Smarter technology for all

Servicing the ThinkSystem ST50 V3

ES72643

April 2025

Prerequisites

- ES42373B – Intel Xeon processor architecture for ThinkSystem V3 servers
- ES51757B – Introducing ThinkSystem tools
- ES52374 – ThinkSystem tools for the ThinkSystem V3 platform
- ES41759C – ThinkSystem problem determination
- ES51780C – Servicing the ThinkSystem storage controllers
- ES42190 – Servicing the ThinkSystem 4350/5350/9350 RAID/HBA series adapters

Objectives

After completing the course, you will be able to:

- Describe the ThinkSystem ST50 V3 features and specifications
- Describe the ST50 V3 configurations
- Describe the ST50 V3 management tools
- Describe the problem determination steps and explain how to troubleshoot issues with the ST50 V3

What’s new

ThinkSystem ST50 V3 — April 2025 updates

What's new in the April 2025 updates

The following hardware configurations have been added in this release:

- Supported processors
- Supported memory

Note: For the latest list of supported processors, memory, and operating systems, refer to the product guide on Lenovo Press.

Product overview

Product description and front, rear, and inside views

ThinkSystem ST50 V3 overview

The ThinkSystem ST50 V3 is a one-socket 4U tower server featuring an Intel Xeon-E or Pentium processor with up to eight cores and a TDP of 95 W.

ThinkSystem ST50 V3 machine types:

- 7DF3 (three-year warranty)
- 7DF4 (one-year warranty)

Lenovo

Features and specifications

Feature	Specification
Form factor	• 1S entry tower (17L) • Dimensions (H*W*D): 376 mm x 170 mm x 316 mm (with stand) • Weight: up to 10.6 kg (23.4 lb)
Processor	Up to 95 W 8C Raptor Lake Xeon E-2400 or Pentium processor
Memory	Four UDIMM slots supporting up to 128 GB • TruDDR5 4800MHz (1Rx8) ECC UDIMM: 16 GB (1Rx8) • TruDDR5 4800MHz (2Rx8) ECC UDIMM: 32 GB (2Rx8) Note: Memory operates at up to 4400 MHz, depending on the processor selected and DIMM population order.
Storage	Three 3.5-inch drive bays (two optional), one 2.5-inch drive bay (optional), and one ODD bay (optional) Note: Only SATA drives are supported. No SAS or NVMe drives are supported on the ST50 V3.
RAID	• Hardware RAID (RAID level 0, 1, and 5) – ThinkSystem RAID 5350-8i PCIe 12Gb Adapter • Software RAID (RAID level 0, 1, and 5) – Intel VROC SATA RAID
Host bus	ThinkSystem 4350-8i SAS/SATA 12Gb HBA

Features and specifications

Feature	Specification
Network	• Two 1 Gbps RJ45 Ethernet connectors • One 1 Gbps RJ45 XCC network connector
PCIe slots	• PCIe slot 1: PCIe 4.0 x4, FH/HL, 25 W • PCIe slot 2: PCIe 5.0 x16, FH/HL, 75 W • PCIe slot 3: PCIe 4.0 x4, FH/HL, 25 W
Front I/O	• One USB 3.2 Gen 1 (5 Gbps) connector • One USB 2.0 connector with XCC mobile support
Rear I/O	• One serial connector • One VGA connector • One XCC network connector • Two Ethernet connectors (Ethernet connector 1 is shared with the XCC network connector) • Four USB 3.2 Gen 1 (5 Gbps) connectors
Fans	• When the processor TDP is lower than or equal to 80 W: – One front fan – One rear fan (required when a 3.5-inch drive is in drive bay 2 and/or an M.2 boot adapter is in drive bay 3) – One processor cooler fan

Features and specifications

Feature	Specification
	– One 95 W L-shaped processor heat sink fan (occupies the rear fan assembly location)
Power supply	The server supports one of the following non-hot-swap, non-redundant power supplies (Input power 115 VAC or 230 VAC): • Fixed ATX 300-watt Single-Output Gold • Fixed ATX 500-watt Multi-Output Platinum (required for eight-core processors)
Management	• Lenovo XClarity Controller 2 (with hardware RoT module) • Lenovo XClarity Administrator • Lenovo XClarity Essentials • Lenovo XClarity Provisioning Manager • Lenovo XClarity Energy Manager • Lenovo Capacity Planner • Lenovo XClarity Integrator
OS	• Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server • Ubuntu

[No Title]

ST50 V2 and ST50 V3 specification comparison

Feature	ST50 V2	ST50 V3
Form factor	• 1S Entry Tower (17L) • Support for Intel Tatlow Rocket Lake full stack – 14 nm (Only PSU ATX-500W can support for 8C processor) • Tiger Lake PCH: C256	• 1S Entry Tower (17L) • Support for Intel Catlow Raptor Lake-E full stack – 10 nm (Only ATX-500W PSU can support for 8C processor) • Raptor Lake PCH-S: C266
Compute	Up to 95 W 8C Rocket Lake Xeon E-2300 or Pentium Processor	Up to 95 W 8C Raptor Lake Xeon E-2400 or Pentium Processor
GPU	NVIDIA Quadro T1000 PCIe Active GPU	N/A
Memory	• Up to four UDIMM slots, 3200 MHz, max. 128 GB (Xeon E-23xx SKUs) • Up to four UDIMM slots, 2666 MHz, max. 128 GB (Pentium SKUs) • TruDDR4 ECC (8GB/16GB/32GB) Memory	• Up to four UDIMM slots, up to 128 GB. • TruDDR5 ECC UDIMM, 4400 (2SPC - 1DIMM), 4000 (2SPC - 2DIMM 1R), 3600 (2SPC - 2DIMM 2R) • (2SPC = Platform design supports four physical DIMM slots)
Storage	• Two 3.5-inch HDDs, (one for Optional); one 2.5-inch HDD – a total of three HDD drives • One M.2 SSD/Optane (2280 NVMe PCIe Standard M.2 Module) • One slim SATA ODD bay	• Three 3.5-inch HDDs, one 2.5-inch HDD – a total of four SATA drives • One ThinkSystem M.2 SATA 2-Bay Enablement Adapter (Optional) • One slim SATA ODD bay (Optional) • One Internal USB 3.2 G1 (5 Gbps) vertical Type-A Port

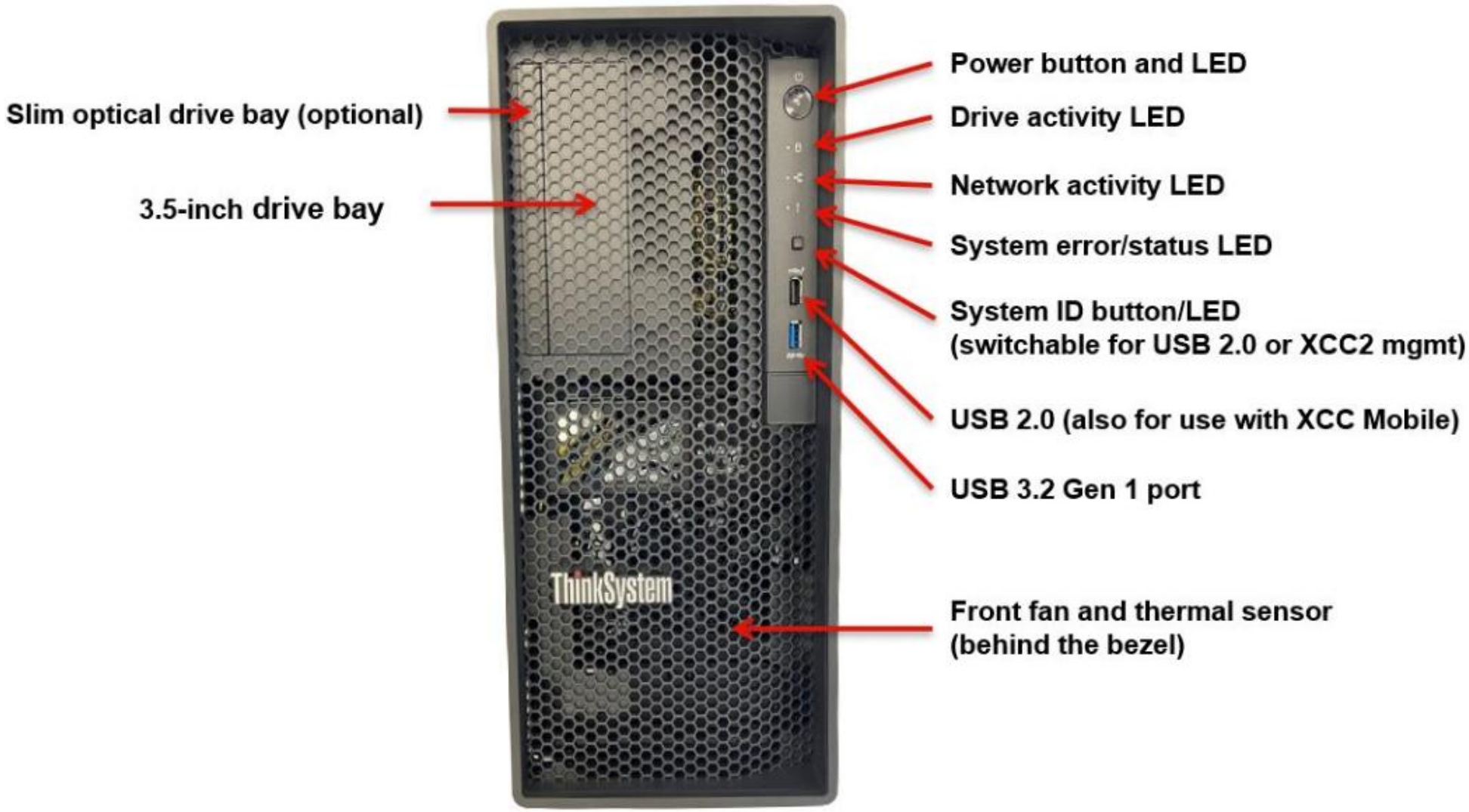
ST50 V2 and ST50 V3 specification comparison

Feature	ST50 V2	ST50 V3
RAID	• Intel VROC SW RAID • HW RAID support (limited)	• Intel VROC SW SATA RAID • HW RAID support
Cooling	Two system fans (front drive bay and rear), one CPU fan	Two system fans (front drive bay and rear), one CPU heat sink fan
Networking	One 1 GbE Embedded (Intel I219-LM)	• Two 1 GbE Embedded (Broadcom BCM5720) • One 1 GbE Dedicated Management port
Management	• Intel AMT 15 Management • TPM embedded: TPM 2.0 (Only) • LXPM Lite	XClarity Controller 2 embedded management (with hardware RoT module)
PCIe slots	• x16 lane PCIe 4.0 in x16 slot (Slot 1: From CPU) • x1 lane PCIe 3.0 in x1 slot (Slot 2: From PCH) • x4 PCIe 3.0 in x16 slot (Slot 3: From PCH)	• Slot-1 PCIe x4 slot with CPU PCIe 4.0 x4 lanes (Open-End) - power consumption up to 25 W • Slot-2 PCIe x16 slot with CPU PCIe 5.0 x16 lanes - power consumption up to 75 W only • Slot-3 PCIe x4 slot with PCH PCIe 4.0 x4 lanes (Open-End) - power consumption up to 25 W
Front I/O	• Button: Power button & LED • One Thermal Sensor Cable (Front Bezel in-side)	• Button: Power button • One USB 3.2 port

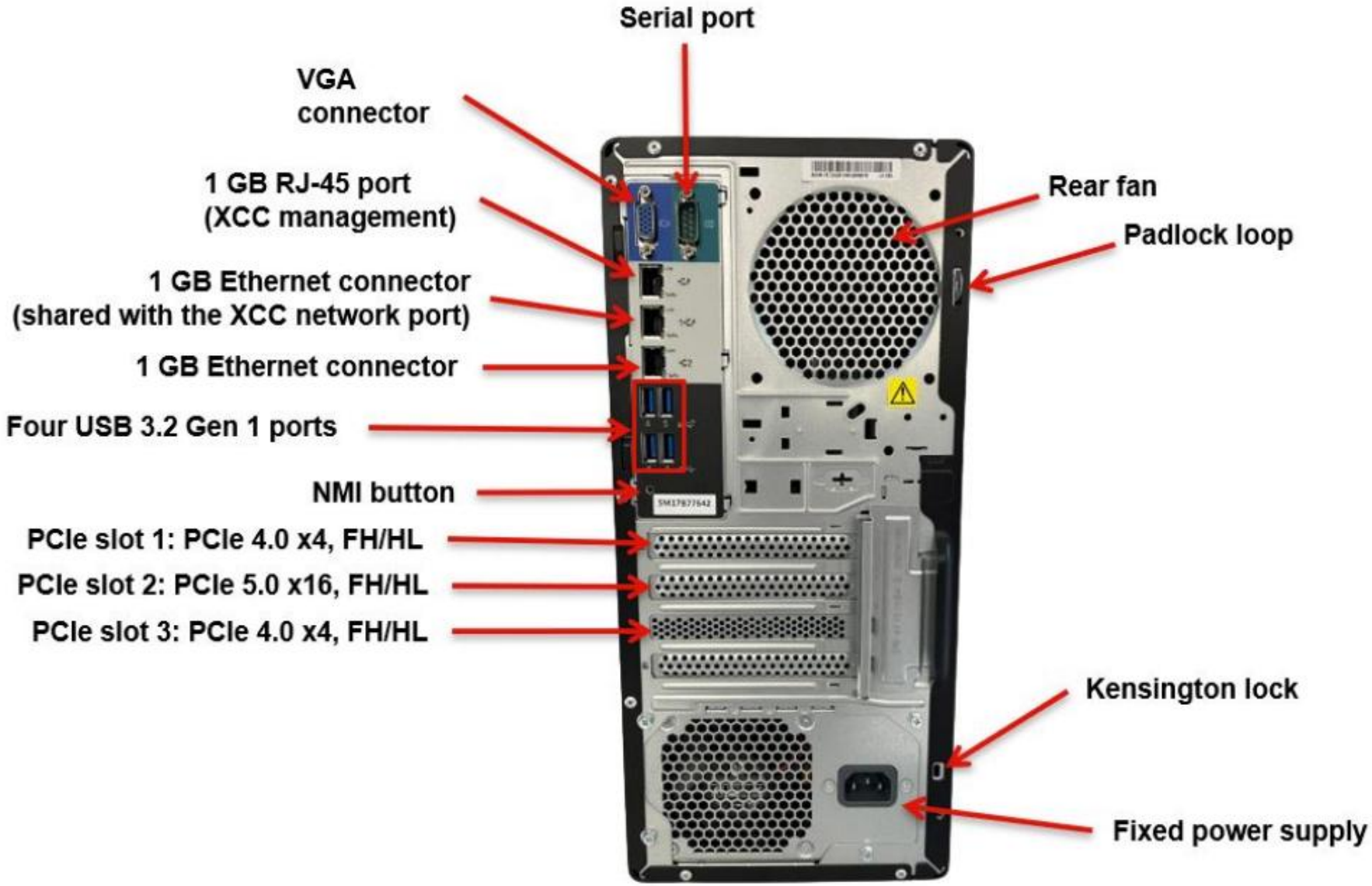
ST50 V2 and ST50 V3 specification comparison

Feature	ST50 V2	ST50 V3
	[illegible]	[illegible] up to 75 W only • Slot-3 PCIe x4 slot with PCH PCIe 4.0 x4 lanes (Open-End) - power consumption up to 25 W
Front I/O	• Button: Power button & LED • One Thermal Sensor Cable (Front Bezel in-side) • One USB 3.2 Gen 2 (10 Gbps) Type C port • Two USB 3.2 Gen 1 (5 Gbps), two USB 3.2 Gen 2 (10 Gbps) ports • One Combo Audio Jack, one mic	• Button: Power button • One USB 3.2 port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management) • LED indicators for system status. (Align with ISG Server front I/O, Button, LEDs.)
Rear I/O	• Four USB 3.2 Gen 1 (5 Gbps) ports • Two DP Ports • One Serial port • One 1 GbE LAN • One Audio line out	• Four USB 3.2 Gen 1 (5Gb) ports • Two RJ45 Ethernet Ports, one Dedicated Mgmt Port • One Serial COM Port, one VGA port, one NMI button
Power supply	Supports a fixed PSU – ATX-300W (90%) Gold / ATX-500W (92%) Platinum Meets ERP Lot9 in 2023 - New ATX-500W (94%) Platinum	• Supports a fixed PSU – ATX-300W (90%) Gold • Meets ERP Lot9 in 2023 - New ATX-500W (94%) Platinum

Front view


Slim optical drive bay (optional)
3.5-inch drive bay
Power button and LED
Drive activity LED
Network activity LED
System error/status LED
System ID button/LED
(switchable for USB 2.0 or XCC2 mgmt)
USB 2.0 (also for use with XCC Mobile)
USB 3.2 Gen 1 port
Front fan and thermal sensor
(behind the bezel)
ThinkSystem

Rear view


Serial port
VGA connector
1 GB RJ-45 port (XCC management)
1 GB Ethernet connector (shared with the XCC network port)
1 GB Ethernet connector
Four USB 3.2 Gen 1 ports
NMI button
PCIe slot 1: PCIe 4.0 x4, FH/HL
PCIe slot 2: PCIe 5.0 x16, FH/HL
PCIe slot 3: PCIe 4.0 x4, FH/HL
Rear fan
Padlock loop
Kensington lock
Fixed power supply

Inside views

Processor TDP <= 80 W

Processor cooler
(CPU TDP <= 80 W)

Intrusion switch cable

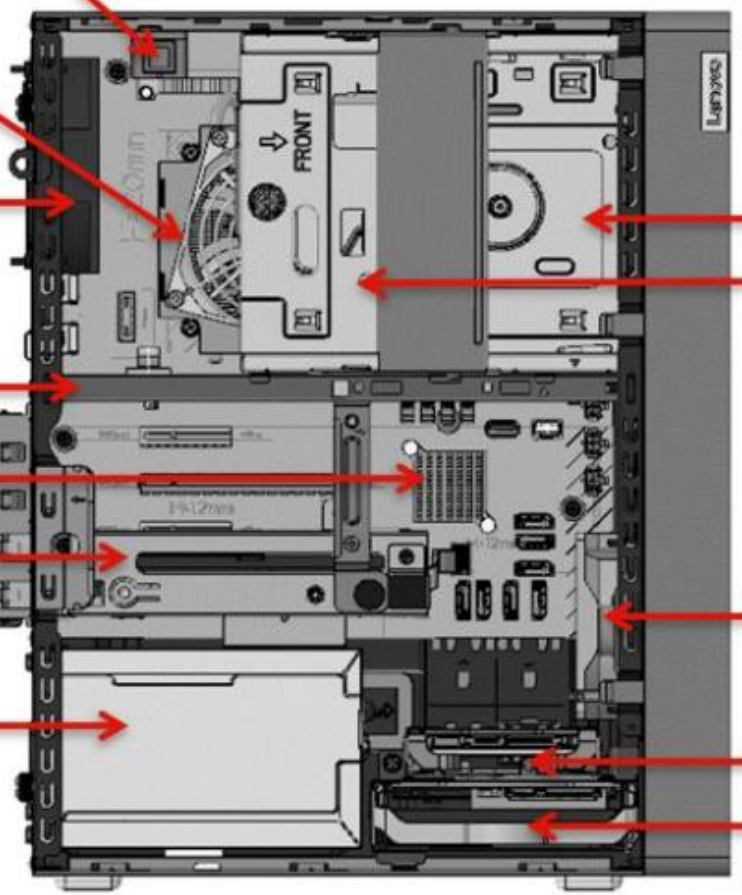
Rear fan
(drive in bay 2 and/or M.2 in bay 3)

Chassis beam

Intel C266 motherboard

Drive bay 3
(3rd 3.5-inch drive or M.2 adapter)

Fixed ATX PSU



Slim ODD bay

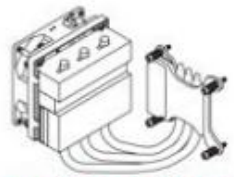
Drive bay 2
(2nd 3.5-inch drive)

Front fan

Drive bay 1
(2.5-inch drive)

Drive bay 0
(1st 3.5-inch drive)

Processor TDP > 80 W



95 W heat sink fan
(CPU TDP > 80 W)