THINKSTATION P920/P720/P520/P520C/P330 SUPPORT FOR NVIDIA RTX GPUS

Contents

Overview

One of the key differentiators for workstation class systems is the ability to support high end graphics cards. In recent years, there has been a significantly increased focus on adding more computational power to discrete graphics processing units (GPUs). As such, workstation design has had to evolve as well to keep up with the ever increasing power and thermal requirements of these devices.

The purpose of this document is to highlight some of the details of Nvidia's newest class of GPUs known as RTX (or "Turing" Architecture), and define the level of support for them within the current ThinkStation product lineup. The P920, P720, P520, and P520c platforms all have some level of support for RTX GPUs, but the level of support for each specific card and number of cards will vary by platform.

Section 1 – RTX GPU Overview

The launch of Nivdia's RTX platform based on the Turing Architecture brings with it support for 4 core technologies:

- Ray Tracing – ability to render photorealistic objects in real time using RT cores
- Artificial Intelligence – compute intensive workloads that can benefit from Tensor Cores.
- Rasterization – improvements in the overall graphics pipeline
- Simulation – compute intensive workloads that can benefit from CUDA cores.

More detail can be found about the RTX platform and each of these core technologies on Nvidia's website.

https://www.nvidia.com/en-us/design-visualization/technologies/rtx/

Section 2 – ThinkStation Support for RTX GPUs

The current mainstream ThinkStation product lineup will have some level of support for specific RTX GPUs. The type and number of GPUs that can be supported will obviously vary by platform, so it is critical for ThinkStation customers that wish to utilize the RTX platform to understand the specific level of RTX support for each ThinkStation system.

Figure 1 shows a list of the various RTX GPUs that can be supported within ThinkStation systems.

Figure 1 - List of supported RTX GPUs

	RTX 8000	RTX 6000	RTX 5000	RTX 4000	RTX 2080	RTX 2070
Card Class	Quadro (Enterprise)	Quadro (Enterprise)	Quadro (Enterprise)	Quadro (Enterprise)	GeForce (Consumer)	GeForce (Consumer)
GPU	TU102	TU102	TU104	TU104	TU104	TU106
Memory	48GB GDDR6	24GB GDDR6	16GB GDDR6	8GB GDDR6	8GB GDDR6	8GB GDDR6
CUDA Cores	4608	4608	3072	2304	2944	2304
Tensor Cores	576	576	384	288	368	288
RT Cores	72	72	48	36	46	36
TDP	295W	295W	230W	160W	215W	175W
Power Connectors	1 x 8-pin + 1 x 6-pin	1 x 8-pin + 1 x 6-pin	1 x 8-pin + 1 x 6-pin	1 x 8-pin	1 x 8-pin + 1 x 6-pin	1 x 8-pin
Outputs	4 x DP 1 x USB-C (Virtual Link)	4 x DP 1 x USB-C (Virtual Link)	4 x DP 1 x USB-C (Virtual Link)	3 x DP 1 x USB-C (Virtual Link)	1 x HDMI 3 x DP 1 x USB-C (Virtual Link)	1 x HDMI 3 x DP 1 x USB-C (Virtual Link)

Figure 2 below shows the type and quantity of RTX GPUs that are supported on each of the ThinkStation platforms across the current product lineup (P920, P720, P520, P520c, and P330 Tower).

Figure 2 - Table of RTX GPU Support

	RTX 8000	RTX 6000	RTX 5000	RTX 4000	RTX 2080	RTX 2070
P920	Up to 2[1]	Up to 2[1]	Up to 3[2]	Up to 3	Up to 2[1]	Up to 3[2]
P720 – 900W	Up to 1	Up to 1	Up to 1	Up to 2	Up to 1	Up to 2[3]
P720 – 690W	0	0	0	Up to 1	0	Up to 1[3]
P520 – 900W	Up to 1	Up to 1	Up to 1	Up to 2	Up to 1	Up to 1[3]
P520 – 690W	0	0	Up to 1	Up to 2	Up to 1	Up to 2[3]
P520c	0	0	0	Up to 1	0	Up to 1[4]
P330 Tower – 400W	0	0	0	Up to 1	Up to 1	Up to 1

Note 1 – Requires single 8-pin → 6+6 pin splitter (250mm, female to male, FRU 01YW383) if dual cards selected.

Note 2 – Requires 1 x 8-pin → 6+8 splitter (90mm, female to male, FRU 01YW382) per card for the first 2 GPUs. 3rd GPU (if present) can connect using existing cabling.

Note 3 – Requires 1 x 6-pin → 6+8 pin splitter (200mm, male to male, FRU SC10U58128) for each RTX 2070 card installed in the system.

Note 4 – Requires 1 x 6-pin → 6+8 pin splitter (90mm, female to male, FRU SC10U58127) for each RTX 2070 card installed in the system.
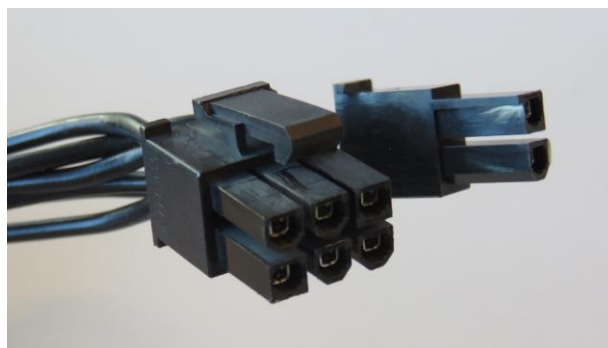
Section 3 – Appendix

This section contains additional useful information about the hardware used to power adapter cards in ThinkStation systems.

STANDARD PCIE POWER CONNECTORS
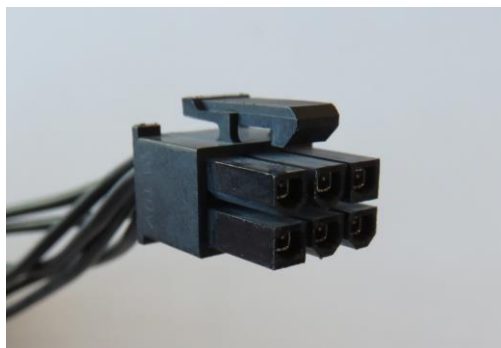
6-pin PCIe Power Connector

6+2 pin (8-pin) PCIe Power Connector

SUPPORTED PCIE POWER CABLE ADAPTERS

FRU 01YW383

8-pin → dual 6-pin splitter, 250mm, female to male

FRU 5C10U58128

6-pin → 6+8 pin splitter, 200mm, male to male

FRU 5C10U58127

6-pin → 6+8 pin splitter, 90mm, Female to male

FRU 01YW382

8-pin →6+8 pin splitter, 90mm, female to male

Section 4 – Revision History

Version	Date	Author	Changes/Updates
1.0	4/18/2018	Cory Chapman	Initial release