4, 5, 6
Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter	01GR250	AUAJ	4 / 6	1, 2, 3, 4, 5, 6
PCIe Low Profile adapters - 40 Gb Ethernet				
Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	00MM950	ATRN	4 / 6	1, 2, 3, 4, 5, 6
PCIe Low Profile adapters - FDR InfiniBand				
Mellanox ConnectX-4 PCIe FDR 1-Port QSFP VPI Adapter	7XC7A05524	B0WX	4 / 6	1, 2, 3, 4, 5, 6
Mellanox ConnectX-4 PCIe FDR 2-Port QSFP VPI Adapter	7ZT7A00500	AUVG	4 / 6	1, 2, 3, 4, 5, 6
PCIe x16 Low Profile adapters - 100 Gb Ethernet / EDR InfiniBand				
Mellanox ConnectX-4 1x100GbE/EDR IB QSFP28 VPI Adapter	00KH924	ASWQ	1 / 3	1, 5, 6
Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	00MM960	ATRP	1 / 3	1, 5, 6

Why Lenovo

Lenovo is a leading provider of systems for the data center. The portfolio includes rack, tower, blade, dense, and hyperconverged systems, and provides enterprise class performance, reliability, and security. Lenovo also offers a full range of networking, storage, software, and solutions, as well as comprehensive services that support business needs throughout the IT life cycle.

About RAIDIX

RAIDIX is a software developing company specializing in storage solutions for data intensive workloads. Technology innovations including proprietary RAID engine and unique algorithms of parallel calculations create core value of company's products that root in deep mathematical research and scientific intelligence of in-house lab. RAIDIX data storage solutions are tailored for needs of Media & Entertainment, Video Surveillance, HPC, Technical Computing and other data-rich industries.

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