

# Power Configurator

Lenovo ThinkStation PX



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## Overview

The ThinkStation PX workstation is the first Lenovo workstation in the industry to offer dual power supplies to accommodate the increasing power requirements for newer CPUs and GPUs on the market. The purpose of this document is to provide users with system level power requirements and guidance to maximize configuration components while remaining within the power budget of the system.

# Section 1 – Workplace Preparation



- ! ThinkStation PX may require more power than a traditional desk site provides. It is important to evaluate if your workspace supports the power needed.
- ! A dedicated power circuit is recommended for each power supply.
- ! Enable appropriate outlets and circuits nearby the system location to support the appropriate power cord and amperage required.

Table 1 - PSU Output

Configuration	AC voltage	BIOS mode	Maximum Output power	Maximum continuous AC current (Lowest VAC -5%)
Single or redundant PSUs	200-240	20A	1850 watts	12 amps
Single or redundant PSUs	115-127	20A	1850 watts	20 amps
Single or redundant PSUs	100-110	20A	1400 watts	17 amps
Teamed PSUs	200-240	20A	2350 watts	15 amps
Teamed PSUs	115-127	20A	2350 watts	25 amps
Teamed PSUs	100-110	20A	2350 watts	29 amps

Table 2 - Country Line Voltage Levels

Input Voltage →	100-110VAC	115-127VAC	200-240VAC
<b>Country</b>	Japan	US	EMEA
	Taiwan	Canada	
	Some Caribbean	LA	
		Some Caribbean	
		Venezuela	
		Colombia	
		Ecuador	
		Suriname	
		Panama	
		Costa Rica	
*This is not an exhaustive list, rather intended for high level assessment only.			



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## Section 2 – Key Architecture Design

The ThinkStation PX is the first Lenovo workstation to offer dual power supplies, DDR5 ECC RDIMM memory, and PCIe Gen5 support. The system can operate with just a single power supply (configuration limitations may apply) or have the ability to support redundancy or teamed power supplies through the addition of a second power supply.

PX power supplies install into the back of the chassis and connect to an edge connector on a daughter printed circuit board (PCB) that is connected to the main motherboard. Both power supplies contain an integrated latching mechanism that secures the power supplies inside the chassis.

Due to the increased power handling capabilities of the system, the PX platform utilizes a C19 power cord, as opposed to the more traditional C13 power cords used on previous generations.

See *Figure 1* for an illustration of a C19 power cord.

*Figure 1 - C19 Power Cord Illustration (system side)*



Additionally, the ThinkStation PX provides auxiliary power for PCIe add-in cards via 4 onboard 12VHPWR connectors.

See *Figure 2* for an illustration of the 12VHPWR connector.

*Figure 2 - 12VHPWR Connector*



# Section 3 – Power Ratings for Key System Components

It is important to know the power ratings for various internal components used to fully understand the power capabilities within the ThinkStation PX platform. See *Table 2* for CPU power ratings and *Table 3* for PCIe add-in card ratings.

*Table 3 - CPU Power Ratings*

CPU Name (Xeon Sapphire Rapids)	CPU Power	Additional CPU Information
<b>Platinum 8490H</b>	350W	1.9GHz, 60 cores, 112.5MB Cache, DDR5-4800, Turbo
<b>Platinum 8480+*</b>	350W	2.0GHz, 56 cores, 105MB Cache, DDR5-4800, Turbo
<b>Platinum 8470*</b>	350W	2.0GHz, 52 cores, 105MB Cache, DDR5-4800, Turbo
<b>Platinum 8468</b>	350W	2.1GHz, 48 cores, 105MB Cache, DDR5-4800, Turbo
<b>Platinum 8460Y+*</b>	300W	2.0GHz, 40 cores, 105MB Cache, DDR5-4800, Turbo
<b>Platinum 8452Y*</b>	300W	2.0GHz, 36 cores, 67.5MB Cache, DDR5-4800, Turbo
<b>Gold 6430</b>	270W	2.1GHz, 32 cores, 60MB Cache, DDR5-4400, Turbo
<b>Gold 5420+</b>	205W	2.0GHz, 28 cores, 52.5MB Cache, DDR5-4400, Turbo
<b>Gold 5416S</b>	150W	2.0GHz, 16 cores, 30MB Cache, DDR5-4400, Turbo
<b>Silver 4416+</b>	165W	2.0GHz, 20 cores, 37.5MB Cache, DDR5-4000, Turbo
<b>Silver 4410Y</b>	150W	2.0GHz, 12 cores, 30MB Cache, DDR5-4000, Turbo
<b>Silver 4410T</b>	150W	2.7GHz, 10 cores, 26.25MB Cache, DDR5-4000, Turbo

\*CPU's offered through special bids.

Table 4 - PCIe Add-in Card Power Ratings

Max Power Rating	Card Name	Card Type	Aux Power Connectors on GPU (if any)	Lenovo Aux Power Cables Required (if any)
<b>300W**</b>	RTX A6000 (48GB)	Graphics Card (Dual Slot)	8-pin (EPS)	12VHPWR to EPS 8pin*
<b>230W</b>	RTX A5500 (24GB)	Graphics Card (Dual Slot)	8-pin (PCIe)	12VHPWR to Dual PCIe 8pin*
<b>200W</b>	RTX A4500 (20GB)	Graphics Card (Dual Slot)	8-pin (PCIe)	12VHPWR to Dual PCIe 8pin*
<b>70W</b>	RTX A2000 (12GB)	Graphics Card (Dual Slot)	None	None
<b>75W (or less)</b>	T1000 (8GB) T400 (8GB)	Graphics Card (Single Slot)	None	None
	Quadro Sync II	Graphics Sync Card (Single Slot)	SATA Power	SATA power to 4-pin*
	All Other PCIe Cards	Other PCIe Cards (Single Slot)	None	None

\*See [appendix](#) section for detailed drawing.  
 \*\*The 300W power rating listed on these tables does not apply to the Nvidia RTX 6000 Ada card.

Table 5 - Quantity of Derived Cables

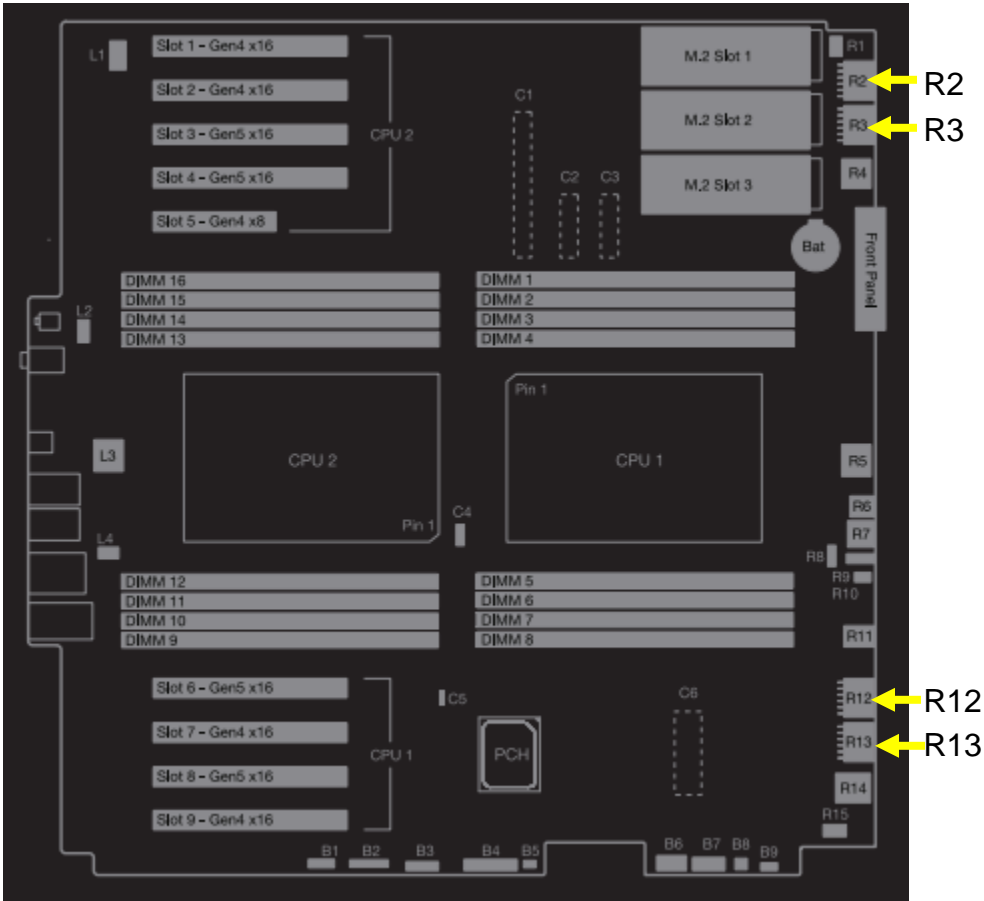
GPU	GPU Quantity	Lenovo Aux Power Cables Derived	
		12VHPWR 2x6+4pin to Dual PCIe 6+2pin, 270mm	12VHPWR 2x6+4pin to CPU 8pin, 270mm
<b>None</b>	0	1	0
<b>RTX A6000 (48GB)</b>	1	1	1
	2	1	2
	3	1	3
	4	0	4
<b>RTX A5500 (24GB) RTX A4500 (20GB)</b>	1	2	N/A
	2	3	
	3	4	
	4	4	
<b>Non-Aux GPUs</b>	Up to 4	1	N/A



Table 6 - Maximum Graphics Power Connectors

Graphics Power Connectors (12VHPWR)	Rating
Graphics Power 1 (R12)	600W
Graphics Power 2 (R13)	450W
Graphics Power 3 (R3)	600W
Graphics Power 4 (R2)	450W
Combined Graphics Power 1+2	750W
Combined Graphics Power 3+4	750W
Combined Graphics Power 1+2+3+4	1500W

Note: Power may be further limited by power supply and system configuration.



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## Section 4 – PX Power Configurations

The ThinkStation PX platform can support up to two (2) 1850W power supplies to allow for some heavy GPU utilization. The following tables, separated by input voltage, show general configuration guidance for allowable CPU and GPU configurations. Please work with the Customer Solutions Team on any configurations that do not appear to be covered in this document!

Select input voltage below to reference the correct section.

- [200-240VAC](#)
- [115-127VAC](#)
- [100-110VAC](#)

## 200-240VAC Input Voltage

Table 7 - Two 1850W PSUs in Team Mode

Supported Configuration for 2x 1850W PSUs (Team Mode)	
GPU	Dual CPUs TDP (W)
	Up to 350W
A6000 (300W)	4
A5500 (230W)	
A4500 (200W)	
A2000 (70W)	
Non-aux (75W)	
<i>Note: Up to 2350W PSU Output.</i>	

Table 8 - One 1850W PSU or two 1850W PSUs in Redundant Mode

Supported Configuration for 1x 1850W PSU or 2x 1850W PSUs (Redundant Mode)												
GPU	Dual CPUs TDP (W)											
	350	330	300	270	250	225	205	185	165	150	145	125
A6000 (300W)	1			2			3					4
A5500 (230W)		2				3					4	
A4500 (200W)	2		3					4				
A2000 (70W)							4					
Non-aux (75W)								4				
<i>Note: Up to 1850W PSU Output.</i>												

## 115-127VAC Input Voltage

Table 9 - Two 1850W PSUs in Team Mode

Supported Configuration for 2x 1850W PSUs (Team Mode)	
GPU	Dual CPUs TDP (W)
	Up to 350W
A6000 (300W)	4
A5500 (230W)	
A4500 (200W)	
A2000 (70W)	
Non-aux (75W)	
<i>Note: Up to 2350W PSU Output.</i>	

Table 10 - One 1850W PSU or Two 1850W PSUs in Redundant Mode

Supported Configuration for 1x 1850W PSU or 2x 1850W PSUs (Redundant Mode)												
GPU	Dual CPUs TDP (W)											
	350	330	300	270	250	225	205	185	165	150	145	125
A6000 (300W)	Not Supported			1	2	3	4		5	6	7	8
A5500 (230W)	Not Supported			1	2	3	4		5	6	7	8
A4500 (200W)	Not Supported		1	2	3		4		5	6	7	8
A2000 (70W)	Not Supported		4		3		2		1		0	
Non-aux (75W)	Not Supported		4		3		2		1		0	
<b>Notes:</b> <ul style="list-style-type: none"> <li>- Up to 1650W PSU Output</li> <li>- Power Cord C19 to NEMA 5-20P</li> </ul>												

## 100-110VAC Input Voltage

Table 11 - Two 1850W PSUs in Team Mode

Supported Configuration for 2x 1850W PSUs (Team Mode)	
GPU	Dual CPUs TDP (W)
	Up to 350W
A6000 (300W)	4
A5500 (230W)	
A4500 (200W)	
A2000 (70W)	
Non-aux (75W)	
<b>Notes:</b> <ul style="list-style-type: none"> <li>- Up to 2350W PSU Output.</li> <li>- Power Cord C19 to NEMA 5-20P</li> </ul>	

Table 12 - One 1850W PSU or Two 1850W PSUs in Redundant Mode

Supported Configuration for 1x 1850W PSU or 2x 1850W PSUs (Redundant Mode)													
GPU	Dual CPUs TDP (W)												
	350	330	300	270	250	225	205	185	165	150	145	125	
A6000 (300W)	Not Supported									1			
A5500 (230W)	Not Supported									1	2		
A4500 (200W)	Not Supported									1	2		3
A2000 (70W)	1			3		4		4					
Non-aux (75W)	Not Supported						4						
<b>Notes:</b> <ul style="list-style-type: none"> <li>- Up to 1400W PSU Output</li> <li>- Power Cord C19 to NEMA 5-20P</li> </ul>													

## Section 5 – PCIe Slot Layout

Since the ThinkStation PX platform introduces PCIe Gen 5 support, it is important to note the capability of each of the PCIe slots within the system.

Table 13 - PCIe Slot Detailed Information

PCIe Slot Number	Slot Width	Slot Length	Generation	Additional Information
<b>PCIe Slot 1</b>	x16	Full	Gen 4	Connected to CPU 2*
<b>PCIe Slot 2</b>	x16	Full	Gen 4	Connected to CPU 2*
<b>PCIe Slot 3</b>	x16	Full	Gen 5	Connected to CPU 2*
<b>PCIe Slot 4</b>	x16	Full	Gen 5	Connected to CPU 2*
<b>PCIe Slot 5</b>	x8, open-ended	Full	Gen4	Connected to CPU 2*
<b>PCIe Slot 6</b>	x16	Full	Gen 5	Connected to CPU 1
<b>PCIe Slot 7</b>	x16	Full	Gen 4	Connected to CPU 1
<b>PCIe Slot 8</b>	x16	Full	Gen 5	Connected to CPU 1
<b>PCIe Slot 9</b>	x16	Full	Gen 4	Connected to CPU 1
<b>M.2 Slot 1</b>	x4	2280 or 22110	Gen 5	Connected to CPU 1
<b>M.2 Slot 2</b>	x4	2280 or 22110	Gen 5	Connected to CPU 1
<b>M.2 Slot 3</b>	x4	2280	Gen 5	Connected to CPU 1

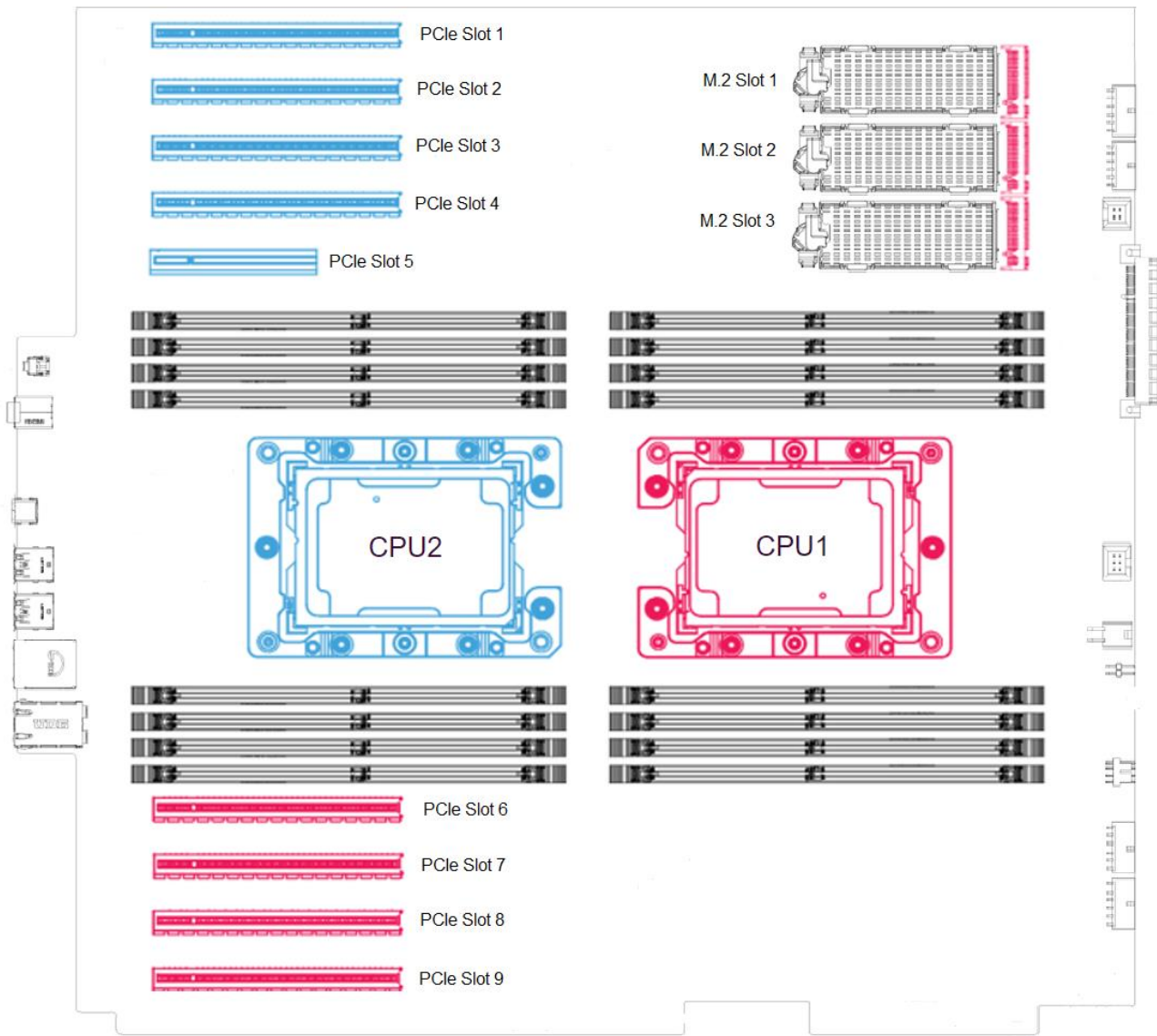
\* Requires dual CPUs to be installed.

Table 14 - PCIe Slot Installation Order

PCIe Slot Order	PCIe Slot Install Priority	Quantity of CPU
1 <sup>st</sup>	PCIe Slot 6	1
2 <sup>nd</sup>	PCIe Slot 8	
3 <sup>rd</sup>	PCIe Slot 7	
4 <sup>th</sup>	PCIe Slot 9	
<b> </b>		
1 <sup>st</sup>	PCIe Slot 6	2
2 <sup>nd</sup>	PCIe Slot 8	
3 <sup>rd</sup>	PCIe Slot 3	
4 <sup>th</sup>	PCIe Slot 1	
5 <sup>th</sup>	PCIe Slot 4	
6 <sup>th</sup>	PCIe Slot 2	
7 <sup>th</sup>	PCIe Slot 7	
8 <sup>th</sup>	PCIe Slot 9	
9 <sup>th</sup>	PCIe Slot 5	



Figure 3 - PX Motherboard Layout





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## Section 6 – Configuration Notes

Due to the complexity of the new ThinkStation PX platform, it is important to note some of the following guidelines and features of the system.

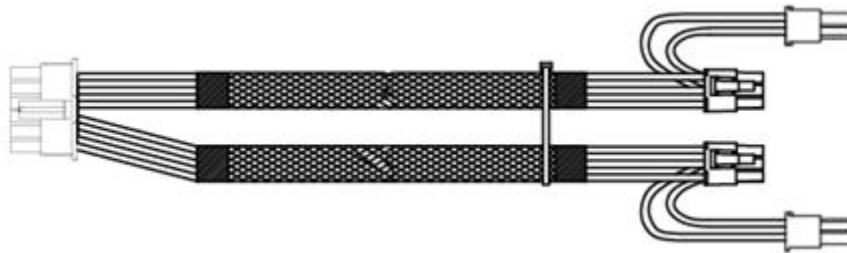
- To utilize PCIe slots 1, 2, 3, 4, and 5, dual CPU's must be installed.
- The 1850W PSU is mechanically unique to the ThinkStation PX chassis and cannot be used in the other platforms.
- The 2<sup>nd</sup> PSU bay is shared with an optional storage bay. If the system is equipped with a 2<sup>nd</sup> PSU, then the optional storage bay is not supported.
- The PSU will automatically operate in a power limited mode if the system input voltage is 100-110V.
- The 300W power rating listed in the tables above does not apply to the Nvidia RTX 6000 Ada card.
- Officially supported configurations could still be limited by additional factors not defined within this document. **Please work with the Customer Solutions Team on any configurations that do not appear to be covered in this document!**

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## Appendix

Here are a few of the auxiliary power cables used in the all new ThinkStation PX platform.

**12VHPWR 2x6+4pin to Dual PCIe 6+2pin, 270mm (FRU# 5C10U58708)**



**12VHPWR 2x6+4pin to CPU 8pin, 270mm (FRU# 5C10U58707)**



**SATA Power to 4-pin for Quadro Sync II Adapter (FRU# 5C10U58668)**



**US Line Cord C19 to NEMA 5-20P**  
FRU# 5L60X67128



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# Revision History

Version	Date	Author	Changes/Updates
1.1	6/5/2023	Jason M.	Removed US Line Cord C19 to NEMA 5-15P.
1.0	5/26/2023	Jason M.	Initial launch release.