Lenovo P5 Gen 2

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Product Name	P5 Gen 2
Product Display Name	ThinkStation P5 Gen 2
Information Date	7-May-26
Hardware Maintenance Manual	TBD
Drivers & Software	TBD
Available Whitepapers	TBD

SECTION I: Platform Overview

Description	Engineered for ultimate versatility, the ThinkStation P5 Gen 2 is the all-around industry workhorse for professionals that demand scalable, future-proof solutions in mission-critical environments.

CPU

Processor Support	Intel Granite Rapids Mainstream Workstation Processor
Socket Type	Socket-E2 (LGA-4710)
Disclaimers	

Operating Systems

Preloaded	Windows 11 Pro for Workstations Ubuntu 24.04 LTS (configuration specific)
Supported	Ubuntu 24.04 LTS Red Hat Enterprise Linux 10.2
Disclaimers	

Memory

Slots	8
Channels	4
Type	PC5-6400 ECC RDIMM
ECC Support	Yes
Speed	Up to 6400 MT/s (1 DIMM per channel)[1] Up to 5200 MT/s (2 DIMMs per channel)[1]
Max DIMM Size	128GB DDR5 ECC RDIMM
Max System Memory	1TB
Disclaimers	[1]Memory speed is dependent on the CPU and number of DIMMs per channel being utilized.

Storage

Total Bays/Size	2 x Standard SATA HDD Bays1 2 x Optional via ThinkStation Enterprise Dual Drive Internal Enclosure (EDDIE) 1 x Optional via 3.5" SATA HDD Bay
SATA	4 x SATA 3.0 (6 Gb/s) Connectors
PCIe (M.2)	2 x M.2 NVMe 2280/221102 PCIe 5.0 x4 Connectors Onboard 2 x Optional via M.2 NVMe 2280 PCIe 5.0 x4 Front Access Drive Bay 4 x Optional via ThinkStation PCIe 5.0 x16 Quad M.2 SSD Adapter (Medina Gen 5)3
Disclaimers	Note: See Storage Whitepaper for details on the available usage options. [1]One dual-drop SATA power cable and one single SATA data cable are shell fit. [2]There are no certified 22110 M.2 NVMe drives at this time. [3]The Medina Gen 5 Adapter supports multiple M.2 drive sizes, but only 2280 M.2 drives are officially supported at this time.

Video

Integrated Graphics	Not Available
Discrete Graphics	Nvidia RTX Pro 6000 Blackwell Max-Q Workstation Edition (DP x4) – 96GB, GDDR7, PCIe 5.0, Dual-Slot (300W) Nvidia RTX Pro 5000 Blackwell (DP 2.1 x4) – 72GB, GDDR7, PCIe 5.0, Dual-Slot (300W) Nvidia RTX Pro 5000 Blackwell (DP 2.1 x4) – 48GB, GDDR7, PCIe 5.0, Dual-Slot (300W) Nvidia RTX Pro 4500 Blackwell (DP 2.1 x4) – 32GB, GDDR7, PCIe 5.0, Dual-Slot (200W) Nvidia RTX Pro 4000 Blackwell (DP 2.1 x4) – 24GB, GDDR7, PCIe 5.0, Single-Slot (140W) Nvidia RTX Pro 2000 Blackwell (MiniDP 2.1 x4) – 16GB, GDDR7, PCIe 5.0, Dual-Slot (70W) Nvidia RTX A1000 (MiniDP 1.4a x4) – 8GB, GDDR6, PCIe 4.0, Single-Slot (50W)

	Nvidia RTX A400 (MiniDP 1.4a x4) – 4GB, GDDR6, PCIe 4.0, Single-Slot (50W)
Multi-GPU Support	Yes
Type	PCIe Add-In-Card
Bus Interface	PCIe x16
Disclaimers	

Slots

Slot 1	PCIe 5.0 x16, Full Height, Full Length, 75W, CPU
Slot 2	PCIe 4.0 x4, Full Height, Full Length, 25W, Open Ended, PCH
Slot 3	PCIe 5.0 x16, Full Height, Full Length, 75W, CPU
Slot 4	PCIe 4.0 x4, Full Height, Full Length, 25W, Open Ended, CPU
Slot 5	PCIe 5.0 x8, Full Height, Full Length, 25W, Open Ended, CPU
Slot 6	PCIe 4.0 x4, Full Height, Full Length, 25W, Open Ended, PCH
Disclaimers	

Front I/O

USB	Optional: Front Panel I/O Ports: 1 x USB-A 3.2 Gen 2×1 (10Gbps), 4.5W 1 x USB-A 3.2 Gen 2×1 (10Gbps), 10.5W supports BC1.2 2 x USB-C 3.2 Gen 2×1 (10Gbps), 15W per port
Audio	1 x Headphone / Microphone Combo Jack (3.5mm)
Media Card Reader	Optional:15-in-1 Media Card Reader[1]
Flex Bay	Optional: Front access dual M.2 drive enclosure[1]
Disclaimers	Note: Actual USB throughout will vary depending on the type and quantity of USB devices used. 1Only one optional Media Card Reader or Front access dual M.2 drive enclosure supported.

Rear I/O

USB	2 x USB-A 2.0 (480Mbps), 2.5W per port 2 x USB-A 3.2 Gen 2×1, (10Gbps), 4.5W per port 1 x USB-C 3.2 Gen 2×2 (20Gbps), 15W 1 x USB-C 3.2 Gen 2×1 (10Gbps), 15W 1 x USB-A 3.2 Gen 2×1, (10Gbps), 15W (internal)
Audio	2 x 3.5mm Jacks (Line Out, Line In retasked as Mic)
Serial Port	Optional: 1 x Serial (via cable) Optional: 4 x Serial (via 4-port serial expansion

	card, PCIe x1)
Ethernet	1 x Intel Foxville I226-LM – 2.5 Gigabit Ethernet – RJ45
PS/2	Optional: ThinkStation Dual PS/2 Port PCIe x1 Adapter
Optional USB Adapter	ThinkStation USB4 Dual Port PCIe 4.0 x4 Adapter
Optional Network Adapter	Realtek RTL8125BGS Single Port 2.5Gigabit PCIe 2.1 x1 Ethernet Adapter Intel I210-T1 Single Port Gigabit PCIe 2.1 x1 Ethernet Adapter Intel I350-T4 Quad Port Gigabit PCIe 2.1 x4 Ethernet Adapter Intel E610-T4 Quad Port 10Gigabit PCIe 4.0 x8 Ethernet Adapter Intel E810-XXVDA2 Dual Port 25Gigabit PCIe 4.0 x8 Ethernet Adapter[1] Intel Wi-Fi 7 BE200, 802.11be 2×2 Wi-Fi + Bluetooth 5.4, Intel vPro Technology Support
Disclaimers	Note: Actual USB throughout will vary depending on the type and quantity of USB devices used. Note: Network speeds listed are theoretical. [1]The Intel E810-XXVDA2 requires 2 x SFP28 transceivers.

Ethernet

Vendor	Intel Foxville I226-LM – 2.5 Gigabit Ethernet Controller (vPro, AMT)
Speeds	10/100/1000/2500 Mbps
Functions	PXE, WOL, Jumbo Frames
Connectors	1 x RJ45
Disclaimers	Note: Network speeds listed are theoretical.

Audio

Vendor	Realtek
Type	High Definition (HD) Audio
Internal Speaker	1 x 1.5 watt 4 ohm
Connectors	2 x Rear 3.5mm Jacks (Line Out, Line In can retasked as Mic) 1 x Front 3.5mm Global Headset Jack (Headphone + Mic in)
Chipset	Realtek ALC897Q on MB (rear)[1] Realtek ALC4032 on FPIO (front)
Number of Channels	Rear Audio: 2 Channels Front Audio: 2 Channels
Number of Bits/Audio Resolution	Rear Codec: 10 Channel DAC Supports 16/20/24-bit PCM 2 Stereo ADC Supports 16/20/24-bit PCM Front Codec: One stereo DAC supports 8/16/22.05/24/32/44.1/48/96/176.4/192KHz Sample

	Rate, 16/24-bit One stereo ADC supports 8/16/22.05/24/32/44.1/48/96KHz Sample Rate, 16/24-bit
Disclaimers	[1]Audio Codec ALC897Q can support 7.1 channel, but motherboard only has 2 rear jacks – MIC in and Line out, only 2 channel for Line out.

Thermal

Temp Sensors	Ambient Cabled Sensor – Thermistor, Motherboard Header cabled to chassis front bezel PCIe Zone 1 Sensor – Thermistor PCIe Zone 2 Sensor – Thermistor PCIe Zone 3 Sensor – Thermistor M.2 Zone 1 Sensor – Thermistor Vcore Thermal Sensor 1 – Thermistor Vcore Thermal Sensor 2 – Thermistor
Fans	1 x Front Fan – 4-pin header with 4-pin key 1 x Storage Bay Fan – 4-pin header with 4-pin key 1 x Rear Fan – 4-pin header with 4-pin key 1 x CPU Fan – 4-pin header with 3-pin key 1 x Flex Bay Fan – 4-pin header with 4-pin key 2 x Memory Fans – 4-pin header with 3-pin key PSU Fans – provided by PSU vendor

Power Specifications

Power Supply	750W	1000W
Power Efficiency	92% Efficient @ 50% Load	92% Efficient @ 50% Load
Main	C14 socket to std C13 line cord	C14 socket to std C13 line cord
Operating Voltage Range	100 – 240V (autosensing)	100 – 240V (autosensing)
Rated Voltage Range	90-264VAC	90-264VAC
Rated Line Frequency	47Hz / 63Hz	47Hz / 63Hz
Operating Line Frequency Range	50Hz / 60Hz	50Hz / 60Hz
Rated Input Current	10A	12A
Graphics	1 x 8-pin (6+2) PCIe1	Up to 4 x 8-pin (6+2) PCIe1 or 2 x 16-pin (12VHPWR) PCIe1
Power Supply Fan	Yes	Yes
ENERGY STAR® Qualified (config dependent)	Yes	Yes
80 PLUS Compliant	Yes	Yes
Built-in Self Test (BIST) LED	Yes	Yes
Aux Power Drop	Yes	Yes
Disclaimers	Note: See Power Configuration Whitepaper for additional details. [1]Quantity of Graphics power	Note: See Power Configuration Whitepaper for additional details. [1]Quantity of Graphics power

	cables are configuration dependent	cables are configuration dependent

BIOS

Vendor	AMI
Disclaimers	

Chassis Information

Color	Storm Gray
PSU	750W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified 1000W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified
Thermal Solutions	1 x Front Fan 1 x Storage Bay Fan 1 x Rear Fan 1 x CPU Fan 1 x Flex Bay Fan 2 x Memory Fans PSU Fans – provided by PSU vendor
Dimensions	440mm/17.3" H (with feet) 453.9mm/17.9" D 165mm/6.5" W
Weight	19kg /41.9lbs (maximum configuration)
Disclaimers	

Packaging Dimensions

Height (mm/in)	600mm / 23.62"
Width (mm/in)	295mm / 11.61"
Depth (mm)	571mm / 22.48"
Weight (kgs/lbs)	21.5kg /47.4lbs
Disclaimers	

Security & Serviceability

TPM	Infineon SLB9672 (TPM 2.0, SPI, CC, and FIPS 140-2 certified) FW15.23 or latest Co-layout with NSING TCM NS350 IC
Asset ID	Yes, 1024 x 8bit
vPro	Yes
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	Yes, Optional Key Lock for Side Panel (Common or Random)
Boot Sequence Control	Yes
Padlock Support	Yes
Boot Without Keyboard and/or Mouse	Yes
Access Panel	Tool-less Side Cover Removal
Hard Drives	Tool-less
Expansion Cards	Tool-less
Processor Socket	Tool-less1
Color Coded User Touch Points	Yes
Color-coordinated Cables and Connectors	Yes
Memory	Tool-less
System Board	Retained with Phillips Head Screws
Restore CD/DVD/USB Set	Not Included, Recovery Media available via Lenovo Download Recovery Service or Lenovo Support.
Disclaimers	[1]CPU Heatsink assembly requires a T30 bit.

Operating Environment

Air Temperature	Operating Temperature: 10°C to 35°C (50°F to 95°F)
Storage	Storage Temperature (in original shipping carton): -40°C to 60°C (-40°F to 140°F) Storage Temperature (without carton): -10°C to 60°C (14°F to 140°F)
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	Upper limits decrease 1°C (1.8°F) per 300 m (1000 ft) above sea level
Vibration	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	Operating: X,Y axis: +- 15G/3ms Z axis: +- 30G/3ms Operating (Rack mounted): X,Y,Z axis: +- 15G/3ms Non-operating target: Trapezoidal shock, 35g average, 11ms

Disclaimers	Note: Extended operating temperatures are possible – please contact your Lenovo Rep.

SECTION II: Platform Detail

Board Size	11.3" x 10" (287.02mm x 254mm)
Layout	Lenovo Custom Extended eATX MB
Disclaimers	

Motherboard Core

Processor Support	Intel Granite Rapids Workstation Processor
Socket Type	Socket-E2 (LGA 4710)
Memory Support	PC5-6400 ECC RDIMM
Voltage Regulator	Intel VR14.0 – 300W TDP Capable
Chipset (PCH)	Intel Arrow Lake S (ARL-S) W890 PCH
Flash	2 x 64Mb (soldered)
Super I/O	One MEC1743
Clock	Intel External Clock design
Audio	Rear Codec: HDA ALC897Q on MB (Rear I/O) Front Codec: USB2.0 ALC4032 (FPIO)
Ethernet	Intel 2.5Gb Foxville Base-T MAC/PHY I226-LM/V (vPro, AMT)
Disclaimers	

Supported Components

Processor Level	Intel Xeon 600 Series Processors
Processor	Intel Xeon 678X 300W 128L 48C 96T 192MB 2.4GHz DDR5 Intel Xeon 676X 275W 128L 32C 64T 144MB 2.8GHz DDR5 Intel Xeon 674X 270W 128L 28C 56T 144MB 3.0GHz DDR5 Intel Xeon 658X 250W 128L 24C 48T 144MB 3.0GHz DDR5 Intel Xeon 656 210W 128L 20C 40T 72MB 2.9GHz DDR5 Intel Xeon 654 200W 128L 18C 36T 72MB 3.1GHz DDR5 Intel Xeon 638 180W 80L 16C 32T 72MB 3.2GHz DDR5 Intel Xeon 636 170W 80L 12C 24T 48MB 3.5GHz DDR5

	Intel Xeon 634 150W 80L 12C 24T 48MB 2.7GHz DDR5
Memory Type	PC5-6400 ECC RDIMM
Memory	16GB DDR5 ECC RDIMM PC5-6400 MT/s 32GB DDR5 ECC RDIMM PC5-6400 MT/s 64GB DDR5 ECC RDIMM PC5-6400 MT/s 128GB DDR5 ECC RDIMM PC5-6400 MT/s
Disclaimers	Note: Lenovo does not support CPU overclocking on ThinkStation platforms.

Storage

3.5" SATA Hard Disk Drive (HDD)	2TB SATA – 5400rpm, 6Gb/s, 3.5" 2TB SATA – 7200rpm, 6Gb/s, 3.5" 4TB SATA – 7200rpm, 6GB/s, Enterprise, 3.5" 10TB SATA – 7200rpm, 6Gb/s, Enterprise, 3.5" 12TB SATA – 7200rpm, 6Gb/s, Enterprise, 3.5"
2.5" SAS Hard Disk Drive (HDD)	
2.5" SATA Hard Disk Drive (HDD)	
2.5" SATA Solid State Drive (SSD)	
M.2 PCIe Solid State Drive (SSD)	512GB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0 1TB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0 2TB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0 4TB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0
U.2 PCIe Solid State Drive (SSD)	
PCIe Add-in-Card Solid State Drive (SSD)	
Intel Optane Storage Technology	
Disclaimers	Note: Additional Storage Devices Certified.

RAID

RAID Requirements	NVMe RAID via VROC Controller SATA RAID via Intel RSTe Optional: SATA RAID via RAID 940-8i RAID Controller
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.
Optional Hard Disk Drive Controllers	Optional: RAID 940-8i RAID controller – supports 0/1/5
Intel VROC	Standard: Onboard Intel RSTe SATA RAID – supports 0/1/5/10 Optional: Intel Virtual RAID On CPU (VROC) – Basic, Supports 0/1/10

	Optional: Intel Virtual RAID On CPU (VROC) – Premium, Supports 0/1/5/10

Optical Drive/Removable Media

Media Card Reader Specifications	Optional: 15-in-1 Media Card Reader Support SD slot 1.Secure Digital Card (SD) Mini SD (requires adapter) Micro SD (requires adapter) 2.Secure Digital High Capacity (SDHC) Mini SD High Capacity (requires adapter) Micro SD High Capacity (requires adapter) 3.SD Extended Capacity Memory Card (SDXC) Micro SD Extended Capacity (requires adapter) 4.SD Ultra High Speed II (SD UHSII) 5.MultiMediaCard(MMC) RS-MMC (requires adapter) MMC-Micro (requires adapter) CF slot 6.CompactFlash Type I 7.CompactFlash Type II 8.Microdrive MS slot 9.Memory Stick Memory Stick Micro (requires adapter) 10.Memory Stick Duo 11.Memory Stick PRO 12.Memory Stick PRO Duo 13.Memory Stick PRO-HG Duo Memory Stick HG Micro (requires adapter) 14.Memory Stick XC Duo Memory Stick XC Micro (requires adapter) 15.Memory Stick XC-HG Duo Memory Stick XC-HG Micro (requires adapter)
Disclaimers	

Keyboard and Pointing Devices

Keyboard	USB Calliope AI Keyboard USB Traditional AI Keyboard USB Smart Card AI Keyboard
Pointing Devices	USB Calliope Mouse
Disclaimers	

Expansion Bays

5.25" External Access Bays	Optional: Front access dual M.2 drive bay or Optional:15-in-1 Media Card Reader
Disclaimers	Note: Only one optional device supported.

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PCIe Adapters

Network	Realtek RTL8125BGS Single Port 2.5Gigabit PCIe 2.1 x1 Ethernet Adapter Intel I210-T1 Single Port Gigabit PCIe 2.1 x1 Ethernet Adapter Intel I350-T4 Quad Port Gigabit PCIe 2.1 x4 Ethernet Adapter Intel E610-T4 Quad Port 10Gigabit PCIe 4.0 x8 Ethernet Adapter Intel E810-XXVDA2 Dual Port 25Gigabit PCIe 4.0 x8 Ethernet Adapter1
USB	ThinkStation USB4 Dual Port PCIe 4.0 x4 Adapter
WiFi Cards	Intel Wi-Fi 7 BE200, 802.11be 2×2 Wi-Fi + Bluetooth 5.4, Intel vPro Technology Support
PS/2	ThinkStation Dual PS/2 Port PCIe 3.0 x1 Adapter
Com port	Serial COM port cable with 5V transceiver 4-Port Serial Expansion Card PCIe 3.0 x1 Adapter
PCIe to M.2 Adapter Card	ThinkStation PCIe 5.0 x16 Quad M.2 SSD Adapter (Medina Gen 5)
Other	ThinkStation BMC PCIe 8.0 x4 Adapter
Disclaimers	Note: Actual USB throughout will vary depending on the type and quantity of USB devices used. Note: Network speeds listed are theoretical. 1The Intel E810-XXVDA2 requires 2 x SFP28 transceivers.

SECTION III: Supported Component Detail

CPU Specifications Group 1

CPU	Intel Xeon 678X 300W 128L 48C 96T 192MB 2.4GHz DDR5	Intel Xeon 676X 275W 128L 32C 64T 144MB 2.8GHz DDR5	Intel Xeon 674X 270W 128L 28C 56T 144MB 3.0GHz DDR5	Intel Xeon 658X 250W 128L 24C 48T 144MB 3.0GHz DDR5	Intel Xeon 656 210W 128L 20C 40T 72MB 2.9GHz DDR5
# of Cores	48	32	28	24	20
# of Threads	96	64	56	48	40
Processor Base Frequency	2.4 GHz	2.8 GHz	3.0 GHz	3.0 GHz	2.9 GHz
Max Turbo Frequency	4.9 GHz	4.9 GHz	4.9 GHz	4.9 GHz	4.8 GHz
Cache	192 MB	144 MB	144 MB	144 MB	72 MB
TDP	300 W	275 W	270 W	250 W	210 W
Intel ARK Spec Link	Intel® Xeon® 678X	Intel® Xeon® 676X	Intel® Xeon® 674X	Intel® Xeon® 658X	Intel® Xeon® 656
Disclaimers					

CPU Specifications				

Group 2				
CPU	Intel Xeon 654 200W 128L 18C 36T 72MB 3.1GHz DDR5	Intel Xeon 638 180W 80L 16C 32T 72MB 3.2GHz DDR5	Intel Xeon 636 170W 80L 12C 24T 48MB 3.5GHz DDR5	Intel Xeon 634 150W 80L 12C 24T 48MB 2.7GHz DDR5
# of Cores	18	16	12	12
# of Threads	36	32	24	24
Processor Base Frequency	3.1 GHz	3.2 GHz	3.5 GHz	2.7 GHz
Max Turbo Frequency	4.8 GHz	4.8 GHz	4.7 GHz	4.6 GHz
Cache	72 MB	72 MB	48 MB	48 MB
TDP	200 W	180 W	170 W	150 W
Intel ARK Spec Link	Intel® Xeon® 654	Intel® Xeon® 638	Intel® Xeon® 636	Intel® Xeon® 634
Disclaimers				

HDD Specifications

Drive	2TB SATA – 5400rpm, 6Gb/s, 3.5"	2TB SATA – 7200rpm, 6Gb/s, 3.5"	4TB SATA – 7200rpm, 6Gb/s, 3.5" Enterprise	10TB SATA – 7200rpm, 6Gb/s, 3.5" Enterprise	12TB SATA – 7200 RPM 6Gb/s 3.5" Enterprise
3.5" SATA Hard Disk Drive (HDD)	Coming Soon	Yes	Yes	Yes	Yes
Connector	Coming Soon	SATA	SATA	SATA	SATA
Transfer Rate (Gb/sec)	Coming Soon	Average Data Rate, Read/Write 156MB/s	Sustained Data Transfer Rate 216-226MB/s	TBD	Max Sustained Data Transfer Rate 268MB/s
Spindle Speed (RPM)	Coming Soon	7,200	7,200	TBD	7,200
Power Off to Spindle Stop (sec)	Coming Soon	NA	NA	TBD	NA
DC Power to Drive Ready (sec)	Coming Soon	<20.0	<30.0	TBD	<30.0
Average Latency (msec)	Coming Soon	4.16	4.16	TBD	4.16
Input (VDC)	Coming Soon	5 & 12	5 & 12	TBD	5 & 12
Typical (Watts)	Coming Soon	6.8Max	9.5(Max)	TBD	8(Max)
Idle (Watts)	Coming Soon	3.9Max	5.2(Max)	TBD	5.3(Max)
Physical Dimensions	Coming Soon	101.6mm x 147mm x 26.1mm	101.85mm x 147mm x 26.1mm	TBD	101.85mm x 147mm x 26.1mm
Weight (grams)	Coming Soon	<495	<715	TBD	<715

Operating (C) Ambient	Coming Soon	0 to 55	5 to 55	TBD	5 to 55
Operating (C) Base Casting	Coming Soon	<60	<60	TBD	<60
Non-Operating (C) Ambient	Coming Soon	(-40 to 70)	(-40 to 70)	TBD	(-40 to 70)
Gradient (C per Hour)	Coming Soon	20	20	TBD	20
Operating (Gs @ 2ms)	Coming Soon	80(Read/Write)	Read 70 / Write 40	TBD	50 (Read/Write)
Non-Operating (Gs @ 2ms)	Coming Soon	350	250	TBD	250
Disclaimers			*Some parameters may vary depending on the actual configuration.		

Solid State Storage Specifications Group 1

Drive	512GB M.2 PCIe – SSD, 2280, Gen5Px4, NVMe, TLC, OPAL2.0	1TB M.2 PCIe – SSD, 2280, Gen5Px4, NVMe, TLC, OPAL2.0	2TB M.2 PCIe – SSD, 2280, Gen5Px4, NVMe, TLC, OPAL2.0	4TB M.2 PCIe – SSD, 2280, Gen5Px4, NVMe, TLC, OPAL2.0
Dimensions Millimeters (W x D x H)	22mm x 80mm x 2.38mm	22mm x 80mm x 2.38mm	22mm x 80mm x 2.38mm	22mm x 80mm x 2.38mm
Interface Type	PCIe Gen5	PCIe Gen5	PCIe Gen5	PCIe Gen5
Power Active (AVG)	7.5W Read/5.7W Write	8.3W Read/7.9W Write	8.6W Read/8.5W Write	8.6W Read/8.5W Write
Power Idle	50mW	50mW	50mW	50mW
Typical Sequential Read	11000 MB/s	14000 MB/s	14000 MB/s	14000 MB/s
Typical Sequential Write	5500 MB/s	11000 MB/s	12000 MB/s	12000 MB/s
Operating Temperature Range	0C to 70C	0C to 70C	0C to 70C	0C to 70C
Endurance Rating (Lifetime Writes)	200 TBW	400 TBW	800 TBW	1600 TBW
Mean Time Between Failures (MTBF)	2.0 million hours	2.0 million hours	2.0 million hours	2.0 million hours
Hardware Encryption	OPAL	OPAL	OPAL	OPAL
Disclaimers		SSD performance measured with Crystal Disk Mark version 6.0.2 with the default 1000 MB data set. Sequential measurements are with 1 Thread, Queue-Depth 32. Random measurements are with 4 threads and queue-depth 32.		
HDD Controllers				
Disclaimers				
Optical Drive Specifications				

Relative Humidity	
Maximum Wet Bulb Temperature	
Disclaimers	
Integrated Graphics Adapter	

Disclaimers				

Discrete Graphics Adapter Group 1

Adapter	NVIDIA RTX A400	NVIDIA RTX A1000	NVIDIA RTX PRO 2000 Blackwell	NVIDIA RTX PRO 4000 Blackwell	NVIDIA RTX Pro 4500 Blackwell
Bus Interface	PCIe 4.0 x8	PCIe 4.0 x8	PCIe 5.0 x 8	PCIe 5.0 x16	PCIe 5.0 x16
Display Interface	4x mDP 1.4a	4x mDP 1.4a	4x DP 2.1b	4x DP 2.1b	4x DP 2.1b
Graphics Chipset	GA107 (Ampere)	GA107 (Ampere)	GB206 (Blackwell)	GB203 (Blackwell)	GB203 (Blackwell)
Memory Clock Frequency (MHz)	1500 MHz	1500 MHz	1125 MHz	1750 MHz	1750 MHz
Memory Size	4 GB GDDR6 with ECC	8 GB GDDR6 with ECC	16 GB GDDR7 with ECC	24 GB GDDR7 with ECC	32 GB GDDR7 with ECC
Memory Interface	64-bit	128-bit	128-bit	192-bit	256-bit
Memory Bandwidth	96 GB/s	192 GB/s	288 GB/s	672 GB/s	896 GB/s
GPU Cores	CUDA Cores: 768 Tensor Cores: 24 RT Cores: 6	CUDA Cores: 2,304 Tensor Cores: 72 RT Cores: 18	CUDA Cores: 4.352 Tensor Cores: 136 RT Cores: 34	CUDA Cores: 8,960 Tensor Cores: 280 RT Cores: 70	CUDA Cores: 10,496 Tensor Cores: 328 RT Cores: 82
GPU Core Frequency (MHz)	1762 MHz	1462 MHz	1957 MHz	2055 MHz	2407 MHz
Maximum Power Consumption	50 W	50 W	70 W	140 W	200 W
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz	4x 4096 x 2160 @ 120Hz 4x 5120 x 2880 @ 60Hz 2x 7680 x 4320 @ 30Hz	4x 3840 x 2160 @ 165 Hz 2x 3840 x 2160 @ 360 Hz 2x 7680 x 4320 @ 100 Hz	4x 3840 x 2160 @ 165 Hz 2x 7680 x 4320 @ 100 Hz	4x 3840 x 2160 @ 165 Hz 2x 7680 x 4320 @ 100 Hz
Thermal Solution	Active	Active	Active	Active	Active
Dimension	2.7” H x 6.4” L, single slot	2.7” H x 6.4” L, single slot	2.7” H x 6.6” L, dual slot	4.4” H x 9.5” L, single slot, full height	4.4” H x 10.5” L, dual slot, full height
Advanced Display	NA	NA	NA	RTX PRO Sync	RTX PRO Sync

SLI/NVLink Support	NA	NA	NA	NA	NA
Disclaimers					

Discrete Graphics Adapter Group 2

Adapter	NVIDIA RTX Pro 5000 Blackwell	NVIDIA RTX PRO 6000 Blackwell Max-Q Workstation Edition	AMD Radeon PRO W6400
Bus Interface	PCIe 5.0 x16	PCIe 5.0 x16	PCIe 4.0 x4
Display Interface	4x DP 2.1b	4x DP 2.1b	2x DP 1.4a
Graphics Chipset	GB202 (Blackwell)	GB202 (Blackwell)	RDNA 2.0
Memory Clock Frequency (MHz)	1750 MHz	1750 MHz	2000 MHz
Memory Size	48 GB GDDR7 with ECC	96 GB GDDR7 with ECC	4 GB GDDR6
Memory Interface	384-bit	512-bit	64-bit
Memory Bandwidth	1344 GB/s	1792 GB/s	128 GB/s
GPU Cores	CUDA Cores: 14,080 Tensor Cores: 440 RT Cores: 110	CUDA Cores: 24,064 Tensor Cores: 752 RT Cores: 188	Stream Processors: 768 RT Cores: 12
GPU Core Frequency (MHz)	2377 MHz	2280 MHz	2321 MHz
Maximum Power Consumption	300 W	300 W	50 W
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	4x 3840 x 2160 @ 165 Hz 2x 7680 x 4320 @ 100 Hz	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz	2x 3840×2160 2x 5120×2880 1x 7680×4320
Thermal Solution	Active	Active	Active
Dimension	4.4” H x 10.5” L, dual slot, full height	4.4” H x 10.5” L, dual slot, full height	6.6”L, single slot, half height
Advanced Display	RTX PRO Sync	RTX PRO Sync	NA
SLI/NVLink Support	NA	NA	NA
Disclaimers			

Ethernet Specifications Group 1 Part 1

Card	RTL8125BGS 2.5G PCIe Ethernet Adapter	Intel® I210-T1 Single Port Gigabit Ethernet Adapter	Intel® I350-T4 Quad Port Gigabit Ethernet Adapter	ThinkSystem Intel® E610-T4 10GBASE-T 4-port PCIe Ethernet Adapter	Intel® E810-XXVDA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter
Supplier PN	RTL8125BGS-CG	I210T1, MM# 941033	I350T4G1P20, MM# 928942	Coming Soon	Coming Soon
Data Rates Supported	10/100/1000/2500Mbps	10/100/1000Mbps copper	10/100/1000Mbps (Copper),	Coming Soon	Coming Soon

	copper		1000Mbps (Fiber)		
Controller Details	Ethernet Controller RTL8125B	Intel® Ethernet Controller I210	Intel Ethernet Controller I351	Coming Soon	Coming Soon
Controller Bus Architecture	PCIe 2.1 (5GT/s)	PCIe 2.1 (5GT/s)	PCIe 2.1 (5GT/s)	Coming Soon	Coming Soon
Data Transfer Mode	Ethernet	Ethernet	Ethernet	Coming Soon	Coming Soon
Power Consumption	0.8W	0.81W	Copper: I350T4V2= 5W LC-Fiber: I350F4= 6W	Coming Soon	Coming Soon
IEEE Standards Compliance	IEEE 802.3 10BASE-Te 100/1000/2.5G BASE-T	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T	Coming Soon	Coming Soon
Boot ROM Support	PXE /UEFI Boot	PXE boot, Intel iSCSI Remote Boot for Windows, Linux and Vmware, Intel BootAgent Software via PXE or BootP, WDMS or UEFI	PXE boot, Intel iSCSI Remote Boot for Windows, Linux and Vmware, Intel BootAgent Software via PXE or BootP, WDMS or UEFI	Coming Soon	Coming Soon
Network Transfer Mode (Full/Half Duplex)	Supported	Supported	Supported	Coming Soon	Coming Soon
Network Transfer Rate	2500Mbps Full Duplex	1,000Mbps Full Duplex	1,000Mbps Full Duplex	Coming Soon	Coming Soon
Operating System Driver Support	Windows 11 64	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Coming Soon	Coming Soon
Manageability	Supported	Supported	Coming Soon	Coming Soon	
Manageability Capabilities Alerting	Supported	Supported	Coming Soon	Coming Soon	
Lithography		Coming Soon		Coming Soon	
TDP	Thermal Management	Firmware Based Thermal Management	Firmware Based Thermal Management	Coming Soon	Coming Soon
Operating Temperature Range	-5℃-50℃ (23°F to 122°F)	0°C to 55°C (32°F to 131°F)	0°C to 55°C (32°F to 131°F)	Coming Soon	Coming Soon
# of Ports	1	1	4	Coming Soon	Coming Soon
Data Rate Per Port	10/100/1000/2500Mbps	10/100/1000Mbps (copper)	10/100/1000Mbps (copper), 1000Mbps (fiber)	Coming Soon	Coming Soon
System Interface Type	PCIe Gen 2.1	PCIe Gen 2.1	PCIe Gen 2.1	Coming Soon	Coming Soon
NC Sideband	Not Available	Not Available	Not Available	Coming Soon	Coming Soon

Interface					
Jumbo Frames Supported	Yes	Yes	Yes	Coming Soon	Coming Soon
1000Base-T	Yes	Yes	Yes	Coming Soon	Coming Soon
MACsec IEEE 802.1 AE	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
IEEE 1588	Supported	Supported	Supported	Coming Soon	Coming Soon
Supported Under vPro	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
Disclaimers					

Ethernet Specifications Group 1 Part 2

Model	RTL8125BGS 2.5G PCIe Ethernet Adapter	Intel® I210-T1 Single Port Gigabit Ethernet Adapter	Intel I350-T4 Quad Port Gigabit Ethernet Adapter	ThinkSystem Intel® E610-T4 10GBASE-T 4-port PCIe Ethernet Adapter	Intel® E810-XXVDA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter
Connector	RJPA54-5JE3-M1A-0R	RJ-45 Copper	4 x Ports RJ-45 Copper	Coming Soon	Coming Soon
Website	RTL8125BGS	i210 T1	i350 T4	Coming Soon	Coming Soon
Auto-Negotiation	Supported	IEEE* 802.3* Auto-negotiaton	IEEE* 802.3* Auto-negotiaton	Coming Soon	Coming Soon
Intel® vPro™	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
Intel® Standard Manageablity	Not Available	Supported	Supported	Coming Soon	Coming Soon
Power Optimizer Platform Low-power Management Systems	Not Available	Supported	Supported	Coming Soon	Coming Soon
Energy Efficient Ethernet	Supported	Supported	Supported	Coming Soon	Coming Soon
TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6)	Supported	Supported	Supported	Coming Soon	Coming Soon
Receive Side Scaling	Supported	Supported	Supported	Coming Soon	Coming Soon
Dual Tx and Rx Queues	Yes	Yes	Yes	Coming Soon	Coming Soon
Jumbo Frames (up to 9KB)	Jumbo Frames (up to 16KB)	Supported	Supported	Coming Soon	Coming Soon
Teaming	Supported	Supported	Supported	Coming Soon	Coming Soon
Integrated Switched	Supported	Supported	Not Available	Coming Soon	Coming Soon

Voltage Regulator (iSVR)					
Shared Flash with System BIOS	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
Wake from Deep Sx	Supported	Supported	Supported	Coming Soon	Coming Soon
Server Operating System Support	TBD	Windows Server 2008, 2012, 2016. 2019 Linux (RHEL/SLES), Free BSD, Xen, Vmware	Windows Server 2008, 2012, 2016. 2019 Linux (RHEL/SLES), Free BSD, Xen, Vmware	Coming Soon	Coming Soon
Network Proxy/ARP Support	Supported	Supported	Supported	Coming Soon	Coming Soon
Disclaimers					

Media Card Reader

Description	UHS-II 15-in-1 USB3.0 MCR
Interface Type	USB 3.0
Form Factor	USB 3.0 Mass Storage Device
Disclaimers	

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 and GUI 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 – Chassis Intrusion Detection – UEFI Secure Boot Support – HDD Password Can Protect HDD Data – Windows UEFI Firmware Update Support – Device Guard Support
Intel(R) AMT (includes ASF 2.0)	Allows System to be Supported from a Remote Location
Intel(R) TXT	Provides a Security Foundation to Build Protections Against Software Based Attacks
Memory Modes	Supports Mirroring, Lock Step, and Sparing Memory Modes
Windows 10 Ready	TBD

Industry Standard Specification Support

UEFI	Unified Extensible Firmware Interface v2.9
ACPI (Advanced Configuration and Power management Interface)	Advanced Configuration and Power Interface v6.5
ASF 2.0	DMTF Alert Standard Format Specification v2.0
ATA (IDE)	NA
CD Boot	NA
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision v1.0
PCI	NA (No PCI slot)
PCI Express	PCI Express Base Specification v5.0
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 v3.7
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	· 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), hydrochlorofluorcarbons (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/cm_/week”
Batteries	Not Available
Safety, EMC Connection to the Telephone Network and Labeling	Not Applicable, no Connection to a Telephone Network

Acoustic Noise Emissions Declaration

LWAd(bels) Idle	Coming Soon
LWAd(bels) Oper	Coming Soon

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	Coming Soon

Environmentals

Energy Star	ENERGY STAR® v9.0
EPEAT	EPEAT1.0 GOLD
Greenguard	Greenguard
RoHS	RoHS Compliant
ErP Lot-3 2013	Yes
Hazardous Substances	· 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), hydrochlorofluorcarbons (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/cm_/week”
TCO Certification	TCO 10
Disclaimers	EPEAT registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country.