

PERFORMANCE

Processor

Processor Family

Up to one Intel® Xeon®, Core™ i9, i7, i5, or i3 processor

Processor

| Processor Name | Cores | Threads | Base Frequency | Max Frequency | Cache | Memory Support | Processor Graphics |
|----------------|-------|---------|----------------|---------------|-------|----------------|-------------------------|
| Core i3-8100 | 4 | 4 | 3.6GHz | - | 6MB | DDR4-2400 | Intel UHD Graphics 630 |
| Core i3-8300 | 4 | 4 | 3.7GHz | - | 8MB | DDR4-2400 | Intel UHD Graphics 630 |
| Core i3-9100 | 4 | 4 | 3.6GHz | 4.2GHz | 6MB | DDR4-2400 | Intel UHD Graphics 630 |
| Core i3-9300 | 4 | 4 | 3.7GHz | 4.3GHz | 8MB | DDR4-2400 | Intel UHD Graphics 630 |
| Core i5-8500 | 6 | 6 | 3.0GHz | 4.1GHz | 9MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i5-9400 | 6 | 6 | 2.9GHz | 4.1GHz | 9MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i5-9400F | 6 | 6 | 2.9GHz | 4.1GHz | 9MB | DDR4-2666 | - |
| Core i5-9500 | 6 | 6 | 3.0GHz | 4.4GHz | 9MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i5-9600 | 6 | 6 | 3.1GHz | 4.6GHz | 9MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i5-9600K | 6 | 6 | 3.7GHz | 4.6GHz | 9MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i7-8700 | 6 | 12 | 3.2GHz | 4.6GHz | 12MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i7-8700K | 6 | 12 | 3.7GHz | 4.7GHz | 12MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i7-9700 | 8 | 8 | 3.0GHz | 4.7GHz | 12MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i7-9700K | 8 | 8 | 3.6GHz | 4.9GHz | 12MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i9-9900 | 8 | 16 | 3.1GHz | 5.0GHz | 16MB | DDR4-2666 | Intel UHD Graphics 630 |
| Core i9-9900K | 8 | 16 | 3.6GHz | 5.0GHz | 16MB | DDR4-2666 | Intel UHD Graphics 630 |
| Xeon E-2174G | 4 | 8 | 3.8GHz | 4.7GHz | 8MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2186G | 6 | 12 | 3.8GHz | 4.7GHz | 12MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2224 | 4 | 4 | 3.4GHz | 4.6GHz | 8MB | DDR4-2666 | - |
| Xeon E-2224G | 4 | 4 | 3.5GHz | 4.7GHz | 8MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2226G | 6 | 6 | 3.4GHz | 4.7GHz | 12MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2234 | 4 | 8 | 3.6GHz | 4.8GHz | 8MB | DDR4-2666 | - |
| Xeon E-2236 | 6 | 12 | 3.4GHz | 4.8GHz | 12MB | DDR4-2666 | - |
| Xeon E-2244G | 4 | 8 | 3.8GHz | 4.8GHz | 8MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2246G | 6 | 12 | 3.6GHz | 4.8GHz | 12MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2274G | 4 | 8 | 4.0GHz | 4.9GHz | 8MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2276G | 6 | 12 | 3.8GHz | 4.9GHz | 12MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2278G | 8 | 16 | 3.4GHz | 5.0GHz | 16MB | DDR4-2666 | Intel UHD Graphics P630 |
| Xeon E-2286G | 6 | 12 | 4.0GHz | 4.9GHz | 12MB | DDR4-2666 | Intel UHD Graphics P630 |

Processor Sockets

1x FCLGA1151

Operating System

Operating System

- Windows® 10 Pro 64
- Windows 10 Pro 64 for Workstations
- Ubuntu Linux LTS
- No operating system

Graphics

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Integrated Graphics

- Intel UHD Graphics 630
- Intel UHD Graphics P630
- None

Discrete Graphics Support

Supports up to one NVIDIA® Quadro® RTX 4000, or two NVIDIA Quadro P2200, 400W PSU is needed

Discrete Graphics Offering

| Graphics | Memory | Power | Connector | SLI / NVlink |
|-----------------|-------------|-------|-----------------------|--------------|
| Quadro P2000 | 5GB GDDR5 | 75W | 4x DP | None |
| Quadro P400 | 2GB GDDR5 | 30W | 3x miniDP | None |
| Quadro P620 | 2GB GDDR5 | 40W | 4x miniDP | None |
| Quadro P1000 | 4GB GDDR5 | 50W | 4x miniDP | None |
| Quadro P2200 | 5GB GDDR5 | 75W | 4x DP | None |
| Quadro P4000 | 8GB GDDR5 | 120W | 4x DP | None |
| Quadro P5000 | 16GB GDDR5X | 180W | 1x DVI-D DL, 4x DP | None |
| Quadro RTX 4000 | 8GB GDDR6 | 160W | 3x DP, 1x VirtualLink | None |

Monitor Support

Monitor Support

Supports multiple displays via onboard video ports and discrete graphics, the number of maximum monitors supported depends on the graphic card in use

Chipset

Chipset

Intel C246 chipset

Memory

Max Memory^[1]

Up to 64GB

Memory Type

- DDR4-2666 UDIMM ECC
- DDR4-2666 UDIMM non-ECC

Memory Slots

4 DIMM sockets with 2 channels

Memory Protection

ECC on models with ECC DIMMs and Xeon processor

Notes:

1. The max memory is based on the test results with current Lenovo® memory offerings. The system may support more memory as the technology develops.

Storage

Storage Support

Up to 3x 3.5" SATA HDD / 4x 2.5" SATA HDD / SSD + 3x M.2 PCIe® SSD

- 3.5" HDD up to 4TB each
- 2.5" SATA HDD up to 500GB each
- 2.5" SATA SSD up to 1TB each
- M.2 SSD up to 1TB each
- Optional Intel Optane™ Memory

Storage Type

| Disk Type | Interface | RPM | Offering |
|---------------|------------|-----|----------|
| Optane Memory | PCIe NVMe® | - | 32GB |

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| | | | |
|---------------|---------------|------|---------------------------|
| 2.5" SATA HDD | SATA 6Gb/s | 7.2K | 500GB FIPS |
| 2.5" SATA SSD | SATA 6Gb/s | - | 256GB / 512GB / 1TB |
| 3.5" SATA HDD | SATA 6Gb/s | 7.2K | 1TB / 2TB / 4TB |
| M.2 PCIe SSD | PCIe 4.0 NVMe | - | 256GB / 512GB / 1TB / 2TB |

Storage Controllers

| Storage Controller | Type | Interface | RAID | Cache |
|-----------------------------|----------|--------------|----------|-------|
| Onboard Intel RST SATA RAID | Standard | SATA 6.0Gb/s | 0/1/10/5 | None |
| Onboard Intel RST PCIe RAID | Standard | PCIe NVMe | 0/1 | None |

Removable Storage

Optical Support

Optional one 9.0mm optical drive, DVD-ROM, DVD±RW, and Blu-ray

Card Reader

- SD card reader
- No card reader

Multi-Media

Audio Chip

High Definition (HD) Audio, Realtek® ALC233 codec

Power Supply

Power Supply

| Power | Type | Efficiency | Key Features |
|-------|-------|------------|---|
| 250W | Fixed | 92% | 100V - 240V, Climate Savers Computing Platinum and 80 PLUS Platinum qualified |
| 400W | Fixed | 92% | 100V - 240V, Climate Savers Computing Platinum and 80 PLUS Platinum qualified |

DESIGN

Mechanical

Form Factor

Tower (18L)

Dimensions (WxDxH)

| Models | Dimensions |
|------------|---|
| All models | 165 x 328 x 376 mm (6.5 x 12.9 x 14.8 inches) |

Weight

| Models | Weight |
|------------|--------------------|
| All models | 9.8 kg (21.61 lbs) |

Bays

- 1x 3.5" disk bay (standard)
- 1x 2.5" disk bay (optional, comes with disk or Storage Bay Upgrade Kit)
- 2x 3.5" disk bay (optional):
 - 1 bay come with disk or Storage Bay Upgrade Kit
 - 1 bay via Flex bay

Flex Bays

1x Flex bay, supports one of the following:

- Flex module for optional front eSATA/Thunderbolt™/IEEE1394
- 3rd disk bay, 3.5" or 2.5", removable, via Front Access Storage Enclosure, using SATA 4 connector as eSATA mode
- 3rd disk bay, 3.5" or 2.5", via 5.25" to 3.5" HDD Kit

M.2 Slots

Up to 3x M.2 SSD:

- 1 via onboard slot
- 2 via Single M.2 to PCIe adapter

Expansion Slots

- One PCIe 3.0 x1
- Two PCIe 3.0 x16

Expansion Slots Offering

Slot 1: PCIe 3.0 x16, full height, half length, links to CPU

Slot 2: PCIe 3.0 x1, full height, full length, links to PCH

Slot 3: PCIe 3.0 x16 (negotiable link width x4), full height, half length, links to PCH

CONNECTIVITY

Network

Onboard Ethernet

Gigabit Ethernet, Intel Ethernet Connection I219-LM, 1x RJ45, supports Wake-on-LAN

Optional Ethernet

Additional Ethernet options via PCIe adapter

WLAN + Bluetooth®

- Intel Wireless-AC 9560, 802.11ac Dual Band 2x2 Wi-Fi® + Bluetooth 5.1, M.2 card
- No WLAN and Bluetooth

Ports^[1]

Front Ports

- 2x USB 3.1 Gen 1
- 2x USB 3.1 Gen 2
- 1x USB-C 3.1 Gen 1
- 1x headphone / microphone combo jack (3.5mm)
- 1x microphone (3.5mm)

Optional Front Ports

- 1x eSATA (with flex module)
- 2x Thunderbolt (with flex module, USB-C form, one supports video-out)
- 1x IEEE1394 (with flex module)

Rear Ports^[3]

- 2x USB 2.0
- 2x USB 3.1 Gen 1
- 2x DisplayPort™
- 1x serial (9-pin)
- 1x Ethernet (RJ-45)
- 1x line-out (3.5mm)

Optional Rear Ports

- 1x video (DisplayPort or HDMI®)
- 2x USB 2.0
- 2x USB 3.1 Gen 1 (via 2-port USB expansion card)
- 2x USB-C 3.1 Gen 1 (via 2-port USB-C expansion card)
- 1x Thunderbolt
- 1x serial
- 4x serial (via 4-port serial expansion card, PCIe x1)
- 1x parallel
- 2x PS/2

Notes:

1. The transfer speed of following ports will vary and, depending on many factors, such as the processing speed of the host device, file attributes and other factors related to system configuration and your operating environment, will be slower than theoretical speed.
USB 2.0: 480 Mbit/s;
USB 3.2 Gen 1 (SuperSpeed USB 5Gbps, formerly USB 3.0 / USB 3.1 Gen 1): 5 Gbit/s;
USB 3.2 Gen 2 (SuperSpeed USB 10Gbps, formerly USB 3.1 Gen 2): 10 Gbit/s;
USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s;
Thunderbolt 3: 40 Gbit/s;
FireWire 400: 400 Mbit/s;

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- FireWire 800: 800 Mbit/s
- 2. For video ports on discrete graphics, please see graphics section
- 3. DP needs Core, Pentium®, or -G suffix Xeon processor

SECURITY & PRIVACY

Security

Security Chip

Discrete TPM 2.0, TCG certified

Physical Locks

- (Optional) Cable lock
- (Optional) E-lock
- Kensington® Security Slot
- Padlock Loop

Chassis Intrusion Switch

- Chassis intrusion switch
- No chassis intrusion switch

BIOS Security

- Administrator password
- Power-on password

MANAGEABILITY

System Management

System Management

- Intel vPro with Intel AMT 12 (vPro-enable processor and WiFi needed)
- Standard Manageability

SERVICE

Warranty

Base Warranty^[1]

- 1-year limited onsite service
- 3-year limited onsite service
- No base warranty

Notes:

1. More information of warranty policy, please access <https://pcsupport.lenovo.com/warranty>

ENVIRONMENTAL

Operating Environment

Temperature

Operating: 10°C (50°F) to 35°C (95°F)

Altitude

Operating: -15.2 m (-50 ft) to 3048 m (10,000 ft)

Humidity

Operating: 20% to 80%

CERTIFICATIONS

Green Certifications

Green Certifications

- EPEAT™ Silver
- ENERGY STAR® 8.0
- GREENGUARD®
- RoHS compliant

ISV Certifications

ISV Certifications

Please visit www.thinkworkstations.com/isv-certifications/

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