

# Lenovo PX

Version: 8.0 | 06/26/2025

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name                | PX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Product Display Name        | ThinkStation PX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Information Date            | 16-Jun-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Hardware Maintenance Manual | PX <a href="#">HMM</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Drivers & Software          | PX <a href="#">Drivers &amp; Software</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Available Whitepapers       | <a href="#">Power Configurator</a><br><a href="#">Memory Configurator</a><br><a href="#">Storage Configurator</a><br><a href="#">Intel vROC Configurator</a><br><a href="#">Discrete RAID Configurator</a><br><a href="#">Windows 11 Installation</a><br><a href="#">Windows 10 Installation</a><br><a href="#">Red Hat Enterprise Linux 9 Installation</a><br><a href="#">Ubuntu Linux 22.04 LTS Installation</a><br><a href="#">BMC Installation Guide</a><br><a href="#">Intel AMT</a><br><a href="#">ThinkStation WiFi Solutions</a> |

## SECTION I: Platform Overview

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The pinnacle of Lenovo technology, the ThinkStation PX goes beyond the limits of desktop performance to enable even the most extreme workflows. Featuring a thermally advanced chassis co-designed with Aston Martin, the latest dual 4th Gen Intel Xeon Scalable processors, up to 120 cores, and support for up to four NVIDIA RTX6000 Ada Generation GPUs, this workstation powerhouse runs the most complex computing workloads seamlessly. |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### CPU

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| Processor Support | Dual 4th/5th Generation Intel Xeon Scalable Processors |
| Socket Type       | Socket-E (LGA-4677)                                    |
| Disclaimers       |                                                        |

### Operating Systems

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Preloaded   | Windows 11 Pro 64-bit for Workstation<br>Ubuntu 22.04 LTS (configuration specific)                   |
| Supported   | Red Hat Enterprise Linux 9.2<br>Red Hat Enterprise Linux 9.4<br>Ubuntu 20.04 LTS<br>Ubuntu 22.04 LTS |
| Disclaimers |                                                                                                      |

### Memory

|             |                                         |
|-------------|-----------------------------------------|
| Slots       | Up to 16 DIMMS (8 DIMMs per CPU)        |
| Channels    | 8 Memory Channels per CPU               |
| Type        | DDR5, 288-Pin, ECC RDIMM and 3DS RDIMM* |
| ECC Support | Yes                                     |



|                   |                                                  |
|-------------------|--------------------------------------------------|
| Speed             | Up to 5600MHz                                    |
| Max DIMM Size     | 128GB DDR5 ECC RDIMM<br>128GB DDR5 ECC 3DS-RDIMM |
| Max System Memory | 2TB                                              |
| Disclaimers       | *Actual Memory Speed is dependent on the CPU.    |

## Storage

|                 |                                                                                        |
|-----------------|----------------------------------------------------------------------------------------|
| Total Bays/Size | Up to 4                                                                                |
| SATA            | 3 x SFF-8680 Receptacles<br>1 x SATA 3.0 Connectors                                    |
| PCIe (M.2)      | 3 x M.2 NVMe 2280 PCIe Connectors Onboard<br>4 x M.2 NVMe 2280 Front Accessible Drives |
| Disclaimers     | *See Storage Whitepaper for details on the available usage options.                    |

## Video

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integrated Graphics | Not Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Discrete Graphics   | NVIDIA T400(MiniDP x3) – 4GB GDDR6, PCIe3, Single-Slot<br>NVIDIA T1000(MiniDP x4) – 8GB GDDR6, PCIe3, Single-Slot<br>NVIDIA RTX A2000(MiniDP x4) – 12GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX A4000 (DP x4) – 16GB GDDR6, PCIe4, Single-Slot<br>NVIDIA RTX A4500(DP x4) – 20GB, GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX A5000(DP x4) – 24GB, GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX A5500(DP x4) – 24GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX A6000(DP x4) – 48GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX6000 Ada(DP x4) – 48GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX5880 Ada(DP x4) – 48GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX5000 Ada(DP x4) – 32GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX4500 Ada(DP x4) – 24GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA RTX4000 Ada(DP x4) – 20GB GDDR6, PCIe4, Single-Slot<br>NVIDIA AI000(MiniDP x4) – 8GB GDDR6, PCIe4, Single-Slot<br>NVIDIA A400(MiniDP x4) – 4GB GDDR6, PCIe4, Single-Slot<br>NVIDIA A800 – 40GB GDDR6, PCIe4, Dual-Slot<br>NVIDIA Quadro SYNC II card |
| Multi-GPU Support   | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Type                | PCIe Add-In-Card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Bus Interface       | PCIe x16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Disclaimers         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Slots

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Slot 1      | PCIe 4.0 x16, Full Height, Full Length, 75W (CPU 2)            |
| Slot 2      | PCIe 4.0 x16, Full Height, Full Length, 75W (CPU 2)            |
| Slot 3      | PCIe 5.0 x16, Full Height, Full Length, 75W (CPU 2)            |
| Slot 4      | PCIe 5.0 x16, Full Height, Full Length, 75W (CPU 2)            |
| Slot 5      | PCIe 4.0 x8, Full Height, Full Length, 25W, Open Ended (CPU 2) |
| Slot 6      | PCIe 5.0 x16, Full Height, Full Length, 75W (CPU 1)            |
| Slot 7      | PCIe 4.0 x16, Full Height, Full Length, 75W (CPU 1)            |
| Slot 8      | PCIe 5.0 x16, Full Height, Full Length, 75W (CPU 1)            |
| Slot 9      | PCIe 4.0 x16, Full Height, Full Length, 75W (CPU 1)            |
| Disclaimers |                                                                |

## Front I/O

|       |                                                                                                                        |
|-------|------------------------------------------------------------------------------------------------------------------------|
| USB   | 1 x USB-A 3.2 Gen 2 (10Gbps)<br>1 x USB-A 3.2 Gen 2 (10Gbps) (with Always On Charging)<br>2 x USB-C 3.2 Gen 2 (10Gbps) |
| Audio | 1 x 3.5mm Global Headset Jack (Headphone + Mic in)                                                                     |

|                   |                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------|
| Media Card Reader | N/A                                                                                           |
| Flex Bay          | 3 x Front access drive bay<br>Rear Flex Storage Enclosure (Shared with 2nd PSU Bay)           |
| Disclaimers       | Note: Actual USB throughout will vary depending on the type and quantity of USB devices used. |

## Rear I/O

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USB                      | 2 x USB-A 2.0 (480Mbps)<br>4 x USB-A 3.2 Gen 1 (5Gbps)<br>1 x USB-C 3.2 Gen 2x2 (20Gbps)                                                                                                                                                                                                                                                                                                                                                     |
| Audio                    | 2 x Rear (Line Out, Line In retasked as Mic)                                                                                                                                                                                                                                                                                                                                                                                                 |
| DisplayPort              | As Supported by GPU                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HDMI                     | As Supported by GPU                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Serial Port              | Optional 1x Rear Port                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ethernet                 | 1 x 1GbE – RJ45<br>1 x 10GbE – RJ45                                                                                                                                                                                                                                                                                                                                                                                                          |
| PS/2                     | Optional PS/2 (2 port) PCIe adapter                                                                                                                                                                                                                                                                                                                                                                                                          |
| Optional Network Adapter | Broadcom 5720 Dual Port Gigabit PCIe Ethernet Adapter<br>Broadcom 5719 Quad Port Gigabit PCIe Ethernet Adapter<br>Bitland RTL8168H 1000M PCIe Ethernet Adapter<br>Intel I210-T1 Single Port Gigabit PCIe Ethernet Adapter<br>Intel I350-T2 Dual Port Gigabit PCIe Ethernet Adapter<br>Intel I350-T4 Quad Port Gigabit PCIe Ethernet Adapter<br>Intel AX210 WIFI PCIe Adapter with Internal Antennas<br>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 AQCN13C-B1-C<br>Intel 1 GbE I219 (Vpro, AMT)         |
| Speeds      | 10/100/1000/10000Mbps Aquantia AQCN13C<br>10/100/1000Mbps Intel I219 |
| Functions   | PXE, WOL, Jumbo Frames<br>ASF, Teaming (Intel only)                  |
| 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                      | 2 x Rear 3.5mm Jacks (Line Out, Line In retasked as Mic)<br>1 x Front 3.5mm Global Headset Jack (Headphone + Mic in)                                                                                                                                                                          |
| Chipset                         | Realtek ALC897Q Codec (rear)<br>Realtec ALC4032 (front)                                                                                                                                                                                                                                       |
| Number of Channels              | Rear Audio: 2 Channels<br>Front Audio: 2 Channels                                                                                                                                                                                                                                             |
| Number of Bits/Audio Resolution | Rear Codec:<br>10 Channel DAC Supports 16/20/24-bit PCM<br>2 Stereo ADC Supports 16/20/24-bit PCM<br>Front Codec:<br>One stereo DAC supports 8/16/22.05/24/32/44.1/48/96/176.4/192KHz Sample Rate, 16/24-bit<br>One stereo ADC supports 8/16/22.05/24/32/44.1/48/96KHz Sample Rate, 16/24-bit |
| 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<br>PCIe Zone 1 Sensor – Thermistor<br>PCIe Zone 2 Sensor – Thermistor<br>PCIe Zone 3 Sensor – Thermistor<br>PCIe Zone 4 Sensor – Thermistor<br>M.2 Zone 1 Sensor – Thermistor<br>M.2 Zone 2 Sensor – Thermistor<br>MISC Sensor – Thermistor<br>HDD 1 Sensor – I2C Temp Sensor<br>HDD 2 Sensor – I2C Temp Sensor<br>HDD 3 Sensor – I2C Temp Sensor<br>PSU Bay 2 (HDD) Sensor – I2C Temp Sensor                                                                                                                                                                                                                                                                                    |
| Fans         | 2 x Front Fans (FRONT_FAN1) – 6-pin blind connect 1 Connector per 2 Fans<br>1 x Front Fan (FRONT_FAN2) – 4-pin blind connect 1 Connector per 1 Fans<br>1 x Front Fan (FRONT_FAN3) – 4-pin blind connect 1 Connector per 1 Fans<br>2 x Rear Fans (REAR_FAN1) – 6-pin blind connect 1 Connector per 2 Fans<br>1 x CPU 1 Fan (CPU1_FAN) – 4-pin header with 3-pin key<br>1 x CPU 2 Fan (CPU2_FAN) – 4-pin header with 3-pin key<br>1 x PSU HDD Fan (PSU_HDD_FAN) – PSU Edge Connector<br>3 x HDD Fans (HDD_FAN_X) – 4-pin header with 3-pin key<br>2 x PSU1 Fans – internal of PSU<br>2 x PSU2 Fans – internal of PSU<br>1 x CPU1 Memory Fan – CPU1_Pump_DDR – 4-pin header with 3-pin key<br>1 x CPU2 Memory Fan – CPU2_Pump_DDR – 4-pin header with 3-pin key |
| Disclaimers  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Power Specifications

|                                                                                                                            |                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Power Supply                                                                                                               | 1850 watts                                                                                                                   |
| Power Efficiency                                                                                                           | 92% Efficient @ 50% Load                                                                                                     |
| Main                                                                                                                       | C20                                                                                                                          |
| 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                                                                                                        | 13 – 20A                                                                                                                     |
| Graphics                                                                                                                   | Up to 8 x 8-pin (6+2) PCIe*                                                                                                  |
| Power Supply Fan                                                                                                           | Yes                                                                                                                          |
| ENERGY STAR  Qualified (config dependent) | Yes                                                                                                                          |
| 80 PLUS Compliant                                                                                                          | Yes                                                                                                                          |
| Built-in Self Test (BIST) LED                                                                                              | Yes                                                                                                                          |
| Disclaimers                                                                                                                | *Quantity of Graphics power cables is configuration dependent<br>*See Power Configuration Whitepaper for additional details. |

## BIOS

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

## Chassis Information

|                   |                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Color             | Storm Gray                                                                                                                                 |
| PSU               | One Fixed 1850W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified<br>Optional: 2nd 1850W, Autosensing, 92% PSU, 80 PLUS Platinum Qualified |
| Thermal Solutions | 2 Rear Fans<br>4 Front Fans<br>1 Fan per storage bay<br>1 Fan per CPU<br>2 Fans per PSU<br>Memory Fans (configuration dependent)           |
| Dimensions        | 434.4mm/17.1" H (without feet)<br>440.4mm/17.3" H (with feet)<br>575mm/22.6" D<br>220mm/8.7" W                                             |

|             |                     |
|-------------|---------------------|
| Weight      | 35.6 kg / 78.48 lbs |
| Disclaimers |                     |

Packaging Dimensions

|                  |                       |
|------------------|-----------------------|
| Height (mm/in)   | 658mm / 25.91"        |
| Width (mm/in)    | 397mm / 15.63"        |
| Depth (mm/in)    | 802mm / 31.57"        |
| Weight (kgs/lbs) | 40.135 kg / 88.48 lbs |
| Disclaimers      |                       |

Security & Serviceability

|                                                                    |                                                                                                                 |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| TPM                                                                | Infineon SPI TPM SLB9672 TPM 2.0                                                                                |
| 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                                                                                                             |
| Boot Sequence Control                                              | Yes                                                                                                             |
| Padlock Support                                                    | No                                                                                                              |
| 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-less*                                                                                                      |
| 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                                                        | *Note: CPU Heatsink assembly requires a T30 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<br>Storage: -10_C to 60_C (14_F to 140_F) Without Carton                                                                                                          |
| Humidity        | Relative Humidity Operating: 10% to 80% (non-condensing)<br>Relative Humidity Storage/Transit: 10% to 90% (non-condensing)<br>Wet Bulb Temperature Operating: 25_C (77_F) max<br>Wet Bulb Temperature Non-operating: 40_C (104_F) max |
| Altitude        | Upper limits decrease 1C (1.8F) per 300 m (1000 ft) above sea level                                                                                                                                                                   |
| Vibration       | Operating Vibration:<br>Random,0.27G at 5-500 Hz, 30 Minutes Per Surface (X,Y,Z)<br>Non-Operating Vibration:<br>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<br>Operating (Rack mounted): X,Y,Z axis: +- 15G/3ms<br>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 | 16.26" x 15.43" (413mm x 392mm) |
| Layout     | Lenovo Custom Extended ATX      |

### Motherboard Core

|                      |                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor Support    | Intel Sapphire Rapids – Xeon Scalable Processors (Platinum, Gold, Silver)<br>Intel Emerald Rapids – Xeon Scalable Processors (Platinum, Gold, Silver) |
| Socket Type          | Socket E (LGA 4677)                                                                                                                                   |
| Memory Support       | DDR5 up to 5600MHz RDIMM / 3DS RDIMM Memory                                                                                                           |
| CPU-CPU Interconnect | Intel UPI v2.0, 3 links, x24, at speeds 12.8GT/s, 14.4GT/s and 16GT/s                                                                                 |
| Voltage Regulator    | Intel VR14.0 – 400W TDP Capable                                                                                                                       |
| Chipset (PCH)        | Intel Emmitsburg (Intel C741 Series)                                                                                                                  |
| Flash                | 2 x 64MB                                                                                                                                              |
| Super I/O            | 2 x MEC1723(176 pin)                                                                                                                                  |
| Clock                | External Clock                                                                                                                                        |
| Audio                | Rear Codec: Realtek ALC897Q (Rear I/O)<br>Front Codec: Realtek ALC4032 (FPIO)                                                                         |
| Ethernet             | Aquantia 10Gb AQCN13C-B1-C<br>Intel 1Gb I219                                                                                                          |

### Supported Components

|                 |                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                               |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Processor Level | Intel Xeon Platinum                                                                                                                                                                                                                                                  |  | Intel Xeon Gold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Intel Xeon Silver                                                                                                             |
| Processor       | Intel Xeon Emerald Rapids Platinum 8592+<br>Intel Xeon Emerald Rapids Platinum 8580<br>Intel Xeon Emerald Rapids Platinum 8570<br>Intel Xeon Emerald Rapids Platinum 8568Y+<br>Intel Xeon Sapphire Rapids Platinum 8490H<br>Intel Xeon Sapphire Rapids Platinum 8468 |  | Intel Xeon Emerald Rapids Gold 6548Y+<br>Intel Xeon Emerald Rapids Gold 6544Y<br>Intel Xeon Emerald Rapids Gold 6542Y<br>Intel Xeon Emerald Rapids Gold 6534<br>Intel Xeon Emerald Rapids Gold 6530<br>Intel Xeon Emerald Rapids Gold 6526Y<br>Intel Xeon Sapphire Rapids Gold 6444Y<br>Intel Xeon Sapphire Rapids Gold 6442Y<br>Intel Xeon Sapphire Rapids Gold 6438Y+<br>Intel Xeon Sapphire Rapids Gold 6430<br>Intel Xeon Sapphire Rapids Gold 6418H<br>Intel Xeon Sapphire Rapids Gold 6416H<br>Intel Xeon Sapphire Rapids Gold 5420+<br>Intel Xeon Sapphire Rapids Gold 5418Y<br>Intel Xeon Sapphire Rapids Gold 5416S<br>Intel Xeon Sapphire Rapids Gold 5415+ | Intel Xeon Sapphire Rapids Silver 4416+<br>Intel Xeon Sapphire Rapids Silver 4410Y<br>Intel Xeon Sapphire Rapids Silver 4410T |
| Memory Type     | RDIMMs – 5600MT/s, CPU Dependent<br>RDIMMs – 4800MT/s, CPU Dependent                                                                                                                                                                                                 |  | 3DS-RDIMMs – 4800MT/s, CPU Dependent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                               |
| Memory          | 16GB DDR5 ECC RDIMM PC5-5600<br>32GB DDR5 ECC RDIMM PC5-5600<br>64GB DDR5 ECC RDIMM PC5-5600<br>128GB DDR5 ECC RDIMM PC5-5600<br>16GB DDR5 ECC RDIMM PC5-4800<br>32GB DDR5 ECC RDIMM PC5-4800<br>64GB DDR5 ECC RDIMM PC5-4800                                        |  | 128GB DDR5 ECC 3DS-RDIMM PC5-4800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |
| Disclaimers     |                                                                                                                                                                                                                                                                      |  | Additional CPU SKU's certified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                               |

### Storage

|                                  |                                                                                                                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.5" SATA Hard Disk Drive (HDD)  | 2TB SATA – 7200rpm, 6Gb/s, 3.5"<br>4TB SATA – 7200rpm, 6Gb/s, 3.5" (Enterprise Class)<br>6TB SATA – 7200rpm, 6Gb/s, 3.5" (Enterprise Class)<br>12TB SATA – 7200rpm, 6Gb/s, 3.5" (Enterprise Class) |
| M.2 PCIe Solid State Drive (SSD) | 512GB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0<br>1024GB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0                                                                            |

|             |                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | 2048GB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0<br>4096GB M.2 PCIe – SSD, 2280, Gen5 (x4), NVMe, TLC, OPAL2.0<br>512GB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0<br>1024GB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0<br>2048GB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0<br>4096GB M.2 PCIe – SSD, 2280, Gen4 (x4), NVMe, TLC, OPAL2.0 |
| Disclaimers | Additional Storage devices certified.                                                                                                                                                                                                                                                                                                                                           |

## RAID

|                   |                                                                                                                                                                                                                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RAID Requirements | M.2 and SATA RAID via Intel VROC 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.<br>Max supported RAID 0/1/5/10. |
| Intel VROC        | Intel Virtual RAID On CPU (VROC) – Basic, Supports 0/1/10<br>Intel Virtual RAID On CPU (VROC) – Premium, Supports 0/1/5/10                                                                                                                                                                         |

## Optical Drive/Removable Media

## Keyboard and Pointing Devices

|                  |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Keyboard         | USB Traditional Keyboard<br>PS/2 Tradition Keyboard<br>Smart Card Keyboard<br>USB Calliope Keyboard<br>USB Calliope AI Keyboard |
| Pointing Devices | USB Fingerprint Mouse<br>USB Calliope Mouse<br>PS/2 Black Optical Mouse                                                         |

## Expansion Bays

|                            |                                                                                                         |
|----------------------------|---------------------------------------------------------------------------------------------------------|
| 5.25" External Access Bays | 3 x Front access drive bays<br>1 x Rear PSU bay storage enclosure (Utilizes 2nd PSU bay)*               |
| Disclaimers                | See Storage Configuration whitepaper for detailed usage<br>*Only available on single PSU configurations |

## PCIe Adapters

|                          |                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network                  | Broadcom 5720 Dual Port Gigabit Ethernet Adapter<br>Broadcom 5719 Quad Port Gigabit Ethernet Adapter<br>Bitland RTL8168H 1000M PCIe Ethernet Adapter<br>Intel I210-T1 Single Port Gigabit Ethernet Adapter<br>Intel I350-T2 Dual Port Gigabit Ethernet Adapter<br>Intel I350-T4 Quad Port Gigabit Ethernet Adapter<br>NVIDIA ConnectX-6 25G 2-Ports Adapter |
| Thunderbolt              | Rear Maple Ridge Thunderbolt PCIe Adapter                                                                                                                                                                                                                                                                                                                   |
| WiFi Cards               | Intel PCIe WiFi Card With BT Internal Antenna Kit (AX210 6E)                                                                                                                                                                                                                                                                                                |
| PS/2                     | PS/2 (2-Port) PCIe adapter                                                                                                                                                                                                                                                                                                                                  |
| Com port                 | Serial COM port cable with 5V transceiver                                                                                                                                                                                                                                                                                                                   |
| PCIe to M.2 Adapter Card | ThinkStation PCIe Gen4 Quad M.2 SSD Adapter<br>ThinkStation PCIe Gen5 Quad M.2 SSD Adapter                                                                                                                                                                                                                                                                  |
| Other                    | BMC PCIe Adapter                                                                                                                                                                                                                                                                                                                                            |

SECTION III: Supported Component Detail

CPU Specifications Group 1

|             |                                           |                                          |                                       |                                        |                                      |
|-------------|-------------------------------------------|------------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|
| CPU         | Intel XEON Sapphire Rapids Platinum 8490H | Intel XEON Sapphire Rapids Platinum 8468 | Intel XEON Sapphire Rapids Gold 6442Y | Intel XEON Sapphire Rapids Gold 6438Y+ | Intel XEON Sapphire Rapids Gold 6430 |
| Disclaimers |                                           |                                          |                                       |                                        |                                      |

CPU Specifications Group 2

|             |                                       |                                       |                                       |                                       |                                       |
|-------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| CPU         | Intel XEON Sapphire Rapids Gold 6418H | Intel XEON Sapphire Rapids Gold 6416H | Intel XEON Sapphire Rapids Gold 5420+ | Intel XEON Sapphire Rapids Gold 5418Y | Intel XEON Sapphire Rapids Gold 5416S |
| Disclaimers |                                       |                                       |                                       |                                       |                                       |

CPU Specifications Group 3

|             |                                       |                                         |                                         |                                         |
|-------------|---------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
| CPU         | Intel XEON Sapphire Rapids Gold 5415+ | Intel XEON Sapphire Rapids Silver 4416+ | Intel XEON Sapphire Rapids Silver 4410Y | Intel XEON Sapphire Rapids Silver 4410T |
| Disclaimers |                                       |                                         |                                         |                                         |

HDD Specifications Group 1

|                                 |                                   |                                       |                                       |                                            |
|---------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------|
| Drive                           | 500GB SATA – 7200rpm, 6Gb/s, 2.5" | 1TB SATA – 7200rpm, 6Gb/s, 3.5"       | 2TB SATA – 7200rpm, 6Gb/s, 3.5"       | 4TB SATA – 7200rpm, 6Gb/s, 3.5"            |
| 3.5_ SATA Hard Disk Drive (HDD) | Not Available                     | Yes                                   | Yes                                   | Yes                                        |
| 2.5_ SATA Hard Disk Drive (HDD) | Yes                               | Not Available                         | Not Available                         | Not Available                              |
| Connector                       | SATA                              | SATA                                  | SATA                                  | SATA                                       |
| Transfer Rate (Gb/sec)          | 160MB/s OD read                   | Average data rate, read/write 156MB/s | Average data rate, read/write 156MB/s | Sustained data transfer rate 216 – 226MB/s |
| Spindle Speed (RPM)             | 7,200                             | 7,200                                 | 7,200                                 | 7,200                                      |
| DC Power to Drive Ready (sec)   | 3.5                               | <10.0                                 | <17.0                                 | <17.0                                      |
| Average Latency (msec)          | 4.2                               | 4.16                                  | 4.16                                  | 4.16                                       |
| Input (VDC)                     | 5                                 | 5                                     | 5                                     | 5                                          |
| Typical (Watts)                 | 1.9                               | 6.19                                  | 6.7                                   | 7.35                                       |
| Idle (Watts)                    | 0.7                               | 4.6                                   | 4.5                                   | 5.45                                       |
| Physical Dimensions             | 69.85mm x 100.34mm x 7mm          | 101.6mm x 146.99mm x 19.88mm          | 101.6mm x 146.99mm x 26.1mm           | 101.85mm x 147mm x 26.1mm                  |
| Weight (grams)                  | 90                                | 420                                   | 535                                   | 680                                        |
| Operating (C) Ambient           | 0 to 60                           | 0 to 60                               | 0 to 60                               | 5 to 60                                    |
| Operating (C) Base Casting      | 60                                | 60                                    | 60                                    | 60                                         |
| Non-Operating (C) Ambient       | (-40 to 70)                       | (-40 to 70)                           | (-40 to 70)                           | (-40 to 70)                                |
| Gradient (C per Hour)           | 20                                | 20                                    | 20                                    | 20                                         |
| Operating (Gs @ 2ms)            | 400                               | 70                                    | 80                                    | Read 70 Gs / Write 40 Gs                   |
| Non-Operating (Gs @ 2ms)        | 1000                              | 350                                   | 300                                   | 300                                        |
| Disclaimers                     |                                   |                                       |                                       |                                            |

HDD Specifications Group 2

|                                 |                                            |
|---------------------------------|--------------------------------------------|
| Drive                           | 6TB SATA – 7200rpm, 6Gb/s, 3.5"            |
| 3.5_ SATA Hard Disk Drive (HDD) | Yes                                        |
| 2.5_ SATA Hard Disk Drive (HDD) | Not Available                              |
| Connector                       | SATA                                       |
| Transfer Rate (Gb/sec)          | Sustained data transfer rate 216 – 226MB/s |
| Spindle Speed (RPM)             | 7,200                                      |

|                               |                           |
|-------------------------------|---------------------------|
| DC Power to Drive Ready (sec) | <17.0                     |
| Average Latency (msec)        | 4.16                      |
| Input (VDC)                   | 5                         |
| Typical (Watts)               | 8.13                      |
| Idle (Watts)                  | 6.21                      |
| Physical Dimensions           | 101.85mm x 147mm x 26.1mm |
| Weight (grams)                | 705                       |
| Operating (C) Ambient         | 5 to 60                   |
| Operating (C) Base Casting    | 60                        |
| Non-Operating (C) Ambient     | (-40 to 70)               |
| Gradient (C per Hour)         | 20                        |
| Operating (Gs @ 2ms)          | Read 70 Gs / Write 40 Gs  |
| Non-Operating (Gs @ 2ms)      | 250                       |
| Disclaimers                   |                           |

Solid State Storage Specifications Group 1

|                                    |                                                                                                                                                                                                                        |                        |                         |                         |                      |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------|-------------------------|----------------------|
| Drive                              | 256GB NVMe M.2 SSD TLC                                                                                                                                                                                                 | 512GB NVMe M.2 SSD TLC | 1024GB NVMe M.2 SSD TLC | 2048GB NVMe M.2 SSD TLC | 480GB AIC Optane SSD |
| Dimensions Millimeters (W x D x H) | 22 x 80 x 2.3                                                                                                                                                                                                          | 22 x 80 x 2.3          | 22 x 80 x 2.3           | 22 x 80 x 2.3           | 20 x 168 x 104       |
| Interface Type                     | PCIe Gen 3.0 x4 NVMe                                                                                                                                                                                                   | PCIe Gen 3.0 x4 NVMe   | PCIe Gen 3.0 x4 NVMe    | PCIe Gen 3.0 x4 NVMe    | PCIe Gen 3.0 x4 NVMe |
| Power Active (AVG)                 | 5W                                                                                                                                                                                                                     | 5W                     | 5W                      | 5W                      | 18W                  |
| Power Idle                         | 50mW                                                                                                                                                                                                                   | 50mW                   | 50mW                    | 50mW                    | 7W                   |
| Typical Sequential Read            | 3000MB/s                                                                                                                                                                                                               | 3200MB/s               | 3200MB/s                | 3500MB/s                | 2700MB/s             |
| Typical Sequential Write           | 1300MB/s                                                                                                                                                                                                               | 1600MB/s               | 1600MB/s                | 3000MB/s                | 2200MB/s             |
| Operating Temperature Range        | 0 to 55C                                                                                                                                                                                                               | 0 to 55C               | 0 to 55C                | 0 to 55C                | 0 to 85C             |
| Endurance Rating (Lifetime Writes) | 85TB                                                                                                                                                                                                                   | 150TB                  | 300TB                   | 600TB                   | 8.76PB               |
| Mean Time Between Failures (MTBF)  | 2.0M POH                                                                                                                                                                                                               | 2.0M POH               | 2.0M POH                | 2.0M POH                | 2.0M POH             |
| Hardware Encryption                | AES 256 bit                                                                                                                                                                                                            | AES 256 bit            | AES 256 bit             | AES 256 bit             | No                   |
| 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. |                        |                         |                         |                      |

Solid State Storage Specifications Group 2

|                                    |                                                                                                                                                                                                                        |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drive                              | 1.5TB U.2 Optane SSD                                                                                                                                                                                                   |
| Dimensions Millimeters (W x D x H) | 70 x 100 x 15                                                                                                                                                                                                          |
| Interface Type                     | PCIe Gen 3.0 x4 NVMe                                                                                                                                                                                                   |
| Power Active (AVG)                 | 18W                                                                                                                                                                                                                    |
| Power Idle                         | 7W                                                                                                                                                                                                                     |
| Typical Sequential Read            | 2700MB/s                                                                                                                                                                                                               |
| Typical Sequential Write           | 2200MB/s                                                                                                                                                                                                               |
| Operating Temperature Range        | 0 to 85C                                                                                                                                                                                                               |
| Endurance Rating (Lifetime Writes) | 27.3PB                                                                                                                                                                                                                 |
| Mean Time Between Failures (MTBF)  | 2.0M POH                                                                                                                                                                                                               |
| Hardware Encryption                | No                                                                                                                                                                                                                     |
| 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 10 Pro for Workstations (Preload)<br>Windows 7 Pro 64<br>Red Hat Enterprise Linux 7.3<br>Ubuntu 16.04 and 18.04.2 |
| 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 A2000                                                             | RTX A4000                                             | RTX A4500    |
| Bus Interface                                                                  | PCIe 3.0 x16                   | PCIe 3.0 x16                   | PCIe 4.0 x16                                                          | PCIe 4.0 x16                                          | PCIe 4.0 x16 |
| Display Interface                                                              | 3 x mDP 1.4                    | 4 x mDP 1.4                    | 4 x mDP 1.4a                                                          | 4 x DP 1.4a                                           | 4 x DP 1.4   |
| Graphics Chipset                                                               | Turing                         | Turing                         | Coming Soon                                                           | Ampere                                                | Coming Soon  |
| Memory Clock Frequency (MHz)                                                   | Coming Soon                    | Coming Soon                    | Coming Soon                                                           | Coming Soon                                           | Coming Soon  |
| Memory Size                                                                    | 2GB GDDR6                      | 4GB GDDR6                      | Coming Soon                                                           | 16GB GDDR6                                            | Coming Soon  |
| Memory Interface                                                               | 64-bit                         | 128-bit                        | Coming Soon                                                           | 256-bit                                               | Coming Soon  |
| Memory Bandwidth                                                               | 80GB/s                         | 160GB/s                        | Coming Soon                                                           | 448 GB/s                                              | Coming Soon  |
| GPU Cores                                                                      | CUDA Cores: 384                | CUDA Cores: 896                | Coming Soon                                                           | CUDA Cores: 6411<br>Tensor Cores: 192<br>RT Cores: 48 | Coming Soon  |
| Maximum Power Consumption                                                      | 30W                            | 50W                            | Coming Soon                                                           | 140W                                                  | Coming Soon  |
| Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital) | Coming Soon                    | Coming Soon                    | 4 x 4096×2160 @ 120Hz<br>4 x 5120×2880 @ 60Hz<br>2 x 7680×4320 @ 60Hz | Coming Soon                                           | Coming Soon  |
| Thermal Solution                                                               | Active                         | Active                         | Coming Soon                                                           | Active                                                | Coming Soon  |
| Dimension                                                                      | 2.7" H x 6.1" L<br>Single Slot | 2.7" H x 6.1" L<br>Single Slot | Coming Soon                                                           | 4.4" H x 9.5" L<br>Single Slot                        | Coming Soon  |
| Advanced Display                                                               | Coming Soon                    | Coming Soon                    | Coming Soon                                                           | SYNC 2                                                | Coming Soon  |
| SLI/NVLink Support                                                             | Coming Soon                    | Coming Soon                    | Coming Soon                                                           | Coming Soon                                           | Coming Soon  |
| Disclaimers                                                                    |                                |                                |                                                                       |                                                       |              |

## Discrete Graphics Adapter Group 2

|                              |              |                                         |              |
|------------------------------|--------------|-----------------------------------------|--------------|
| Adapter                      | RTX A5500    | RTX A6000                               | RTX 6000 Ada |
| Bus Interface                | PCIe 4.0 x16 | PCIe 4.0 x16                            | Coming Soon  |
| Display Interface            | 4 x DP 1.4a  | 4 x DP 1.4a                             | Coming Soon  |
| Graphics Chipset             | Coming Soon  | Ampere                                  | Coming Soon  |
| Memory Clock Frequency (MHz) | Coming Soon  | 2000MHz                                 | Coming Soon  |
| Memory Size                  | Coming Soon  | 48GB GDDR6                              | Coming Soon  |
| Memory Interface             | Coming Soon  | 384-bit                                 | Coming Soon  |
| Memory Bandwidth             | Coming Soon  | Up to 768GB/s                           | Coming Soon  |
| GPU Cores                    | Coming Soon  | CUDA Cores: 10,752<br>Tensor Cores: 336 | Coming Soon  |

|                                                                                |             |                                                                       |             |
|--------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------|-------------|
|                                                                                |             | RT Cores: 84                                                          |             |
| Maximum Power Consumption                                                      | Coming Soon | 300W                                                                  | Coming Soon |
| Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital) | Coming Soon | 4 x 4096x2160 @ 120Hz<br>4 x 5120x2880 @ 60Hz<br>2 x 7680x4320 @ 60Hz | Coming Soon |
| Thermal Solution                                                               | Coming Soon | Active                                                                | Coming Soon |
| Dimension                                                                      | Coming Soon | 4.4" H x 10.5" L<br>Dual Slot, Full Height                            | Coming Soon |
| Advanced Display                                                               | Coming Soon | SYNC 2                                                                | Coming Soon |
| SLI/NVLink Support                                                             | Coming Soon | NVLink                                                                | Coming Soon |
| Disclaimers                                                                    |             |                                                                       |             |

## Ethernet Specifications Group 1 Part 1

|                                          |                                                                                                                          |                                                                                                                          |                                                                                                                          |                                                                                                                          |                                                                                                                                                                                      |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Card                                     | Intel I210-T1 Single Port Gigabit Ethernet Adapter (Springville)                                                         | Intel I350-T2 Dual Port Gigabit Ethernet Adapter (Stony Lake T2)                                                         | Intel I350-T4 Quad Port Gigabit Ethernet Adapter (Stony Lake T4)                                                         | Intel X540-T2 Dual Port Copper 10Gb Ethernet Adapter                                                                     | Intel X710-DA2 Dual Port Fiber 10Gb Ethernet Adapter                                                                                                                                 |
| Supplier PN                              | I210T1, MM# 941033                                                                                                       | I350T2G1P20, MM# 928941                                                                                                  | I350T4G1P20, MM# 928942                                                                                                  | MM#928955                                                                                                                | MM# 952103                                                                                                                                                                           |
| Data Rates Supported                     | 10/100/1000Mbps copper                                                                                                   | 10/100/1000Mbps (Copper), 1000Mbps (Fiber)                                                                               | 10/100/1000Mbps (Copper), 1000Mbps (Fiber)                                                                               | 100/1000Mbps and 10Gbps Copper                                                                                           | 1GbE/10GbE Optical fiber<br>10GbE Direct Attach (DAC)                                                                                                                                |
| Controller Details                       | Intel Ethernet Controller I210                                                                                           | Intel Ethernet Controller I350                                                                                           | Intel Ethernet Controller I351                                                                                           | Intel Ethernet Controller X540                                                                                           | Intel Ethernet Controller X710-AM2                                                                                                                                                   |
| Controller Bus Architecture              | PCIe 2.1 (5GT/s)                                                                                                         | PCIe 2.1 (5GT/s)                                                                                                         | PCIe 2.1 (5GT/s)                                                                                                         | PCIe 2.1 (5GT/s)                                                                                                         | PCIe 3.0 (8GT/s)                                                                                                                                                                     |
| Data Transfer Mode                       | Ethernet                                                                                                                 | Ethernet                                                                                                                 | Ethernet                                                                                                                 | Ethernet                                                                                                                 | Ethernet                                                                                                                                                                             |
| Power Consumption                        | 0.81W                                                                                                                    | Copper:<br>I350-T2 V2= 4.4W<br>Fiber:<br>I350-F2= 5.5W                                                                   | Copper:<br>I350T4V2= 5W<br>LC-Fiber:<br>I350F4= 6W                                                                       | X540-T2:<br>10Gps= 17.4W<br>1Gbps= 9.5W<br>100Mbps=6.6W<br>X540-T1:<br>10Gbps=10.8W<br>1Gbps= 7.7W<br>100Mbps= 6.4W      | Dual-port 10GBASE-SR= 4.3W typ/4.8W max<br>Dual-port 1000BASE-SX= 4W typ/4.3W max<br>Dual-port 10GBASE-LR= 4.5W typ/ 5.1W max<br>Dual-port Direct Attach (Twinax)= 3.3W typ/3.7W max |
| IEEE Standards Compliance                | IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T                                                                              | 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                                                                                            | IEEE 802.3/10/10GBASE-SR/LR, SFF-8431 10GSFP+DAC                                                                                                                                     |
| 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 | 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) | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                                                                            |
| Network Transfer Rate                    | 1,000Mbps Full Duplex                                                                                                    | 1,000Mbps Full Duplex                                                                                                    | 1,000Mbps Full Duplex                                                                                                    | 1,000Mbps Full Duplex                                                                                                    | 1,000Mbps Full Duplex                                                                                                                                                                |
| 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, Linux, Free BSD, XEN,Vmware                                                                              | Windows 7/8/10, Windows ServerLinux, FreeBSD                                                                             | Windows 2008, 2012; RHEL 6.5/7.0, FreeBSD 9/10, Vmware ESXi 5.x                                                                                                                      |
| Manageability                            | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                                                                            |
| Manageability Capabilities Alerting      | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                                                                            |
| TDP                                      | Firmware Based Thermal Management                                                                                        | Firmware Based Thermal Management                                                                                        | Firmware Based Thermal Management                                                                                        | Firmware Based Thermal Management                                                                                        | Not Available                                                                                                                                                                        |
| Operating Temperature Range              | 0C to 55C (32F to 131F)                                                                                                  | 0C to 55C (32F to 131F)                                                                                                  | 0C to 55C (32F to 131F)                                                                                                  | 0C to 55C (32F to 131F)                                                                                                  | 0C to 55C (32F to 131F)                                                                                                                                                              |
| # of Ports                               | 1                                                                                                                        | 2                                                                                                                        | 4                                                                                                                        | 2                                                                                                                        | 2                                                                                                                                                                                    |
| Data Rate Per Port                       | 10/100/1000Mbps (copper)                                                                                                 | 10/100/1000Mbps (copper), 1000Mbps (fiber)                                                                               | 10/100/1000Mbps (copper), 1000Mbps (fiber)                                                                               | 100/1,000Mbps, 10Gbps                                                                                                    | 1Gbps, 10Gbps                                                                                                                                                                        |
| System Interface Type                    | PCIe Gen 2.1                                                                                                             | PCIe Gen 2.1                                                                                                             | PCIe Gen 2.1                                                                                                             | PCIe Gen 2.1                                                                                                             | PCIe 3.0                                                                                                                                                                             |
| NC Sideband Interface                    | Not Available                                                                                                            | Not Available                                                                                                            | Not Available                                                                                                            | Not Available                                                                                                            | Yes                                                                                                                                                                                  |
| Jumbo Frames Supported                   | Yes                                                                                                                      | Yes                                                                                                                      | Yes                                                                                                                      | Yes                                                                                                                      | Yes                                                                                                                                                                                  |
| 1000Base-T                               | Yes                                                                                                                      | Yes                                                                                                                      | Yes                                                                                                                      | Yes                                                                                                                      | Not Available                                                                                                                                                                        |
| IEEE 1588                                | Supported                                                                                                                | Supported                                                                                                                | Supported                                                                                                                | Not Available                                                                                                            | Supported                                                                                                                                                                            |
| Supported Under vPro                     | Not Available                                                                                                            | Not Available                                                                                                            | Not Available                                                                                                            | Not Available                                                                                                            | Not Available                                                                                                                                                                        |
| Disclaimers                              |                                                                                                                          |                                                                                                                          |                                                                                                                          |                                                                                                                          |                                                                                                                                                                                      |

## Ethernet Specifications Group 1 Part 2

|       |         |                                                            |                                                             |                           |          |
|-------|---------|------------------------------------------------------------|-------------------------------------------------------------|---------------------------|----------|
| Model | i210-T1 | Dual Port Copper= I350-T2V2<br>Dual Port LC-Fiber= I350-F2 | Dual Port Copper= I350-T4 V2<br>Dual Port LC-Fiber= I350-F4 | Dual Port Copper= X540-T2 | X710-DA2 |
|-------|---------|------------------------------------------------------------|-------------------------------------------------------------|---------------------------|----------|

|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                          |                                                                 |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|
| Connector                                                 | RJ-45 Copper                                                                      | 2 x Ports RJ-45 Copper or 2 x Ports LC-Fiber                                      | 4 x Ports RJ-45 Copper or 4 x Ports LC-Fiber                                      | 2 x Ports RJ-45 Copper                                   | 2 x SFPs Receptable                                             |
| Website                                                   | i210 T1                                                                           | i350 T2/F2                                                                        | i350 T4/F4                                                                        | x540 T2                                                  | x710 DA2                                                        |
| Auto-Negotiation                                          | IEEE* 802.3* Auto-negotiaton                                                      | IEEE* 802.3* Auto-negotiaton                                                      | IEEE* 802.3* Auto-negotiation                                                     | IEEE* 802.3* Auto-negotiation                            | IEEE* 802.3* Auto-negotiaton                                    |
| Intel vPro                                                | Not Available                                                                     | Not Available                                                                     | Not Available                                                                     | Not Available                                            | Not Available                                                   |
| Intel Standard Manageability                              | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Power Optimizer Platform Low-power Management Systems     | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Energy Efficient Ethernet                                 | Supported                                                                         | Supported                                                                         | Supported                                                                         | Not Available                                            | Supported                                                       |
| TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6) | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Receive Side Scaling                                      | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Dual Tx and Rx Queues                                     | Yes                                                                               | Yes                                                                               | Yes                                                                               | Yes                                                      | Yes                                                             |
| Jumbo Frames (up to 9KB)                                  | Supported                                                                         | Supported                                                                         | Supported                                                                         | Not Available                                            | Supported                                                       |
| Teaming                                                   | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Wake from Deep Sx                                         | Supported                                                                         | Supported                                                                         | Supported                                                                         | Not Available                                            | Not Available                                                   |
| Server Operating System Support                           | Windows Server 2008, 2012, 2016, 2019<br>Linux (RHEL/SLES), Free BSD, Xen, Vmware | Windows Server 2008, 2012, 2016, 2019<br>Linux (RHEL/SLES), Free BSD, Xen, Vmware | Windows Server 2008, 2012, 2016, 2019<br>Linux (RHEL/SLES), Free BSD, Xen, Vmware | Windows Server 2003, 2008; RHEL 4, Linux/SLES 11, Vmware | Windows 2008, 2012; RHEL 6.5/7.0, FreeBSD 9/10, Vmware ESXi 5.x |
| Network Proxy/ARP Support                                 | Supported                                                                         | Supported                                                                         | Supported                                                                         | Supported                                                | Supported                                                       |
| Disclaimers                                               |                                                                                   |                                                                                   |                                                                                   |                                                          |                                                                 |

## Ethernet Specifications Group 2 Part 1

|                                          |                                      |                                                                                                                                                                              |                                                                                                             |
|------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Card                                     | Intel Ethernet SFP+ SR Optics Module | Intel Dual Band Wireless-AC 7260 ASM                                                                                                                                         | Intel Winstorm Peak 8265 2x2 AC+BT 4.2 Vpro M.2 Combo                                                       |
| Supplier PN                              | MM#: 941243                          | 7260HMWDTX.R, MM# 936170                                                                                                                                                     | MM#: 946658                                                                                                 |
| Data Rates Supported                     | Not Available                        | Intel Dual Band Wireless-AC 7260                                                                                                                                             | Intel Dual Band Wireless-AC 8265                                                                            |
| Controller Details                       | Not Available                        | Intel Dual Band Wireless-AC 7260, Dual Band, 2x2, WiFi+BT                                                                                                                    | Intel Dual Band Wireless-AC 8265, 2x2, WiFi+BT, MU-MIMO                                                     |
| Controller Bus Architecture              | Not Available                        | PCIe M.2                                                                                                                                                                     | PCIe M.2                                                                                                    |
| Data Transfer Mode                       | Not Available                        | WiFi (802.11ac), 2.4GHz, 5GHz                                                                                                                                                | WiFi (802.11ac), 2.4GHz, 5GHz                                                                               |
| Power Consumption                        | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| IEEE Standards Compliance                | Not Available                        | IEEE 802.11abgn, 802.11ac, 802.11d, 802.11e, 802.11i, 802.11h, 802.11w                                                                                                       | IEEE 802.11abgn, 802.11ac, 802.11d, 802.11e, 802.11i, 802.11h, 802.11w, 802.11r, 802.11k, 802.11v (pending) |
| Boot ROM Support                         | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Network Transfer Mode (Full/Half Duplex) | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Network Transfer Rate                    | Not Available                        | 300/867Mbps                                                                                                                                                                  | 867Mbps                                                                                                     |
| Operating System Driver Support          | Not Available                        | Windows 10, 32-bit*, Windows 10, 64-bit*, Windows 8.1, 32-bit*, Windows 8.1, 64-bit*, Windows 8, 32-bit*, Windows 8, 64-bit*, Windows 7, 32-bit*, Windows 7, 64-bit*, Linux* | Windows 10, 64-bit*, Windows 8.1, 64-bit*, Windows 7, 32-bit*, Windows 7, 64-bit*, Linux*                   |
| Manageability                            | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Manageability Capabilities Alerting      | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| TDP                                      | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Operating Temperature Range              | Not Available                        | 0C to 80C (32F to 176F)                                                                                                                                                      | 0C to 80C (32F to 176F)                                                                                     |
| # of Ports                               | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Data Rate Per Port                       | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| System Interface Type                    | Not Available                        | PCIe M.2                                                                                                                                                                     | PCIe M.2                                                                                                    |
| NC Sideband Interface                    | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Jumbo Frames Supported                   | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| 1000Base-T                               | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| IEEE 1588                                | Not Available                        | Not Available                                                                                                                                                                | Not Available                                                                                               |
| Supported Under vPro                     | Not Available                        | Supported                                                                                                                                                                    | Supported                                                                                                   |
| Disclaimers                              |                                      |                                                                                                                                                                              |                                                                                                             |

## Ethernet Specifications Group 2 Part 2

|                                                           |               |               |
|-----------------------------------------------------------|---------------|---------------|
| Model                                                     | AC 7260 NGW   | AC 8265 NGW   |
| Connector                                                 | 2 x Antennas  | 2 x Antennas  |
| Website                                                   | 7260 NGW      | 8265 NGW      |
| Auto-Negotiation                                          | Not Available | Not Available |
| Intel vPro                                                | Supported     | Supported     |
| Intel Standard Manageability                              | Not Available | Not Available |
| Power Optimizer Platform Low-power Management Systems     | Supported     | Supported     |
| Energy Efficient Ethernet                                 | Not Available | Not Available |
| TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6) | Not Available | Not Available |
| Receive Side Scaling                                      | Not Available | Not Available |
| Dual Tx and Rx Queues                                     | Not Available | Not Available |
| Jumbo Frames (up to 9KB)                                  | Not Available | Not Available |
| Teaming                                                   | Not Available | Not Available |
| Wake from Deep Sx                                         | Not Available | Not Available |
| Server Operating System Support                           | Not Available | Not Available |
| Network Proxy/ARP Support                                 | Not Available | Not Available |
| Disclaimers                                               |               |               |

## Media Card Reader

|             |                  |
|-------------|------------------|
| 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 <ul style="list-style-type: none"><li>- Support Electronic Lock</li><li>- Chassis Intrusion Detection</li><li>- UEFI Secure Boot Support</li><li>- HDD Password Can Protect HDD Data</li><li>- Windows UEFI Firmware Update Support</li><li>- Device Guard Support</li><li>- Optional Access Panel Lock, Kensington Lock, and Pad Lock</li></ul> |

|                                 |                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 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                                                      | 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<br>Universal Serial Bus v2.0<br>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)<br>Products do not contain Asbestos<br>Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide<br>Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation<br>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<br>Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm <sup>2</sup> /week<br>REACH Article 33 information about substances in articles is available at:<br><a href="http://www.lenovo.com/social_responsibility/us/en/ThinkGreen_products.html#environment">http://www.lenovo.com/social_responsibility/us/en/ThinkGreen_products.html#environment</a> |
| 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<br>VCCI Certification for Japan<br>BSMI Certification for Taiwan<br>EU/EFTA CE Mark & DoC<br>UL/CUL(P920,P720,P520,P520c), cTUVus(P330)<br>UL-GS(P920,P720,P520,P520c), TUV-GS(P330)<br>IEC60950-1 CB Report/Certificate<br>Saudi Arabia SASO<br>Kuwait KUCAS<br>China CCC Mark<br>Hong Kong SAR (CB report)<br>Singapore PSB<br>South Africa SABS<br>Russia-EAC<br>Morocco-CM<br>Mexico-NOM |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                 |
|--|-----------------------------------------------------------------------------------------------------------------|
|  | Kazakhstan-EAC<br>Belarus-EAC<br>Serbia KVALITET<br>Ukraine UKrCEPRO<br>India-BIS<br>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)<br>Products do not contain Asbestos<br>Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide<br>Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation<br>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<br>Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm_/week |
| Disclaimers          | EPEAT registered where applicable. EPEAT registration varies by country. See <a href="http://www.epeat.net">www.epeat.net</a> for registration status by country.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |