

Lenovo ThinkStation P620

Version: 1.0 | 02/02/2021

DOWNLOADS

| | |
|-----------------------------|---|
| Hardware Maintenance Manual | P620 HMM |
| Drivers & Software | P620 Drivers & Software |

SECTION I: Platform Overview

| | |
|-------------|--|
| Description | Introducing the new ThinkStation P620. The first ever AMD Ryzen Threadripper PRO powered workstation offers stunning performance with up to 64 cores and up to 4.0GHz. Perfect for those who demand more power for today's multithreaded applications, the P620 combines Lenovo's legendary reliability and customer-driven innovation with professional manageability and enterprise-class support. |
|-------------|--|

CPU

| | |
|-------------------|---------------------------------------|
| Processor Support | AMD Castle Peak Workstation Processor |
| Socket Type | Socket-SP3 (SM-LGA) |

Operating Systems

| | |
|-----------|--|
| Preloaded | Windows 10 Pro 64-bit Ubuntu 20.04 LTS (configuration specific) |
| Supported | Ubuntu 20.04 LTS Red Hat Enterprise Linux 8.3 |

Memory

| | |
|-------------------|---|
| Slots | Up to 8 DIMMs |
| Channels | Supports up to 8 DIMM Sockets, 8 Channels |
| Type | 288-Pin, 3200MHz ECC RDIMM |
| ECC Support | Yes |
| Speed | Up to 3200MHz |
| Max DIMM Size | 128GB |
| Max System Memory | 1TB |

Storage

| | |
|-----------------|---|
| Total Bays/Size | 4 x 3.5" |
| SATA | 6 x SATA Connectors, Gen 3 |
| PCIe | 2 x M.2 PCIe Connectors Onboard, Gen 4 Additional M.2 NVMe Drives Supported by Single Adapters |
| eSATA | 1 x eSATA Connector, Gen 3 |
| Disclaimers | Additional parts/enclosures may be required for some configurations |

Video

| | |
|---------------------|--|
| Integrated Graphics | Not Available |
| Discrete Graphics | PCIe Add-In-Card, Details in Section Below |
| Multi-GPU Support | Yes |
| Type | PCIe Add-In-Card |
| Bus Interface | PCIe x16 |
| Slot 1 | PCIe 4.0 x16, Full Height, Full Length, 75W, Without Latch |
| Slot 2 | PCIe 4.0 x8, Full Height, Full Length, 25W, Open-Ended |
| Slot 3 | PCIe 4.0 x16, Full Height, Full Length, 75W, With Latch |
| Slot 4 | PCIe 4.0 x16, Full Height, Full Length, 75W, With Latch |
| Slot 5 | PCIe 4.0 x16, Full Height, Full Length, 75W, With Latch |
| Slot 6 | PCIe 4.0 x8, Full Height, Full Length, 25W, Open-Ended |

Front I/O

| | |
|-----|--|
| USB | 2 x USB 3.2 Gen 2 Type-C (15W) 1 x USB 3.2 Gen 2 Type-A (11W) 1 x USB 3.2 Gen 2 Type-A |
| | |

| | |
|-------------------|---|
| Audio | 1 x Front Stereo + MIC Headset |
| Media Card Reader | Optional: Front 15-in-1 Media Card Reader supporting SD-UHS-II (requires Flex module) |
| Flex Module | <p>Flex Module: Supports Two 5.25" Flex Bays With Several Options Integrated</p> <ul style="list-style-type: none"> • Up to Two 5.25" Slim ODD Cages • Up to One 5.25" Slim ODD and HDD Cage (FBSE) • Up to One Front Access Storage Enclosure (FASE) • Up to Two Front Removable Drive Enclosure - M.2 (CRU) • Up to One Flex Module for One or More of the Following Options: <ul style="list-style-type: none"> - 9.0mm Optical/15-in-1 USB 3.1 Gen 1 Reader/Front USB 3.1 Gen 1 Type-C/Front eSATA <p>Note:</p> <ol style="list-style-type: none"> 1. Only one 15-in-1 media card reader can be supported. 2. Only one USB 3.1 Gen 1 Type-C cable can be supported. 3. Only one front eSATA cable can be supported. |
| Disclaimers | Not all components above available concurrently in a single Flex module |

Rear I/O

| | |
|--------------------------|--|
| USB | 4 x USB 3.2 Gen 2 Type-A 2 x USB 2.0 Type-A |
| Audio | 3 x Rear (Line Out, Line In, MIC); Retaskable to 5.1 |
| DisplayPort | As Supported by GPU |
| HDMI | As Supported by GPU |
| DVI | As Supported by GPU |
| VirtualLink | As Supported by GPU |
| VGA Port | As Supported by GPU |
| Serial Port | Optional 1 x Rear Port |
| Ethernet | 1 x 10GbE - RJ45 |
| PS/2 | 2 x PS/2 |
| IEEE 1394 | Not Available |
| eSATA | Optional PCIe Bracket |
| Parallel Port | Not Available |
| Optional USB Adapter | Not Available |
| Optional Network Adapter | Aquantia Single Port 10G Ethernet Adapter PCI-E 1 x WiFi Card With BT HP External Antenna Kit (9260 AC) |

Ethernet

| | |
|------------|--------------------------------------|
| Vendor | Marvell AQC107 10G Ethernet |
| Speeds | 10G/5G/2.5G/1G/100Mbps |
| Functions | PXE, ASF, WOL, Jumbo Frames, Teaming |
| Connectors | 1 x RJ45 |

Audio

| | |
|---------------------------------|--|
| Vendor | Realtek |
| Type | HD (5.1) |
| Internal Speaker | Yes |
| Connectors | 3 x Rear 3.5mm Jacks (Line In, Line Out, Microphone In) |
| Chipset | ALC4050 |
| Number of Channels | 6 (rear) + 2 (front) |
| Number of Bits/Audio Resolution | 6 Channel DAC supports 16/20/24 bit PCM Stereo ADC supports 16/20 bit PCM |

Thermal

| | |
|--------------|--|
| Temp Sensors | CPU VR Sensor - Thermal Diode - Connected to Super I/O PCI Zone 1 Sensor - Thermal Thermistor - Connected to Super I/O PCI Zone 2/Chipset Sensor - Thermal Thermistor - Connected to Super I/O PCI Zone 3 Sensor - Thermal Diode - Connected to Super I/O M.2 Sensor - Thermal Thermistor - Connected to Super I/O Ambient Cabled Sensor - Thermal Diode - Connected to Super I/O PSU Thermal Sensor - Thermal Thermistor - Connected to Super I/O |
| Fans | 2 x CPU Fan 4-pin Header With 3-pin Key 1 x Rear System Fan 4-pin Header With 3-pin Key 1 x Front System Fan 4-pin Header With 3-pin Key 2 x ODD Bay Fan 4-pin Header With 3-pin Key (optional) 2 x Memory Fan 4-pin Header with 3-pin Key 1 x PSU Fan Main PSU Power Connector |

Power Specifications

| | |
|---|------------------------------|
| Power Supply | 1000W |
| Power Efficiency | 92% Efficient @ 50% Load |
| Main | C14 |
| Operating Voltage Range | 100 - 240V |
| Rated Voltage Range | 90-264VAC |
| Rated Line Frequency | 47Hz / 63Hz |
| Operating Line Frequency Range | 50Hz / 60Hz |
| Rated Input Current | 9A-15A |
| Graphics | 2 x 8 pin (6+2) 2 x 6 pin |
| Power Supply Fan | Yes |
| ENERGY STAR® Qualified (config dependent) | Yes |
| 80 PLUS Compliant | Yes |

| | |
|-------------------------------|-----|
| Built-in Self Test (BIST) LED | Yes |
| Aux Power Drop | Yes |

BIOS

| | |
|--------|-----|
| Vendor | AMI |
|--------|-----|

Chassis Information

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|-------------------|---|
| Color | Graphite Black |
| PSU | 1000W Available, Autosensing, 92% PSU, 80 PLUS Platinum Qualified |
| Thermal Solutions | Two System Fans Standard (1 front, 1 rear), One PSU Fan, Two CPU Fans, Two MEM Fans |
| Dimensions | 440mm/17.3" H x 460mm/18.1" D x 165mm/6.5" W |
| Weight | 24kg / 52.9lbs |

Packaging Dimensions

| | |
|------------------|---|
| Height (mm/in) | 575mm / 22.64" |
| Width (mm/in) | 302mm / 11.89" |
| Depth (mm) | 580mm / 22.83" |
| Weight (kgs/lbs) | 27.48kg / 60.58lbs |
| Disclaimers | Note: Actual Weight of the packaging will depend on the system configuration. |

Security & Serviceability

| | |
|--|--|
| TPM | Infineon SLB9670 TPM 2.0 |
| Asset ID | Yes, 1024 x 8bit |
| vPro | NA |
| Cable Lock Support | Yes, Optional Kensington Cable Lock |
| Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control | Yes |
| Power-On Password | Yes |
| Setup Password | Yes |
| NIC LEDs (integrated) | Yes |
| Access Panel Key Lock | Unique Key Lock Kit - Optional Common Key Lock Kit - Optional |

| | |
|---|--|
| Boot Sequence Control | Yes |
| Padlock Support | Not Supported |
| Boot without keyboard and/or mouse | Yes |
| Access Panel | Tool-less Side Cover Removal |
| Optical Drive | Tool-less |
| Hard Drives | Tool-less |
| Expansion Cards | Tool-less |
| Processor Socket | Retained With Screws |
| Color coded User Touch Points | Yes |
| Color-coordinated Cables and Connectors | Yes |
| Memory | Tool-less |
| System Board | Retained With Screws |
| Restore CD/DVD/USB Set | Not Included, Restore Media Available via Lenovo Customer Support Center |

Operating Environment

| | |
|-----------------|--|
| Air Temperature | Operating: 10°C to 35°C (50°F to 95°F) |
| Storage | Storage: -40°C to 60°C (-40°F to 140°F) in Original Shipping Carton Storage: -10°C to 60°C (14°F to 140°F) Without Carton |
| Humidity | Relative Humidity Operating: 10% to 80% (non-condensing) Relative Humidity Storage/Transit: 10% to 90% (non-condensing) Wet Bulb Temperature Operating: 25°C (77°F) max Wet Bulb Temperature Non-operating: 40°C (104°F) max |
| Altitude | Operating: -15.2m to 3048m (-50ft to 10000ft) Storage: -15.2m to 10668m (-50ft to 35000ft) |
| Vibration | Package Vibration: Random,1.04G at 2-200 Hz, 15 Minutes XYZ 6 faces Operating Vibration: Random,0.27G at 5-500 Hz, 30 Minutes Per Surface (X,Y,Z) Non-Operating Vibration: Random,1.04G at 2-200 Hz, 15 Minutes Per Surface (±X,±Y,±Z) |
| Shock | Operation Shock: 3ms (15G) for 4 Axis (+X, -X, +Y,-Y) 3ms (30G) for 2 Axis (+Z, -Z), Half-sine Wave, Each Side Will do One Time Rack Operation Shock: 5ms (15G) for 6 Axis (+X, -X, +Y,-Y,+Z, -Z), Half-sine Wave, Each Side Will do One Time Non-operating Shock: Trapezoidal Wave, 35G, 11ms, 6 Sides (+X, -X, +Y,-Y, +Z, -Z), Filter 300Hz, Each Side Shock One Time |

SECTION II: Platform Detail

| | |
|------------|----------------------------------|
| Board Size | 13.44" x 9.96" (341.5mm x 253mm) |
| Layout | Custom ATX |

Motherboard Core

| | |
|----------------------|---|
| Processor Support | AMD Castle Peak Workstation processor |
| Socket Type | Socket-SP3 (SM-LGA) |
| Memory Support | DDR4 up to 3200MHz RDIMM Memory |
| CPU-CPU Interconnect | N/A |
| Voltage Regulator | IR35204MTRPBF+TDA21475 IR35201MTRPBF+TDA21475 |
| Chipset (PCH) | AMD 2019 Premium Chipset BXB-B |
| Flash | 32MB |
| Super I/O | Nuvoton NCT6686D-L |
| Clock | AMD Integrated Clock |
| Audio | Realtek ALC4050H Codec on Motherboard Realtek ALC4050 on Front Panel I/O |
| Ethernet | Marvell AQC10710Gb DASH |

Supported Components

| | |
|-----------------|--|
| Processor Level | Castlepeak |
| Processor | AMD Threadripper Pro 3945WX 4.0GHz/12C/64M/3200/280W AMD Threadripper Pro 3955WX 3.9GHz/16C/64M/3200/280W AMD Threadripper Pro 3975WX 3.5GHz/32C/128M/3200/280W AMD Threadripper Pro 3995WX 2.7GHz/64C/256M/3200/280W |
| Memory Type | RDIMMs - 3200MHz |
| Memory | 16GB DDR4 ECC RDIMM PC4-3200 32GB DDR4 ECC RDIMM PC4-3200 64GB DDR4 ECC RDIMM PC4-3200 |

Storage

| | |
|----------------------------------|--|
| 3.5" SATA Hard Disk Drive (HDD) | 1TB SATA HDD 7200rpm, 6Gb/s, 3.5" 2TB SATA HDD 7200rpm, 6Gb/s, 3.5" 4TB SATA HDD 7200rpm, 6Gb/s, 3.5" (enterprise class) |
| M.2 PCIe Solid State Drive (SSD) | 256GB M.2 PCIe SSD, Gen 3 x4, NVMe, OPAL 512GB M.2 PCIe SSD, Gen 3 x4, NVMe, OPAL 1024GB M.2 PCIe SSD, Gen 3 x4, NVMe, OPAL 2048GB M.2 PCIe SSD, Gen 3 x4, NVMe, OPAL 256GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL 512GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL 1024GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL 2048GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL |

RAID

| | |
|------------------------------|---|
| RAID Levels and Requirements | M.2 RAID via AMD CPU – supports RAID 0, 1 SATA RAID via Onboard AMD SATA Controller – supports RAID 0, 1, 5, 10 |
| Notes | Supported RAID levels for a system will vary from the stated capabilities of the RAID controller due to dependencies on the number and capacity of physical disks in the system and on customer requirements for performance, fault tolerance, or data redundancy. Max supported RAID 0/1/5/10. |

Optical Drive/Removable Media

| | |
|----------------------------------|--|
| DVD-ROM Drive | DVD-ROM, 9.0mm Slim, SATA |
| DVD Burner/CD-RW Drive | DVD Burner/CD-RW Rambo, 9.0mm Slim, SATA |
| Blu-Ray Burner Drive | Blu Ray Burner w/AACS encryption, 9.0mm Slim, SATA |
| Media Card Reader Specifications | Optional Front USB 3.0 15-in-1 Media card reader supporting SD UHS-II (requires Flex module) |

Keyboard and Pointing Devices

| | |
|------------------|---|
| Keyboard | Traditional USB Keyboard Traditional PS/2 Keyboard Smart Card USB Keyboard Calliope USB Keyboard |
| Pointing Devices | Calliope USB Mouse Lenovo USB Laser Mouse Fingerprint USB Mouse PS/2 Optical Mouse |

Expansion Bays

| | |
|----------------------------|---|
| 5.25" External Access Bays | Flex Module: Supports Two 5.25" Flex Bays With Several Options Integrated <ul style="list-style-type: none">• Up to Two 5.25" Slim ODD Cages• Up to One 5.25" Slim ODD and HDD Cage (FBSE)• Up to One Front Access Storage Enclosure (FASE)• Up to Two Front Removable Drive Enclosure – M.2 (CRU)• Up to One Flex Module for One or More of the Following Options:<ul style="list-style-type: none">– 9.0mm Optical/15-in-1 USB 3.1 Gen 1 Reader/Front USB 3.1 Gen 1 Type-C/Front eSATA Note: <ol style="list-style-type: none">1. Only one 15-in-1 media card reader can be supported.2. Only one USB 3.1 Gen 1 Type-C cable can be supported.3. Only one front eSATA cable can be supported. |
|----------------------------|---|

PCIe Adapters

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|--------------------------|---|
| Network | Marvell 10G Ethernet Adapter (single port) Intel X550-T2 10G Ethernet Adapter (dual port) Intel I350-T4 1G Ethernet Adapter (quad port) |
| Thunderbolt | Rear Thunderbolt PCIe Adapter |
| WiFi Cards | Intel PCIe WiFi Card With BT (9260 AC) |
| PCIe to M.2 Adapter Card | Single M.2 PCIe Adapter Quad M.2 PCIe Adapter |

SECTION III: Supported Component Detail

CPU Specifications

| CPU | Ryzen Threadripper PRO 3995WX | Ryzen Threadripper PRO 3975WX | Ryzen Threadripper PRO 3955WX | Ryzen Threadripper PRO 3945WX |
|--------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| # of Cores | 64 | 32 | 16 | 12 |
| # of Threads | 128 | 64 | 32 | 24 |
| Processor Base Frequency | 2.7GHz | 3.5GHz | 3.9GHz | 4.0GHz |
| Max Turbo Frequency | 4.2GHz | 4.2GHz | 4.3GHz | 4.3GHz |
| Cache | 256MB | 128MB | 64MB | 64MB |
| TDP | 280W | 280W | 280W | 280W |

HDD Specifications

| Drive | 1TB SATA - 7200rpm, 6Gb/s, 3.5" | 2TB SATA - 7200rpm, 6Gb/s, 3.5" | 4TB SATA - 7200rpm, 6Gb/s, 3.5" (Enterprise) |
|---------------------------------|---------------------------------------|-------------------------------------|--|
| 3.5" SATA Hard Disk Drive (HDD) | Yes | Yes | Yes |
| 2.5" SATA Hard Disk Drive (HDD) | Not Available | Not Available | Not Available |
| Connector | SATA | SATA | SATA |
| Transfer Rate (Gb/sec) | Average Data Rate, Read/Write 156MB/s | Maximum data transfer rate 220 MB/s | Maximum data transfer rate 215 MB/s |
| Spindle Speed (RPM) | 7,200 | 7,200 | 7,200 |
| Power Off to Spindle Stop (sec) | NA | NA | NA |
| DC Power to Drive Ready (sec) | <10.0 | <17.0 | <17.0 |
| Average Latency (msec) | 4.16 | 6 | 4.16 |
| Input (VDC) | 5 | 5 | 5 |

| | | | |
|----------------------------|------------------------------|-----------------------------|---------------------------|
| Typical (Watts) | 6.19 | 6.7 | 7.35 |
| Idle (Watts) | 4.6 | 4.5 | 4.48 |
| Physical Dimensions | 101.6mm x 146.99mm x 19.88mm | 101.6mm x 146.99mm x 20.2mm | 101.85mm x 147mm x 26.1mm |
| Weight (grams) | 420 | 415 | 649 |
| Operating (C) Ambient | 0 to 60 | 0 to 60 | 5 to 60 |
| Operating (C) Base Casting | 60 | 60 | 60 |
| Non-Operating (C) Ambient | (-40 to 70) | (-40 to 70) | (-40 to 70) |
| Gradient (C per Hour) | 20 | 20 | 20 |
| Operating (Gs @ 2ms) | 70 | 80 | Read 70 Gs / Write 40 Gs |
| Non-Operating (Gs @ 2ms) | 350 | 350 | 300 |

Solid State Storage Specifications

| Drive | 2048GB M.2 SSD, NVMe, Opal, GEN4x4, TLC,2280 | 1024GB M.2 SSD, NVMe, Opal, GEN4x4, TLC,2280 | 512GB M.2 SSD, NVMe, Opal, GEN4x4, TLC,2280 | 256GB M.2 SSD, NVMe, Opal, GEN4x4, TLC,2280 | 1024GB NVMe M.2 SSD TLC |
|------------------------------------|--|--|---|---|-------------------------|
| Dimensions Millimeters (W x D x H) | X | X | X | X | 22 x 80 x 2.3 |
| Interface Type | X | X | X | X | PCIe Gen 3 x4 NVMe |
| Power Active (AVG) | X | X | X | X | 5W |
| Power Idle | X | X | X | X | 50mW |
| Typical Sequential Read | X | X | X | X | 3200MB/s |
| Typical Sequential Write | X | X | X | X | 1600MB/s |
| Operating Temperature Range | X | X | X | X | 0 to 55°C |
| Endurance Rating (Lifetime Writes) | X | X | X | X | 300TB |
| Mean Time Between Failures (MTBF) | X | X | X | X | 2.0M POH |
| Hardware Encryption | X | X | X | X | AES 256-bit |

Solid State Storage Specifications

| Drive | 512GB NVMe M.2 SSD TLC | 256GB NVMe M.2 SSD TLC |
|------------------------------------|------------------------|------------------------|
| Dimensions Millimeters (W x D x H) | 22 x 80 x 2.3 | 22 x 80 x 2.3 |
| Interface Type | PCIe Gen 3 x4 NVMe | PCIe Gen 3 x4 NVMe |
| Power Active (AVG) | 5W | 5W |

| | | |
|------------------------------------|-------------|-------------|
| Power Idle | 50mW | 50mW |
| Typical Sequential Read | 3200MB/s | 3000MB/s |
| Typical Sequential Write | 1600MB/s | 1300MB/s |
| Typical Random Read (4GB Span) | 340K IOPS | 205K IOPS |
| Typical Random Write (4GB Span) | 275K IOPS. | 260K IOPS. |
| Operating Temperature Range | 0 to 55°C | 0 to 55°C |
| Endurance Rating (Lifetime Writes) | 150TB | 85TB |
| Mean Time Between Failures (MTBF) | 2.0M POH | 2.0M POH |
| Hardware Encryption | AES 256-bit | AES 256-bit |

HDD Controllers

| | |
|---------------------|---|
| PCI Bus | PCIe Gen4 |
| PCI Modes | RAID, AHCI |
| RAID Levels | 0, 1, 5, 10, Volume and RAIDable |
| Data Transfer Rates | AMD RAIDXpert2 (OS) RAID and PD operations in BIOS |
| PCI Card Type | SATA 6Gbs NVMe 16Gbs |
| PCI Voltage | Onboard AMD controller (Bixby) |
| Disclaimers | SATA, M.2 NVMe |

Optical Drive Specifications

| | | | |
|----------------|---------------------|------------------------------------|--|
| Description | DVD-ROM, 9.0mm Slim | DVD Burner/CD-RW Rambo, 9.0mm Slim | Blu Ray Burner w/AACS encryption, 9.0 slim |
| Interface Type | SATA | SATA | SATA |

Discrete Graphics Adapter

| | | | | | |
|-------------------|--------------|--------------|--------------|-------------------------------|-------------------------------|
| Adapter | Quadro P620 | Quadro P1000 | Quadro P2200 | Quadro RTX 4000 | Quadro RTX 5000 |
| Bus Interface | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 3.0 x16 |
| Display Interface | 4 x mDP 1.4 | 4 x mDP 1.4 | 4 x DP 1.4 | 3 x DP 1.4 1 x VirtualLink | 4 x DP 1.4 1 x VirtualLink |
| Graphics Chipset | Pascal | Pascal | Pascal | Turing | Turing |

| | | | | | |
|---|---|---|---|---|---|
| Memory Clock Frequency (MHz) | 1252MHz | 1253MHz | 1251MHz | 1625MHz | 1750MHz |
| Memory Size | 2GB GDDR5 | 4GB GDDR5 | 5GB GDDR5X | 8GB GDDR6 | 16GB GDDR6 |
| Memory Interface | 128-bit | 128-bit | 160-bit | 256-bit | 256-bit |
| Memory Bandwidth | Up to 80GB/s | Up to 82GB/s | Up to 200GB/s | Up to 416GB/s | Up to 448GB/s |
| GPU Cores | CUDA Cores: 512 | CUDA Cores: 640 | CUDA Cores: 1280 | CUDA Cores: 2304 Tensor Cores: 288 RT Cores: 36 | CUDA Cores: 3072 Tensor Cores: 384 RT Cores: 48 |
| GPU Core Frequency (MHz) | 1266MHz | 1266MHz | 1000MHz | 1005MHz | 1620MHz |
| Maximum Power Consumption | 40W | 47W | 75W | Total board power: 160W Total graphics power: 125W | Total board power: 265W Total graphics power: 230W |
| Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital) | 4 x 4096x2160 @ 60Hz 4 x 5120x2880 @ 60Hz | 4 x 4096x2160 @ 60Hz 4 x 5120x2880 @ 60Hz | 4 x 4096x2160 @ 120Hz 4 x 5120x2880 @ 60Hz | 4 x 3840x2160 @ 120Hz 4 x 5120x2880 @ 60Hz 4 x 7680x4320 @ 60Hz | 4 x 4096x2160 @ 120Hz 4 x 5120x2880 @ 60Hz 2 x 7680x4320 @ 60Hz |
| Thermal Solution | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink |
| Dimension | 2.713" H x 5.7" L Single Slot, Low Profile | 2.713" H x 5.7" L Single Slot, Low Profile | 4.4" H x 7.9" L Single Slot | 4.4" H x 9.5" L Single Slot | 4.4" H x 10.5" L Dual Slot, Full Height |
| Advanced Display | Not Available | Not Available | Not Available | SYNC 2 | SYNC 2 |
| SLI/NVLink Support | Not Available | Not Available | Not Available | Not Available | NVLink |

Discrete Graphics Adapter

| | | | | | |
|------------------------------|-------------------------------|-------------------------------|--------------|-----------------------|-----------------------|
| Adapter | Quadro RTX 6000 | Quadro RTX 8000 | Quadro GV100 | AMD Radeon Pro WX3200 | AMD Radeon Pro W 5500 |
| Bus Interface | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 3.0 x16 | PCIe 4.0 x16 |
| Display Interface | 4 x DP 1.4 1 x VirtualLink | 4 x DP 1.4 1 x VirtualLink | 4 x DP 1.4 | 4 x mDP 1.4 | 4 x DP 1.4 |
| Graphics Chipset | Turing | Turing | Volta | Polaris | RDNA |
| Memory Clock Frequency (MHz) | 1750MHz | 1750MHz | 858MHz | X | X |
| Memory Size | 24GB GDDR6 | 48GB GDDR6 | 32GB HBM2 | 4GB GDDR5 | 8GB GDDR6 |

| | | | | | |
|---|---|---|---|--|--|
| Memory Interface | 384-bit | 384-bit | 4096-bit | 128-bit | 128-bit |
| Memory Bandwidth | Up to 672GB/s | Up to 672GB/s | Up to 870GB/s | 96GB/s | 224 GB/s |
| GPU Cores | CUDA Cores: 4608 Tensor Cores: 576 RT Cores: 72 | CUDA Cores: 4608 Tensor Cores: 576 RT Cores: 72 | CUDA Cores: 5120 Tensor Cores: 640 | 640 | 1408 |
| GPU Core Frequency (MHz) | 1440MHz | 1395MHz | 1132MHz | X | X |
| Maximum Power Consumption | Total board power: 295W Total graphics power: 260W | Total board power: 295W Total graphics power: 260W | 250W | 50W | 125W |
| Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital) | 4 x 4096x2160 @ 120Hz 4 x 5120x2880 @ 60Hz 2 x 7680x4320 @ 60Hz | 4 x 3840 x 2160 @ 120Hz 4 x 5120x2880 @ 60Hz 2 x 7680x4320 @ 60Hz | 4 x 4096x2160 @ 120Hz 4 x 5120x2880 @ 60Hz 2 x 7680x4320 @ 60Hz | 4 x 1920x1080 @ 60Hz 4 x 3840x2160 @ 60Hz 2 x 5120x2880 @ 60Hz 1 x 7680x4320 @ 60Hz | 4 x 1920x1080 @ 60Hz 4 x 3840x2160 @ 60Hz 2 x 5120x2880 @ 60Hz 2 x 7680x4320 @ 60Hz |
| Thermal Solution | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink | Ultra-quiet Active Fansink | X | X |
| Dimension | 4.4" H x 10.5" L Dual Slot, Full Height | 4.4" H x 10.5" L Dual Slot, Full Height | 4.4" H x 10.5" L Dual Slot, Full Height | 2.7" H x 6.6" L Single Slot, Half Height | 4.4" H x 9.5" L Single Slot, Full Height |
| Advanced Display | SYNC 2 | SYNC 2 | Not Available | Not Available | Not Available |
| SLI/NVLink Support | NVLink | NVLink | NVLink | Not Available | Not Available |

Discrete Graphics Adapter

| | |
|---------------------------|-----------------------|
| Adapter | AMD Radeon Pro W 5700 |
| Bus Interface | PCIe 4.0 x16 |
| Display Interface | 5 x mDP 1.4 |
| Graphics Chipset | RDNA |
| Memory Size | 8GB GDDR6 |
| Memory Interface | 256-bit |
| Memory Bandwidth | 448 GB/s |
| GPU Cores | 2304 |
| Maximum Power Consumption | 205W |
| Supported Resolutions and | 6 x 1920x1080 @ 60Hz |

| | |
|---|--|
| Max Refresh Rates (Hz) (Note: Analog and/or Digital) | 6 x 3840x2160 @ 60Hz 3 x 5120x2880 @ 60Hz 3 x 7680x4320 @ 60Hz |
| Dimension | 4.4" H x 10.5" L Double Slot, Full Height |
| Advanced Display | Not Available |
| SLI/NVLink Support | Not Available |

Ethernet

| | | |
|---|---|---|
| Model | Marvell AQC-107 (Onboard LOM) | AQN-107 Optional PCIe AIC |
| Description | Five speed 10GBASE-T LAN on Motherboard NIC | Five speed 10GBASE-T LAN on Motherboard NIC |
| Connector | RJ-45 Copper | RJ-45 Copper |
| Controller Bus Architecture | PCIe Gen3 x4 | PCIe Gen3 x4 |
| Data Transfer Mode | Ethernet | Ethernet |
| Website | https://www.marvell.com/products/ethernet-adapters-and-controllers/aqion-ethernet-controllers.html | https://www.marvell.com/products/ethernet-adapters-and-controllers/aqion-ethernet-adapters.html |
| DMTF DASH | Supported | Not Supported |
| Data Rates Supported | 100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps | 100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps |
| 5GBASE-T (IEEE 802.3 specification conformance) | Supported | Supported |
| 2.5GBASE-T (IEEE 802.3 specification conformance) | Supported | Supported |
| 10GBASE-T (IEEE 802.3 specification conformance) | Supported | Supported |
| 100BASE-TX (IEEE 802.3 specification conformance) | Supported | Supported |
| 1000BASE-T (IEEE 802.3 specification conformance) | Supported | Supported |
| Auto-Negotiation | Supported | Supported |
| Power Optimizer Platform Low-power Management Systems | N/A | N/A |
| MACsec IEEE 802.1 AE | Supported | Supported |
| Energy Efficient Ethernet | Supported | Supported |
| TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6) | Supported | Supported |
| Receive Side Scaling | Supported | Supported |
| Dual Tx and Rx Queues | Supported | Supported |
| Quality of Service (QoS) and Data Center Bridging (DCB) | Up to 8 QoS traffic classes | Up to 8 QoS traffic classes |
| Jumbo Frames (up to 9KB) | Supported (Up to 16KB) | Supported, Up to 9KB frames |
| Teaming | No | Yes(?) |

| | | |
|--|---|---|
| Integrated Auto Connect Battery Saver (ACBS) Battery Savings | N/A | N/A |
| Timing and Synchronization | IEEE 1588 Ver1 & Ver2 (AVB) NTP Ver3 & Ver4 SNTP Ver4 | IEEE 1588 Ver1 & Ver2 (AVB) NTP Ver3 & Ver4 SNTP Ver4 |
| Integrated Switched Voltage Regulator (iSVR) | N/A | N/A |
| NC Sideband Interface | SMBus | SMBus |
| Shared Flash with System BIOS | No | No |
| Wake from Deep Sx | Supported | Supported |
| Wake on LAN (Magic Packet, PING, Pattern) | Supported | Supported |
| Operating System Support | Win10 and Linux 8 | Win10 and Linux 8 |
| Manageability Capabilities Alerting | ASF 1.0 and 2.0 | ASF 1.0 and 2.0 |
| Network Proxy/ARP Support | Supported | Supported |
| TDP | 108C | 108C |
| Temperature Operating range | 0-55C w/ no air flow | 0-55C w/ no air flow |
| Power Consumption | 6W @ 10Gbs 4W @5Gbs | 6W @ 10Gbs 4W @5Gbs |
| IEEE Standards Compliance | IEEE 802.3bz - NBASE-T IEEE 802.3x - Flow Control IEEE 802.1P - Quality of Service IEEE 802.1QAV - AVB | IEEE 802.3bz - NBASE-T IEEE 802.3x - Flow Control IEEE 802.1P - Quality of Service IEEE 802.1QAV - AVB |
| Boot ROM Support | UEFI (Unified Extensible Firmware Interface) 2.3/2.5 PXE (Preboot Execution Environment) 2.0 | UEFI (Unified Extensible Firmware Interface) 2.3/2.5 PXE (Preboot Execution Environment) 2.1 |

Media Card Reader

| | |
|----------------|-----------------------------------|
| Description | 15-in-1 USB 3.0 Media Card Reader |
| Interface Type | Integrated into Front Panel |
| Form Factor | SD UHS-II, Compact Flash, SM |

SECTION IV: BIOS / Certifications / Standards / Environmental

BIOS Specifications

| | |
|--|--|
| WMI Support | Compliant With Microsoft WBEM and the DMTF Common Information Model |
| ROM-Based Setup Utility (F1) | System Configuration Setup Program (text only interface) Available at Power-on With F1 Key |
| Bootblock Recovery | Recovers System BIOS if the Flash ROM Becomes Corrupted |
| Replicated Setup | Saves System Configuration Settings to a File That Can Then be Used to Replicate the Settings to Other Systems |
| Boot Control | Boot Control Available Through ROM-based Setup Utility or With F12 Key at Power-on |
| Memory Change Alert | Power-on Error Message in the Event of a Decrease in System Memory |
| Thermal Alert | Power-on Error message in the Event of a Fan Failure |
| Asset Tag | Supports Ability to Set SMBIOS Type 2 Baseboard Asset Tag Field |
| System/Emergency ROM Flash Recovery with Video | Supports Process to Recover the System BIOS if the Flash ROM Becomes Corrupted |
| Remote Wakeup/Remote Shutdown | System Admin Can Power On/Off a Client Computer from a Remote Location to Provide Maintenance |
| Quick Resume Time | Supports Low Power S3 (suspend to RAM) and Prompt Resume Times |
| ROM Revision Level | System UEFI (BIOS) Version Reported in SMBIOS Type 0 Structure and in BIOS Setup |
| Keyboard-less Operation | System Can be Booted Without a Keyboard |
| Per-port Control | Allows I/O Ports to be Individually Enabled/Disabled Through ROM-based Setup or WMI Interface |
| Adaptive Cooling | Offers Multiple Settings for Fan Control Ranging Between Better Performance and Better Acoustics |
| Security | User and Administrator Passwords Can Protect Boot and ROM-based Setup <ul style="list-style-type: none"> - Support Electronic Lock - Chassis Intrusion Detection - UEFI Secure Boot Support - HDD Password Can Protect HDD Data - Windows UEFI Firmware Update Support - Device Guard Support - Optional Access Panel Lock, Kensington Lock, and Pad Lock |
| Memory Modes | Supports Mirroring, Lock Step, and Sparing Memory Modes |
| Windows 10 Ready | Supports Windows 10 Requirements for Secure Flash, UEFI v 2.6 Device Guard Support Spec |

Industry Standard Specification Support

| | |
|--|--|
| UEFI | Unified Extensible Firmware Interface v2.7 |
| ACPI (Advanced Configuration and power Management Interface) | Advanced Configuration and Power Interface v6.1 |
| ASF 2.0 | DMTF Alert Standard Format Specification v2.0 |
| ATA (IDE) | AT Attachment 6 with Packet Interface (ATA/ATAPI-6) |
| CD Boot | EI Torito Bootable CD-Rom Format Specification, v1.0 |

| | |
|-------------|--|
| EHCI | Enhanced Host Controller Interface for Universal Serial Bus, Revision v1.0 |
| PCI | NA (No PCI slot) |
| PCI Express | PCI Express Base Specification v3.0 |
| SATA | Serial ATA Revision 3.0 Specification |
| TPM | Trusted Computing Group TPM Specification v2.0 |
| UHCI | Universal Host Controller Interface Design Guide, Revision v1.1 |
| USB | Universal Serial Bus Revision v1.1 Universal Serial Bus v2.0 Universal Serial Bus v3.0 |
| SMBIOS | DMTF System Management Spec v3.2.1 |
| XHCI | XHCI SPEC Revision v1.2 |

Social and Environmental Responsibility

| | |
|--|---|
| Quality Control | Lenovo is a member of an eco declaration system that enforces regular independent quality control |
| Hazardous Substances and Preparation | <ul style="list-style-type: none"> • Products do not contain more than; 0.1% lead, 0.01% cadmium, 0.1% mercury, 0.1% hexavalent chromium, 0.1% polybrominated biphenyls (PBB) or 0.1% polybrominated diphenyl ethers (PBDE). (See legal reference and Note B1) • Products do not contain Asbestos • Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide • Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation • Products do not contain more than 0.1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP • Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm²/week REACH Article 33 information about substances in articles is available at: http://www.lenovo.com/social_responsibility/us/en/ThinkGreen_products.html#environment |
| Batteries | Not Available |
| Safety, EMC Connection to the Telephone Network and Labeling | Not Applicable, no Connection to a Telephone Network |

Safety, EMC Connection to the Telephone Network and Labeling

| | |
|-------------------------|--|
| System Software Manager | Lenovo ThinkStation Supports Software Management Tools by Lenovo Vantage |
|-------------------------|--|

Regulations & Standards

| | |
|--------------|---|
| EMC & Safety | FCC DoC for North America VCCI Certification for Japan BSMI Certification for Taiwan EU/EFTA CE Mark & DoC UL/CUL UL-GS IEC60950-1 CB Report/Certificate Saudi Arabia SASO Kuwait KUCAS China CCC Mark Hong Kong SAR (CB report) Singapore PSB South Africa SABS Russia-EAC Morocco-CM Mexico-NOM Kazakhstan-EAC Belarus-EAC Serbia KVALITET Ukraine UKrCEPRO India-BIS USA Chemical Emission Test |
|--------------|---|

Environmentals

| | |
|----------------------|--|
| Energy Star | ENERGY STAR® v8.0 |
| EPEAT | EPEAT Certification Available on Select Models |
| ErP Lot-3 2013 | Yes |
| Hazardous Substances | <ul style="list-style-type: none"> • Products do not contain more than; 0.1% lead, 0.01% cadmium, 0.1% mercury, 0.1% hexavalent chromium, 0.1% polybrominated biphenyls (PBB) or 0.1% polybrominated diphenol ethers (PBDE) • Products do not contain Asbestos • Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide • Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation • Products do not contain more than 0.1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP • Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm₂/week |