Lenovo P8

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Product Name

Product Display Name	ThinkStation P8
Information Date	20-Aug-24
Hardware Maintenance Manual	P8 HMM
Drivers & Software	P8 Drivers & Software
Available Whitepapers	P8 Whitepapers

SECTION I: Platform Overview

Description	The bold Lenovo ThinkStation P8 is a force to be reckoned with and brings together breakthrough compute architecture with an optimized thermal design in a versatile, Aston Martin inspired chassis. The ThinkStation P8 is the leading AMD Ryzen™ Threadripper™ PRO 7000 WX-Series processor powered workstation delivering game-changing power and speed with the largest core count professional workstation up to 96 cores and up to 5.3GHz. Perfect for those who demand more power for multi-threaded applications and intense (high demand) workloads with professional manageability and enterprise-class services & support.

CPU

Processor Support	AMD Storm Peak Workstation Processor (Ryzen Threadripper PRO)
Socket Type	TR5/SP6
Disclaimers	Threadripper Pro CPUs support AMD vendor lock.

Operating Systems

Preloaded	Windows 11 Pro 64-bit for Workstation Ubuntu 22.04 LTS (configuration specific)
Supported	Red Hat Enterprise Linux 9.3 Ubuntu 22.04 LTS
Disclaimers	

Memory

Slots	Up to 8 DIMMs
Channels	8 Memory Channels
Type	DDR5, 288-Pin, ECC RDIMM and 3DS RDIMM
ECC Support	Yes
Speed	Up to 5200MT/s*
Max DIMM Size	64GB DDR5 ECC RDIMM 128GB DDR5 ECC 3DS-RDIMM
Max System Memory	1TB**
Disclaimers	*Actual Memory Speed is dependent on system configuration. **Configuration dependent, supported through special bids.

Storage

Total Bays/Size	3 (2 std, 1 optional)

SATA	3x SATA 3.0 Connectors
Onboard M.2	3x M.2 NVMe 2280/22110 PCIe Connectors Onboard (Gen5)
Front Access Storage Bay	1x M.2 NVMe 2280 PCIe in Flex access tray
Bay 1 Capability	Any one of the following (must match Bay 2): 3.5" SATA Drive Dual M.2 NVMe 2280/22110 Adapter* 15mm U.3 PCIe SSD 2.5" (Gen4)*
Bay 2 Capability	Any one of the following (must match Bay 1): 3.5" SATA Drive Dual M.2 NVMe 2280/22110 Adapter* 15mm U.3 PCIe SSD 2.5" (Gen4)*
Bay 3 (Optional) Capability	3.5" SATA Drive**
PCIe (M.2)	
Disclaimers	Note: Bays 1 and 2 must use the same type of storage *Requires additional parts. **Bay 3 inclusion dependent on system configuration. See Storage Whitepaper for details on the available usage options.

Video

Integrated Graphics	Not Available
Discrete Graphics	Nvidia T400(3x MiniDP) – 4GB GDDR6 Nvidia T1000(4x MiniDP) – 8GB GDDR6 Nvidia RTX A2000 (4x MiniDP) – 12GB GDDR6 Nvidia RTX A4000 (4x DP) – 16GB GDDR6 Nvidia RTX A6000(4x DP) – 48GB GDDR6 Nvidia RTX 2000 Ada (4x MiniDP) – 16GB GDDR6 Nvidia RTX 4000 Ada (4x DP) – 20GB GDDR6 Nvidia RTX 4500 Ada (4x DP) – 24GB GDDR6 Nvidia RTX 5000 Ada(4x DP) – 32GB GDDR6 Nvidia RTX 5880 Ada(4x DP) – 48GB GDDR6 Nvidia RTX 6000 Ada (4x DP) – 48GB GDDR6 2 x NVIDIA RTX A6000 with NVLink Nvidia RTX A400(4x MiniDP) – 4GB GDDR6 Nvidia RTX A1000(4x MiniDP) – 8GB GDDR6 NVIDIA Quadro SYNC II card AMD Radeon PRO W6400 (2x DP), 4GB GDDR6 AMD Radeon PRO W7600 (4x DP), 8GB GDDR6 AMD Radeon PRO W7900 (3x DP,1x MiniDP), 48GB GDDR6
Multi-GPU Support	Yes

Type	PCIe Add-In-Card
Bus Interface	PCIe x16

Slots

Slot 1	PCIe 5.0 x16, Full Height, Full Length, 75W
Slot 2	PCIe 5.0 x8, Full Height, Full Length, 25W, Open Ended
Slot 3	PCIe 5.0 x16, Full Height, Full Length, 75W
Slot 4	PCIe 5.0 x8, Full Height, Full Length, 25W, Open Ended
Slot 5	PCIe 5.0 x16, Full Height, Full Length, 75W
Slot 6	PCIe 5.0 x16, Full Height, Full Length, 75W
Slot 7	PCIe 4.0 x8, Full Height, Half Length, 25W, Open Ended
Disclaimers	

Front I/O

USB	2x USB-C 3.2 Gen 2 (10Gbps)* 2x USB-A 3.2 Gen 2 (10Gbps)*
Audio	1x 3.5mm Combo Headphone Jack (Headphone + Mic in)
Media Card Reader	USB 3.0 15-in-1 Media card reader supporting SD UHS-II (Optional)
Flex Bay	1x Front access drive bay Supports either M.2 or 15-in-1 Media Card Reader
Disclaimers	*Basic front IO panel (excludes 2x USB-C and 2x USB-A ports) is supported Note: Actual USB throughput will vary depending on the type and quantity of USB devices used.

Rear I/O

USB	1x USB-C 3.2 Gen 2×2 (20Gbps) 3x USB-A 3.2 Gen 2 (10Gbps) 2x USB-A 2.0 (480Mbps)
Audio	2x 3.5mm Jacks (Line out, Line-in retasked as Mic)
DisplayPort	As Supported by GPU
HDMI	As Supported by GPU
DVI	
VirtualLink	
VGA Port	
Serial Port	Optional Serial COM port, via cable
Ethernet	1 x 1GbE – RJ45 with DASH 1 x 10GbE – RJ45
PS/2	Optional PS/2 (2 port) PCIe adapter
IEEE 1394	
Alternative Rear Power Button	Yes
Parallel Port	
Optional USB Adapter	
Optional Network Adapter	Intel I350-T2 Dual Port Gigabit PCIe Ethernet Adapter Intel I350-T4 Quad Port Gigabit PCIe Ethernet Adapter Broadcom 5720 Dual Port Gigabit PCIe Ethernet Adapter Broadcom 5719 Quad Port Gigabit PCIe Ethernet Adapter Intel X550-T2 Dual Port 10-Gigabit PCIe Ethernet Adapter RZ616 WIFI6e PCIe M.2 2230 Module with Internal Antennas NVIDIA ConnectX-6 25G 2-Ports Adapter
Disclaimers	Note: Actual USB throughout will vary depending on the type and quantity of USB devices used.

Ethernet

Vendor	Aquantia 10 GbE AQC113-B1-C Realtek 1 GbE RTL8111EPP (DASH capable)

Speeds	10/100/1000/10000Mbps Aquantia AQC113-B1-C 10/100/1000Mbps Realtek RTL8111EPP
Functions	PXE, WOL, Jumbo Frames ASF
Connectors	2 x RJ45
Disclaimers	Note: Network speeds listed are theoretical.

Audio

Vendor	Realtek
Type	HD (2.0)
Internal Speaker	1 x 1.5 watt 4 ohm
Connectors	2x Rear 3.5mm Jacks (Line Out, Line In retasked as Mic) 1x Front 3.5mm Global Headset Jack (Headphone + Mic in)
Chipset	Realtek ALC897Q-VA2-CG Codec (rear) Realtek ALC4032 (front)
Number of Channels	Rear Audio: 2 Channels Front Audio: 2 Channels
Disclaimers	Note: 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, MB Header cabled to chassis front bezel PCIe Zone 1 Sensor – Thermistor PCIe Zone 2 Sensor – Thermistor PCIe Zone 3 Sensor – Thermistor DIMM Right Sensor – Thermistor located at rear of DIMM bank DIMM Left Sensor – Thermistor located at rear of DIMM bank Storage (M.2) Sensor1 – Thermistor located between M.2 Slot 1 and Slot 2 Storage (M.2) Sensor2 – Thermistor located near M.2 Slot 3
Fans	Dual Fan CPU heatsink 1x Fan for PCIe slots 1-4 2x Front CPU Fan (configuration dependent)

	1x Front Flex Bay Fan (configuration dependent) 1x Fan for PCIe slots 5-7 1x HDD Fan (configuration dependent) 1x Rear Fan 2x PSU Fan (inside PSU) 2x Memory Duct Fan
Disclaimers	

Power Specifications

Power Supply	1000W / 1400W
Power Efficiency	92% Efficient @ 50% Load
Main	C14 socket to std C13 line cord
Operating Voltage Range	100 – 240V (autosensing)
Rated Voltage Range	90-264VAC
Rated Line Frequency	47Hz / 63Hz
Operating Line Frequency Range	50Hz / 60Hz
Rated Input Current	1000W: 6A-12A 1400W: 9A-15A
Graphics Power	Up to 3x 12VHPWR*
Power Supply Fan	Yes
ENERGY STAR® Qualified (config dependent)	Yes
80 PLUS Compliant	Yes
Built-in Self Test (BIST) LED	Yes
Disclaimers	Note: Power Output of 1400W PSU Limited to 1125W for 100-111.9 Input Voltage. *Quantity of Graphics power cables is configuration dependent *See Power Configuration Whitepaper for additional details.

BIOS

Vendor	AMI

Disclaimers	

Chassis Information

Color	Storm Gray
PSU	One Fixed 1400W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified or One Fixed 1000W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified
Thermal Solutions	Dual Fan CPU heatsink 1x Fan for PCIe slots 1-4 2x Front CPU Fan (configuration dependent) 1x Front Flex Bay Fan (configuration dependent) 1x Fan for PCIe slots 5-7 1x HDD Fan (configuration dependent) 1x Rear Fan 2x PSU Fan (inside PSU) 2x Memory Duct Fan
Dimensions	435mm / 17.1" H 175mm / 6.9" W 508mm / 20" D
Weight	22.7 kg / 50.0 lbs (max config)
Disclaimers	

Packaging Dimensions

Height (mm/in)	618mm / 24.23"
Width (mm/in)	324mm / 12.8"
Depth (mm/in)	695mm / 27.4"
Weight (kgs/lbs)	25.9 kg / 57.1 lbs (max config)
Disclaimers	

Security & Serviceability

TPM	Infineon SPI TPM SLB9672VU2.0 TPM 2.0
Asset ID	Yes, 1024 x 8bit
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
Boot Sequence Control	Yes
Padlock Support	No
Boot Without Keyboard and/or Mouse	Yes
Access Panel	Tool-less Side Cover Removal
Optical Drive	No
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 Download Recovery Service or available through Lenovo Support.
Disclaimers	*CPU Heatsink assembly and force frame require a T20 bit.

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	Upper limits decrease 1°C (1.8°F) per 300 m (1000 ft) above sea level
Vibration	Operating: Random 5~500Hz 0.27Grms, 30minutes 3 axes (X,Y,Z) Non-Operating: Random 2~200Hz 1.04Grms, 15minutes 6 faces (±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	Extended operating temperatures are possible – please contact your Lenovo Rep

SECTION II: Platform Detail

Board Size	15" x 11.57" (381mm x 293.8mm)
Layout	Lenovo Custom Extended eATX
Disclaimers	

Motherboard Core

Processor Support	AMD Storm Peak Workstation Processor
Socket Type	Socket TR5/SP6
Memory Support	DDR5 up to 5200MT/s RDIMM / 3DS RDIMM Memory
CPU-CPU Interconnect	

Voltage Regulator	SVI3 VR Controller – 350W TDP Capable
Chipset (PCH)	AMD 600 Series Chipset Workstation Segment, Pro class version
Flash	2 x 64MB
Super I/O	1x Microchip MEC1723N-L0P-I/LJ (WFBGA-176pin)
Clock	External Clock
Audio	Rear Codec: Realtek ALC897Q-VA2-CG on Motherboard by Rear I/O Front Codec: Realtek ALC4032 on FPIO
Ethernet	Aquantia 10Gb AQC113-B1-C Realtek 1Gb RTL8111EPP with DASH
SAS	
Disclaimers	

Supported Components

Processor Level	AMD Stormpeak Workstation Processor
Processor	AMD Threadripper Pro 7995WX AMD Threadripper Pro 7985WX AMD Threadripper Pro 7975WX AMD Threadripper Pro 7965WX AMD Threadripper Pro 7955WX AMD Threadripper Pro 7945WX
Memory Type	RDIMM – 5600MT/s RDIMM / 3DS-RDIMM – 4800MT/s
Memory	16GB DDR5 ECC RDIMM PC5-5600 32GB DDR5 ECC RDIMM PC5-5600 64GB DDR5 ECC RDIMM PC5-5600 16GB DDR5 ECC RDIMM PC5-4800 32GB DDR5 ECC RDIMM PC5-4800 64GB DDR5 ECC RDIMM PC5-4800 128GB DDR5 ECC 3DS-RDIMM PC5-4800
Disclaimers	Note: Support for 8 x 128GB 3DS-RDIMMs is configuration dependant, supported through special bids.

Storage

3.5" SATA Hard Disk Drive (HDD)	2TB SATA – 7200rpm, 6Gb/s, 3.5" 6TB SATA – 7200rpm, 6Gb/s, 3.5" (Enterprise Class) 12TB SATA – 7200rpm, 6Gb/s, 3.5" (Enterprise Class)
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, Gen4 (x4), NVMe, TLC, OPAL2.0 1TB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0 2TB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0 4TB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0
U.2/U.3 PCIe Solid State Drive (SSD)	15.3TB U.3 PCIe – SSD, 15mm, Gen4 (x4), NVMe, 2.5" OPAL2.0
PCIe Add-in-Card Solid State Drive (SSD)	
Intel Optane Storage Technology	
Disclaimers	

RAID

RAID Capabilities	Onboard M.2 RAID via AMD CPU – supports up to RAID 0, 1, 5 Internal NVMe RAID via AMD CPU – supports up to RAID 0, 1, 5, 10* Internal NVMe RAID via Broadcom RAID Controller – supports up to RAID 0, 1, 5, 10* SATA RAID via Onboard AMD SATA Controller – supports up to RAID 0, 1, 5
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.
Optional Hard Disk Drive Controllers	
Intel VROC	
Disclaimers	*Additional hardware required Note: See Section 3 for details on supported Broadcom RAID Controller
Optical Drive/Removable Media	
DVD-ROM Drive	

DVD Burner/CD-RW Drive	
Blu-Ray Burner Drive	
Media Card Reader Specifications	
Disclaimers	

Keyboard and Pointing Devices

Keyboard	USB Traditional Keyboard PS/2 Traditional Keyboard Smart Card Keyboard USB Calliope Keyboard
Pointing Devices	USB Fingerprint Mouse USB Calliope Mouse PS/2 Black Optical Mouse
Disclaimers	

Expansion Bays

External Access Bays	Front access M.2 drive bay
Internal Expansion Bays	Optional internal 3.5" drive bay

PCIe Adapters

Network	Intel I350-T2 Dual Port Gigabit PCIe Ethernet Adapter Intel I350-T4 Quad Port Gigabit PCIe Ethernet Adapter Broadcom 5720 Dual Port Gigabit PCIe Ethernet Adapter Broadcom 5719 Quad Port Gigabit PCIe Ethernet Adapter Intel X550-T2 Dual Port 10-Gigabit PCIe Ethernet Adapter NVIDIA ConnectX-6 25G 2-Ports Adapter
Thunderbolt	
USB	
WiFi Cards	Mediatek PCIe WiFi6e Card With BT5 Internal Antenna Kit (RZ616)

PS/2	PS/2 (2-Port) PCIe adapter
Com port	Serial COM port cable with 5V transceiver
PCIe to NVMe Adapter Card	ThinkStation PCIe Gen4 Quad M.2 SSD Adapter
Other	BMC PCIe Adapter

SECTION III: Supported Component Detail

CPU Specifications Group 1

CPU	AMD Threadripper Pro 7945WX	AMD Threadripper Pro 7955WX	AMD Threadripper Pro 7965WX	AMD Threadripper Pro 7975WX	AMD Threadripper Pro 7985WX
# of Cores	12	16	24	32	64
# of Threads	24	32	48	64	128
Processor Base Frequency	4.7GHz	4.5GHz	4.2GHz	4.0GHz	3.2GHz
Max Turbo Frequency	5.3GHz	5.3GHz	5.3GHz	5.3GHz	5.1GHz
Cache	76MB	80MB L3	152MB	160MB L3	320MB
TDP	350W	350W	350W	350W	350W
AMD Spec Link	AMD Ryzen™ Threadripper™ PRO 7945WX	AMD Ryzen™ Threadripper™ PRO 7955WX	AMD Ryzen™ Threadripper™ PRO 7965WX	AMD Ryzen™ Threadripper™ PRO 7975WX	AMD Ryzen™ Threadripper™ PRO 7985WX
Disclaimers					

CPU Specifications Group 2

CPU	AMD Threadripper Pro 7995WX
# of Cores	96
# of Threads	192

Processor Base Frequency	2.5GHz
Max Turbo Frequency	5.1GHz
Cache	480MB
TDP	350W
AMD Spec Link	AMD Ryzen™ Threadripper™ PRO 7995WX
Disclaimers	

HDD Specifications

Drive	1TB SATA – 7200rpm, 6Gb/s, 3.5"	2TB SATA – 7200rpm, 6Gb/s, 3.5"	1TB SATA – 7200rpm, 6Gb/s, Enterprise, 3.5"	6TB SATA – 7200rpm, 6Gb/s, Enterprise, 3.5"	12TB SATA – 7200rpm, 6Gb/s, Enterprise, 3.5"
3.5" SATA Hard Disk Drive (HDD)	Yes	Yes	Yes	Yes	Coming Soon
2.5" SATA Hard Disk Drive (HDD)	Not Available	Not Available	Not Available	Not Available	Coming Soon
Connector	SATA	SATA	SATA	SATA	Coming Soon
Transfer Rate (Gb/sec)	Average data rate, read/write 156MB/s	Average data rate, read/write 156MB/s	Sustained data transfer rate 216 – 226MB/s	Sustained data transfer rate 216 – 226MB/s	Coming Soon
Spindle Speed (RPM)	7,200	7,200	7,200	7,200	Coming Soon
DC Power to Drive Ready (sec)	<10.0	<17.0	<17.0	<17.0	Coming Soon
Average Latency (msec)	4.16	4.16	4.16	4.16	Coming Soon
Input (VDC)	5	5	5	5	Coming Soon
Typical (Watts)	6.19	6.7	8.13	8.13	Coming Soon
Idle (Watts)	4.6	4.5	6.21	6.21	Coming Soon
Physical Dimensions	101.6mm x 146.99mm x 19.88mm	101.6mm x 146.99mm x 26.1mm	101.85mm x 147mm x 26.1mm	101.85mm x 147mm x 26.1mm	Coming Soon
Weight (grams)	420	535	705	705	Coming Soon
Operating (C) Ambient	0 to 60	0 to 60	5 to 60	5 to 60	Coming Soon

Operating (C) Base Casting	60	60	60	60	Coming Soon
Non-Operating (C) Ambient	(-40 to 70)	(-40 to 70)	(-40 to 70)	(-40 to 70)	Coming Soon
Gradient (C per Hour)	20	20	20	20	Coming Soon
Operating (Gs @ 2ms)	70	80	Read 70 Gs / Write 40 Gs	Read 70 Gs / Write 40 Gs	Coming Soon
Non-Operating (Gs @ 2ms)	350	300	250	250	Coming Soon
Disclaimers					

Solid State Storage Specifications

Drive	512GB M.2 PCIe – SSD, 2280, Gen4Px4, NVMe, TLC, OPAL2.0	1TB M.2 PCIe – SSD, 2280, Gen4Px4, NVMe, TLC, OPAL2.0	2TB M.2 PCIe – SSD, 2280, Gen4Px4, NVMe, TLC, OPAL2.0	4TB M.2 PCIe – SSD, 2280, Gen4Px4, NVMe, TLC, OPAL2.0
Dimensions Millimeters (W x D x H)	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Interface Type	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Power Active (AVG)	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Power Idle	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Typical Sequential Read	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Typical Sequential Write	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Operating Temperature Range	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Endurance Rating (Lifetime Writes)	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Mean Time Between Failures (MTBF)	Coming Soon	Coming Soon	Coming Soon	Coming Soon
Hardware Encryption	Coming Soon	Coming Soon	Coming Soon	Coming Soon
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

PCI Bus	PCH Integrated
PCI Modes	SATA 3.0
RAID Levels	0/1/5/10
Data Transfer Rates	6Gb/s
Internal Connectors	2 x MiniSAS HD (2 ports each) + 3 x SATA
Disclaimers	

Optical Drive Specifications

Operating Systems Supported	Windows 11 Pro High End DPK (Preload) Windows 11 Pro 64 DG to Windows 10 Pro 64 normal path special bid Windows 10 IOT Enterprise 64 2021 LTSC Ubuntu Linux V22.04 World Wide Multiple Language Custom Preload
Temperature	10° – 35°C (50° – 95°F)
Relative Humidity	10%-80% (non-condensing)
Maximum Wet Bulb Temperature	25°C max
Disclaimers	
Disclaimers	

Discrete Graphics Adapter Group 1

Adapter	T400	T1000	RTX A4000	RTX A6000	RTX 6000 Ada
Bus Interface	PCIe 3.0 x16	PCIe 3.0 x16	PCIe 4.0 x16	PCIe 4.0 x16	PCI Express 4.0×16
Display Interface	3 x mDP 1.4	4 x mDP 1.4	4 x DP 1.4a	4 x DP 1.4a	4 x DP 1.4a
Graphics Chipset	Turing	Turing	Ampere	Ampere	Ada Lovelace
Memory Clock Frequency (MHz)	Coming Soon	1250 MHz	1750 MHz	2000 MHz	2500 MHz
Memory Size	2GB GDDR6	4GB GDDR6	16GB GDDR6	48GB GDDR6	48GB GDDR6 ECC

Memory Interface	64-bit	128-bit	256-bit	384-bit	384-bit
Memory Bandwidth	80GB/s	160GB/s	448 GB/s	Up to 768GB/s	960 GB/s
GPU Cores	CUDA Cores: 384	CUDA Cores: 896	CUDA Cores: 6,144 Tensor Cores: 192 RT Cores: 48	CUDA Cores: 10,752 Tensor Cores: 336 RT Cores: 84	CUDA Cores: 18,176 Tensor Cores: 568 RT Cores: 142
GPU Core Frequency (MHz)	Coming Soon	1395MHz	1560MHz	1800MHz	2505MHz
Maximum Power Consumption	30W	50W	140W	300W	300W
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	Coming Soon	Coming Soon	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz
Thermal Solution	Active	Active	Active	Active	Active
Dimension	2.7" H x 6.1" L Single Slot	2.7" H x 6.1" L Single Slot	4.4" H x 9.5" L Single Slot	4.4" H x 10.5" L Dual Slot, Full Height	4.4" H x 10.5" L Dual Slot, Full Height
Advanced Display	Coming Soon	Coming Soon	SYNC 2	SYNC 2	Coming Soon
SLI/NVLink Support	Coming Soon	Coming Soon	Coming Soon	NVLink	No
Disclaimers					

Discrete Graphics Adapter Group 2

Adapter	Nvidia RTX 5000 Ada	Nvidia RTX 4500 Ada	Nvidia RTX 4000 Ada	AMD Radeon PRO W6400	AMD Radeon PRO W7600
Bus Interface	PCI Express 4.0×16	PCIe 4.0 x16	PCIe 4.0 x16	PCIe 4.0 x4	PCIe 4.0 x8
Display Interface	4 x DP 1.4a	4 x DP 1.4a	4 x DP 1.4a	2x DP 1.4a	4x DP 1.4a
Graphics Chipset	Ada Lovelace	Ada Lovelace	Ada Lovelace	RDNA 2.0	RDNA 3.0
Memory Clock Frequency (MHz)	2250 MHz	2250 MHz	1750 MHz	2000 MHz	2250MHz
Memory Size	32GB GDDR6 ECC	24GB GDDR6 ECC	20GB GDDR6 ECC	4GB GDDR6	8GB GDDR6
Memory Interface	256bit	192bit	160bit	64bit	128bit
Memory Bandwidth	576 GB/s	432GB/s	360 GB/s	128.0 GB/s	288.0 GB/s

GPU Cores	CUDA Cores: 12,800 Tensor Cores: 400 RT Cores: 100	CUDA Cores: 7,680 Tensor Cores: 240 RT Cores: 60	CUDA Cores: 6,144 Tensor Cores: 192 RT Cores: 48	Shading units: 768 RT Cores: 12	Coming Soon
GPU Core Frequency (MHz)	2550MHz	2580MHz	2175MHz	2321MHz	2440MHz
Maximum Power Consumption	250W	210W	130W	50W	130W
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz	4 x 4096×2160 @ 120Hz 4 x 5120×2880 @ 60Hz 2 x 7680×4320 @ 60Hz	Coming Soon	Coming Soon
Thermal Solution	Active	Active	Active	Coming Soon	Coming Soon
Dimension	4.4" H x 10.5" L Dual Slot	4.4" H x 10.5" L Dual Slot	4.4" H x 9.5" L SingleSlot	Coming Soon	4.5" H x 9.5" L SingleSlot
Advanced Display	Coming Soon	SYNC 2	Coming Soon	Coming Soon	Coming Soon
SLI/NVLink Support	No	No	No	Coming Soon	Coming Soon
Disclaimers					

Discrete Graphics Adapter Group 3

Adapter	AMD Radeon PRO W7900
Bus Interface	PCIe 4.0 x16
Display Interface	3x DP 2.1, 1x Mini DP2 .1
Graphics Chipset	RDNA 3.0
Memory Clock Frequency (MHz)	2250MHz
Memory Size	48GB GDDR6
Memory Interface	384bit
Memory Bandwidth	864.0 GB/S
GPU Cores	Coming Soon
GPU Core Frequency (MHz)	2495MHz
Maximum Power Consumption	295W

Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	Coming Soon
Thermal Solution	Coming Soon
Dimension	4.3" H x 11" L TripleSlot
Advanced Display	Coming Soon
SLI/NVLink Support	Coming Soon
Disclaimers	

Ethernet Specifications Group 1 Part 1

Card	Intel I350-T2 Dual Port Gigabit Ethernet Adapter (Stony Lake T2)	Intel I350-T4 Quad Port Gigabit Ethernet Adapter (Stony Lake T4)	Intel X550-T2 ethernet converged network adapter	Broadcom 5720 2-Ports Ethernet Adapter	Broadcom 5719 4-Ports Ethernet Adapter
Supplier PN	I350T2G1P20, MM# 928941	I350T4G1P20, MM# 928942	MM#928955	Coming Soon	Coming Soon
Data Rates Supported	10/100/1000Mbps (Copper), 1000Mbps (Fiber)	10/100/1000Mbps (Copper), 1000Mbps (Fiber)	100/1000Mbps and 10Gbps Copper	Coming Soon	Coming Soon
Controller Details	Intel Ethernet Controller I350	Intel Ethernet Controller I351	Intel Ethernet Controller X540	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	Copper: I350-T2 V2= 4.4W Fiber: I350-F2= 5.5W	Copper: I350T4V2= 5W LC-Fiber: I350F4= 6W	X540-T2: 10Gps= 17.4W 1Gbps= 9.5W 100Mbps=6.6W X540-T1: 10Gbps=10.8W 1Gbps= 7.7W 100Mbps= 6.4W	Coming Soon	Coming Soon
IEEE Standards Compliance	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T	IEEE 802.3 100/1000/10GBASE-T	Coming Soon	Coming Soon

Boot ROM Support	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	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	1,000Mbps Full Duplex	1,000Mbps Full Duplex	1,000Mbps Full Duplex	Coming Soon	Coming Soon
Operating System Driver Support	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Windows 7/8/10, Windows ServerLinux, FreeBSD	Coming Soon	Coming Soon
Manageability	Supported	Supported	Supported	Coming Soon	Coming Soon
Manageability Capabilities Alerting	Supported	Supported	Supported	Coming Soon	Coming Soon
TDP	Firmware Based Thermal Management	Firmware Based Thermal Management	Firmware Based Thermal Management	Coming Soon	Coming Soon
Operating Temperature Range	0°C to 55°C (32°F to 131°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	2	4	2	Coming Soon	Coming Soon
Data Rate Per Port	10/100/1000Mbps (copper), 1000Mbps (fiber)	10/100/1000Mbps (copper), 1000Mbps (fiber)	100/1,000Mbps, 10Gbps	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 Interface	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
Jumbo Frames Supported	Yes	Yes	Yes	Coming Soon	Coming Soon
1000Base-T	Yes	Yes	Yes	Coming Soon	Coming Soon
IEEE 1588	Supported	Supported	Not Available	Coming Soon	Coming Soon
Supported Under vPro	Not Available	Not Available	Not Available	Coming Soon	Coming Soon
Disclaimers					

Disclaimers	

Ethernet Specifications Group 2 Part 1

Card	NVIDIA ConnectX-6 25G 2-Ports Adapter	Intel I350-T2 Dual Port Gigabit Ethernet Adapter (Stony Lake T2)	Intel I350-T4 Quad Port Gigabit Ethernet Adapter (Stony Lake T4)
Supplier PN	Coming Soon	I350T2G1P20, MM# 928941	I350T4G1P20, MM# 928942
Data Rates Supported	Coming Soon	10/100/1000Mbps (Copper), 1000Mbps (Fiber)	10/100/1000Mbps (Copper), 1000Mbps (Fiber)
Controller Details	Coming Soon	Intel Ethernet Controller I350	Intel Ethernet Controller I351
Controller Bus Architecture	Coming Soon	PCIe 2.1 (5GT/s)	PCIe 2.1 (5GT/s)
Data Transfer Mode	Coming Soon	Ethernet	Ethernet
Power Consumption	Coming Soon	Copper: I350-T2 V2= 4.4W Fiber: I350-F2= 5.5W	Copper: I350T4V2= 5W LC-Fiber: I350F4= 6W
IEEE Standards Compliance	Coming Soon	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T	IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T
Boot ROM Support	Coming Soon	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
Network Transfer Mode (Full/Half Duplex)	Coming Soon	Supported	Supported
Network Transfer Rate	Coming Soon	1,000Mbps Full Duplex	1,000Mbps Full Duplex
Operating System Driver Support	Coming Soon	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Windows 7/8/10, Linux, Free BSD, XEN,Vmware
Manageability	Coming Soon	Supported	Supported
Manageability Capabilities Alerting	Coming Soon	Supported	Supported
TDP	Coming Soon	Firmware Based Thermal Management	Firmware Based Thermal Management
Operating Temperature Range	Coming Soon	0°C to 55°C (32°F to 131°F)	0°C to 55°C (32°F to 131°F)
# of Ports	Coming Soon	2	4

Data Rate Per Port	Coming Soon	10/100/1000Mbps (copper), 1000Mbps (fiber)	10/100/1000Mbps (copper), 1000Mbps (fiber)
System Interface Type	Coming Soon	PCIe Gen 2.1	PCIe Gen 2.1
NC Sideband Interface	Coming Soon	Not Available	Not Available
Jumbo Frames Supported	Coming Soon	Yes	Yes
1000Base-T	Coming Soon	Yes	Yes
IEEE 1588	Coming Soon	Supported	Supported
Supported Under vPro	Coming Soon	Not Available	Not Available
Disclaimers			
Disclaimers			
Description		9-in-1 (USB 2.0)	
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 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 – 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
Intel(R) AMT (includes ASF 2.0)	Allows System to be Supported from a Remote Location
Intel(R) TXT	Intel(R) Trusted Execution Technology Provides a Security Foundation to Build Protections Against Software Based Attacks
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	El 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	· 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), 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/cmÂ²/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(P920,P720,P520,P520c), cTUVus(P330) UL-GS(P920,P720,P520,P520c), TUV-GS(P330) 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® v7.0
EPEAT	EPEAT® Silver Certification Available on Select Models
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	9.0
Disclaimers	EPEAT registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country.