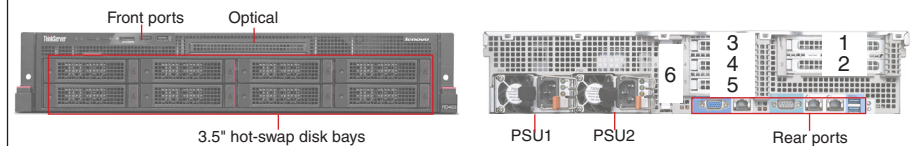


ThinkServer RD450 with 3.5" Disk Drive Bay Platform Specifications

Product Specifications Reference (PSREF)

| Components | Specification |
|-----------------------------|--|
| Form factor | 2U rack |
| Processor | Up to two 105W Intel Xeon E5-2600 v3 family processors with 12 cores up to 1.8 GHz, 10 cores up to 2.6 GHz, 8 cores up to 2.6 GHz, 6 cores up to 2.4 GHz, 4 cores up to 3 GHz. Two QPI link up to 9.6 GT/s. Up to 2133MHz memory speed. Up to 30MB cache |
| Memory DIMMs | 16 DIMM sockets. 4 channels per processor, 2 DIMMs per channel. |
| Memory capacity | 256GB (RDIMM, 16GB x 16)/512GB (LRDIMM, 32GB x 16), 2nd CPU is needed |
| Memory protection | ECC, memory mirroring, lockstep, and memory sparing |
| RAID support | RAID 0, 1, 10 with embedded RAID 110i , 6Gb/s SATA, optional key for RAID5. RAID 0, 1, 10 with RAID 500 , PCIe adapter, 6Gb/s SAS/SATA, optional key for RAID5/50. RAID 0, 1, 10, 5, 50, 6, 60 with RAID 710 , PCIe adapter, 6Gb/s SAS/SATA, 1GB memory, optional CacheVault flash cache with super capacitor, CacheCade Pro, or FastPath upgrade key |
| Disk drive bays | Up to 8 x 3.5" disk drive bays |
| SD module | Optional SD module, supports up to 2 optional SDHC flash cards |
| Internal storage | 3.5" SATA (7.2K 6Gbs HDD) 1TB/2TB/3TB/4TB/ |
| | 3.5" SAS (7.2K 6Gbs HDD) 1TB/2TB/3TB/4TB/ |
| | 2.5" SAS SSD (12Gbs) 200GB/400GB/800GB |
| | 2.5" SATA SSD (6Gbs) 120GB/240GB/300GB/480GB/600GB/800GB |
| | PCIe SSD Adapter 1.6TB/3.2TB |
| | SDHC flash card 8GB/32GB |
| | <i>Note: 1. SAS drive needs SAS adapter. 2. SDHC flash card needs SDHC flash memory module. 3. On 3.5" models, 2.5" drive comes with a 3.5" carrier.</i> |
| Optical drive | Optional one UltraSlim optical drive bay, supports DVD-ROM or DVD±RW |
| Tape drive bays | No internal tape bay |
| Network interfaces | One dedicated management port, two Gigabit Ethernet ports. Supports optional discrete network adapters via PCIe slots |
| Security features | Power-on and administrator password. Optional Trusted Platform Module (TCG 1.2-compliant). Optional chassis intrusion switch |
| Systems management | Supports ThinkServer System Manager (TSM), optional TSM Premium. UEFI. Onboard Aspeed AST2400 graphics/management processor, IPMI 2.0-compliant baseboard management controller (BMC). Control Panel LEDs shows the status of power, ID, network, system. Supports ThinkServer management software: Diagnostics, Deployment Manager, Energy Manager, System Manager, Partner Pack for VMware vCenter and Microsoft System Center Operations Manager, Power Planner |
| Power supply | Up to two redundant hot-swap 450 W ac or 550 W ac or 750 W ac or 1100 W ac power supplies. 550 W and 1100 W are 80 PLUS Platinum qualified, 750 W is 80 PLUS Platinum or Titanium qualified, 450 W is 80 PLUS Gold qualified. 750 W Titanium is 200V - 240V, others are 110V - 240V |
| Operating systems supported | Microsoft Windows Server 2012 R2/2012/2008 R2. Windows Small Business Server 2011. Red Hat Enterprise Linux 6.5/6.6/7. SUSE Linux Enterprise Server 11. VMware vSphere (ESXi) 5.1 P5/5.5 U2/6.0 |
| Rack kit | Optional slide or static rack kit on selected model |
| Base warranty | 1 or 3-year limited onsite service with 9x5/NBD. Some parts are Customer Replaceable Units |

| Components | Specification | |
|-----------------------------|--|--------------------------------------|
| Graphics | Onboard Aspeed AST2400 with 16MB memory, one DisplayPort on front, one VGA on rear. Maximum resolution: 1920x1200@60Hz | |
| Front ports | Two USB 2.0, one DisplayPort | |
| Rear ports | One VGA, two USB 3.0, one RJ-45 (dedicated mgmt), two ethernet, one serial (9-pin) | |
| Cooling | 4 (3+1, dual processors) or 3 (2+1, single processor) fans, non-hot swap | |
| Hot-swap parts | Disk drives, power supplies | |
| Noise emissions | Operating: < 6.5 Bels, Idle: < 5.6 Bels (Maximum configuration) | |
| Environmental specification | Temperature - operating | 50 °F to 95 °F (10 °C to 35 °C) |
| | Temperature - non operating (no package) | -10 °C to 60 °C |
| | Temperature - non operating (with package) | -40 °C to 70 °C |
| | Altitude - operating | (Unpressurized): 0-10000ft (0-3048m) |
| | Humidity - operating | 8%-90%, non-condensing |
| | Humidity - storage (with package) | 8%-90%, non-condensing |
| Weight | Minimum configuration: 16 kg (35.3 lb), maximum: 27 kg (59.52 lb) | |
| Dimensions | Height: 87 mm (3.4 in), width: 482 mm (19 in), depth: 764 mm (30 in) | |



Expansion slots

Up to 6 PCIe 3.0 slots: one vertical onboard PCIe slot, up to 5 PCIe slots via two optional riser cards.

- Slot 1 (riser card 1): PCIe 3.0 x8, half length, full height, CPU1
- Slot 2 (riser card 1): PCIe 3.0 x8, half length, full height, CPU1
- Slot 3 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU2, requires 2nd riser card and 2nd CPU
- Slot 4 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU2, requires 2nd riser card and 2nd CPU
- Slot 5 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU1, requires 2nd riser card and 2nd CPU
- Slot 6 (onboard): PCIe 3.0 x16 (x8 elec), low-profile, half length, requires 2nd CPU

Note: Although slot 5 connects to CPU1, slot 5 is supported on model with two processors and two riser cards only.

Core options for ThinkServer RD450 (partial)

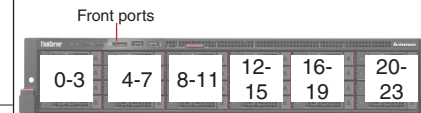
- 4X70F28590 16GB DDR4-2133MHz (2Rx4) RDIMM
- 4X70F28591 32GB DDR4-2133MHz (4Rx4) LRDIMM
- 4XB0G45719 3.5" 4TB 7.2K Enterprise SAS 6Gbps Hot Swap Hard Drive
- 4XB0G45735 3.5" 800GB Enterprise Performance SAS 12Gbps Hot Swap Solid State Drive
- 4XB0G45747 3.5" 800GB Value Read-Optimized SATA 6Gbps Hot Swap Solid State Drive
- 4XB0F28662 3.2TB ioMemory SX300 Performance PCIe 2.0 SSD by FusionIO
- 4XF0G45865 SDHC Flash Assembly Module
- 4X70F28593 32GB SD Card
- 4XB0G45760 RD350,RD450 RAID 710 PCIe Adapter
- 4XF0G45867 ThinkServer System Manager Premium
- 4X20F28576 750W Titanium Hot Swap Power Supply
- 4X90F92980 DisplayPort to VGA Dongle

ThinkServer RD450 with 2.5" Disk Drive Bay Platform Specifications

Product Specifications Reference (PSREF)

| Components | Specification |
|--------------------|--|
| Form factor | 2U rack |
| Processor | Up to two 105W Intel Xeon E5-2600 v3 family processors with 12 cores up to 1.8 GHz, 10 cores up to 2.6 GHz, 8 cores up to 2.6 GHz, 6 cores up to 2.4 GHz, 4 cores up to 3 GHz. Two QPI link up to 9.6 GT/s. Up to 2133MHz memory speed. Up to 30MB cache |
| Memory DIMMs | 16 DIMM sockets. 4 channels per processor, 2 DIMMs per channel. RDIMM or LRDIMM (cannot be intermixed), DDR4, 2133MHz |
| Memory capacity | 256GB (RDIMM, 16GB x 16)/512GB (LRDIMM, 32GB x 16), 2nd CPU is needed |
| Memory protection | ECC, memory mirroring, lockstep, and memory sparing |
| AnyRAID support | Supports AnyRAID 110i/510i/720i/720ix for 8 x 2.5" model, 720ix for 16 or 24x 2.5" model. RAID 0, 1, 10 with AnyRAID 110i. 6Gb/s SATA, optional key for RAID 5. RAID 0, 1, 10 with AnyRAID 510i. 6Gb/s SAS/SATA, optional key for RAID 5/50. RAID 0, 1, 10, 5, 50, 6, 60 with AnyRAID 720i/720ix. 12Gb/s SAS/SATA. 720i needs cache for RAID 6/60 support. 720ix must have a cache. Optional cache for 720i/720ix: 1GB read-only memory. 1GB/2GB/4GB flash with super capacitor. Flash options include CacheVault, CacheCade Pro, and FastPath |
| Disk drive bays | Up to 8 x 2.5" (Bay 0-7) disk drive bays, or up to 16 x 2.5" (Bay 0-15) disk drive bays, or up to 24 x 2.5" (Bay 0-23) disk drive bays (see right) |
| SD module | Optional SD module, supports up to 2 optional SDHC flash cards |
| Internal storage | 2.5" SATA (7.2K 6Gbs HDD) 500GB/1TB |
| | 2.5" SAS (10K 6Gbs HDD) 300GB/600GB/900GB/1.2TB |
| | 2.5" SAS (15K 6Gbs HDD) 146GB/300GB/450GB/600GB |
| | 2.5" SAS SSD (12Gbs) 200GB/400GB/800GB |
| | 2.5" SATA SSD (6Gbs) 120GB/240GB/300GB/480GB/600GB/800GB |
| | Tape drive 2.5TB |
| | PCIe SSD Adapter 1.6TB/3.2TB |
| | SDHC flash card 8GB/32GB |
| | <i>Note: 1. SAS drive needs SAS adapter. 2. SDHC flash card needs SDHC flash memory module.</i> |
| Optical drive | Optional one UltraSlim optical drive bay on 8 and 16 x 2.5" bays model, supports DVD-ROM or DVD±RW |
| Tape drive bays | Supports up to one LTO-6 internal SAS tape drive. 8 x 2.5" model only. AnyRAID 720ix is needed |
| Network interfaces | One dedicated management port, two Gigabit Ethernet ports. Supports optional discrete network adapters via PCIe slots |
| Security features | Power-on and administrator password. Optional Trusted Platform Module (TCG 1.2-compliant). Optional chassis intrusion switch |
| Systems management | Supports ThinkServer System Manager (TSM), optional TSM Premium. UEFI. Onboard Aspeed AST2400 graphics/management processor, IPMI 2.0-compliant baseboard management controller (BMC). Control Panel LEDs shows the status of power, ID, network, system. Supports ThinkServer management software: Diagnostics, Deployment Manager, Energy Manager, System Manager, Partner Pack for VMware vCenter and Microsoft System Center Operations Manager, Power Planner |
| Power supply | Up to two redundant hot-swap 450 W ac or 550 W ac or 750 W ac or 1100 W ac power supplies. 550 W and 1100 W are 80 PLUS Platinum qualified, 750 W is 80 PLUS Platinum or Titanium qualified, 450 W is 80 PLUS Gold qualified. 750 W Titanium is 200V - 240V, others are 110V - 240V. 450 W is supported on 8 x 2.5" models only |

| Components | Specification | |
|-----------------------------|--|--------------------------------------|
| Operating systems supported | Microsoft Windows Server 2012 R2, 2012, and 2008 R2, Windows Small Business Server 2011, Windows Server Storage 2012 R2 and 2012, Windows Multipoint Server 2012, Red Hat Enterprise Linux 7.0 and 6.5. SUSE Linux Enterprise Server 11 SP3. VMware vSphere (ESXi) 5.1 P5 and 5.5 U2 | |
| Rack kit | Optional slide or static rack kit on selected model | |
| Base warranty | 1 or 3-year limited onsite service with 9x5/NBD. Some parts are Customer Replaceable Units | |
| Graphics | Onboard Aspeed AST2400 with 16MB memory, one DisplayPort on front, one VGA on rear. Maximum resolution: 1920x1200@60Hz | |
| Front ports | Two USB 2.0, one DisplayPort | |
| Rear ports | One VGA, two USB 3.0, one RJ-45 (dedicated mgmt), two ethernet, one serial (9-pin) | |
| Cooling | 4 (3+1, dual processors) or 3 (2+1, single processor) fans, non-hot swap | |
| Hot-swap parts | Disk drives, power supplies | |
| Noise emissions | Operating: < 6.5 Bels, Idle: < 5.6 Bels (Maximum configuration) | |
| Environmental specification | Temperature - operating | 50 °F to 95 °F (10 °C to 35 °C) |
| | Temperature - non operating (no package) | -10 °C to 60 °C |
| | Temperature - non operating (with package) | -40 °C to 70 °C |
| | Altitude - operating | (Unpressurized): 0-10000ft (0-3048m) |
| | Humidity - operating | 8%~90%, non-condensing |
| | Humidity - storage (with package) | 8%~90%, non-condensing |
| Weight | Minimum configuration: 16 kg (35.3 lb), maximum: 27 kg (59.52 lb) | |
| Dimensions | Height: 87 mm (3.4 in), width: 482 mm (19 in), depth: 764 mm (30 in) | |



Tape drive and optical are located in bay 16-23



PSU1 PSU2 Rear ports

Expansion slots

Up to 6 PCIe 3.0 slots: one vertical onboard PCIe slot, up to 5 PCIe slots via two optional riser cards.

- Slot 1 (riser card 1): PCIe 3.0 x8, half length, full height, CPU1
- Slot 2 (riser card 1): PCIe 3.0 x8, half length, full height, CPU1
- Slot 3 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU2, requires 2nd riser card and 2nd CPU
- Slot 4 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU2, requires 2nd riser card and 2nd CPU
- Slot 5 (riser card 2): PCIe 3.0 x8, low-profile, half length, CPU1, requires 2nd riser card and 2nd CPU
- Slot 6 (onboard): PCIe 3.0 x16 (x8 elec), low-profile, half length, requires 2nd CPU

Note: Although slot 5 connects to CPU1, slot 5 is supported on model with two processors and two riser cards only.

Core options for ThinkServer RD450 (partial)

- 4X70F28590 16GB DDR4-2133MHz (2Rx4) RDIMM
- 4XB0F28662 3.2TB ioMemory SX300 Performance PCIe 2.0 SSD by FusionIO
- 4XF0G45866 LTO-6 Linear Tape Drive Kit by Tandberg
- 4XB0G45757 Lenovo ThinkServer RD450 Raid 720ix AnyRAID Adapter with Expander
- 4XF0G45867 ThinkServer System Manager Premium
- 4X20F28576 750W Titanium Hot Swap Power Supply
- 4X90F92980 DisplayPort to VGA Dongle