PRECISION™7920 TOWER

Technical Guidebook
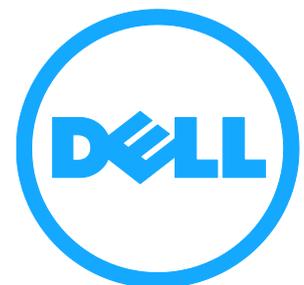
Dell Precision 7920 Tower

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Feb. 2021 Specifications subject to change without notice

7920 TOWER EXTERNAL CHASSIS VIEWS

FRONT VIEW			
1	Power button, power light	6	USB 3.2 Gen 1 Type C port
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3	SD Card Slot	8	Front Bezel Release Latch
4	USB 3.2 Gen 1 Type A ports	9	5.25" ODD Bay (optional)
5	USB 3.2 Gen 1 Type C port (DP/ PowerDelivery)	10	Slimline Optical Bay
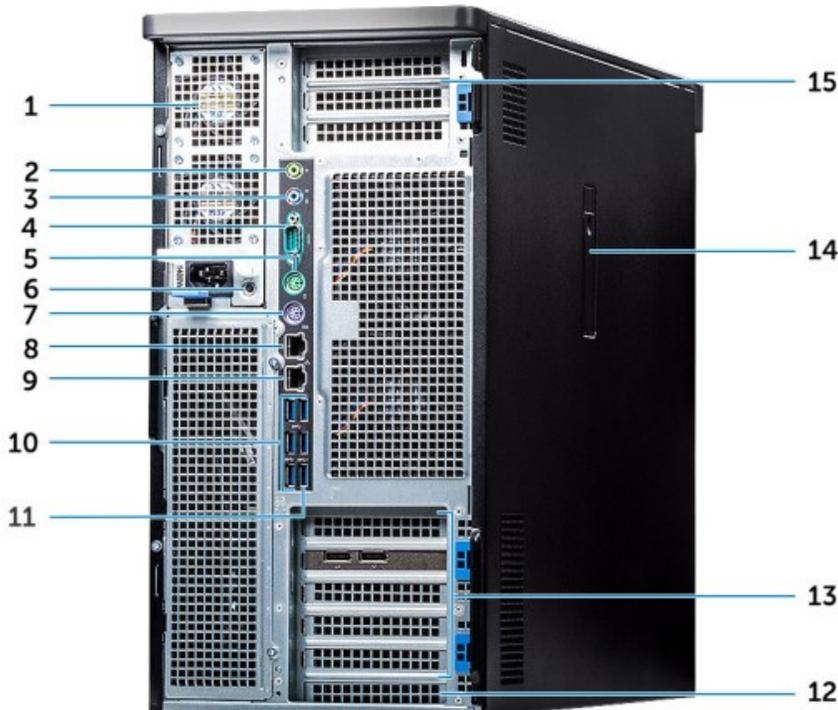
BACK VIEW			
1	Power Supply	9	Network Port
2	Line-Out Port	10	USB 3.2 Gen 1 Type A Ports
3	Microphone/Line-in Port	11	USB 3.2 Gen 1 Type A port (DP/ PowerDelivery)
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5	PS/2 Mouse Port	13	PCIE Expansion Slots
6	PSU BIST	14	Side Cover Release Latch
7	PS/2 Keyboard Port	15	PCIE expansion slots (CPU1 required)
8	Network Port (AMT Enabled—Optional)		

7920 TOWER INTERNAL VIEW
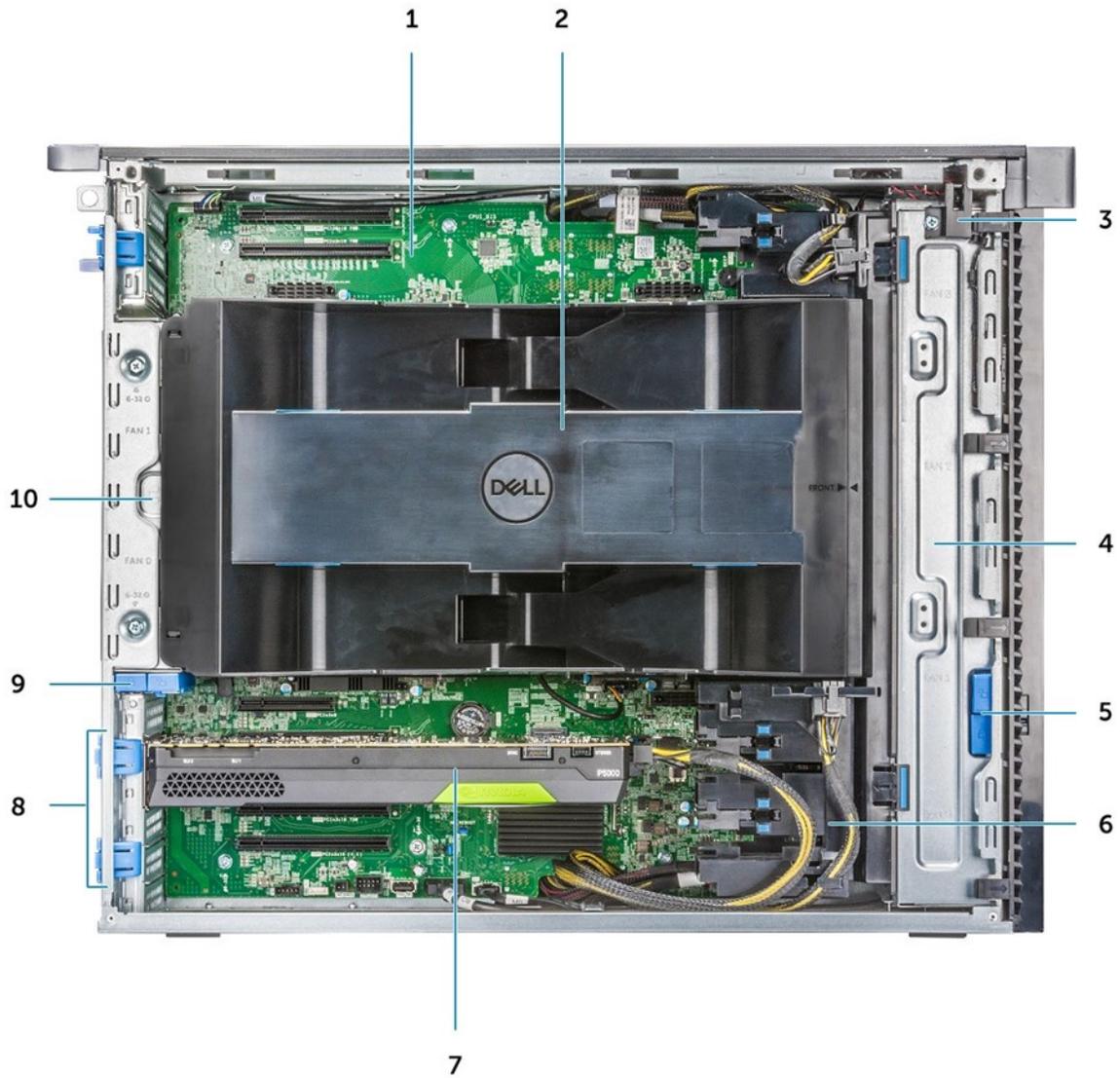
Number	Name	Number	Name
1	System board	6	Auxiliary PCIe power cables
2	CPU and Memory Air shroud	7	Graphics card (GPU) with aux power connector
3	Intrusion switch	8	PCIe card release latches
4	Front system fan assembly	9	Rear HDD Bezel lock/unlock button
5	Front Bezel lock/unlock button	10	Rear Fans

7920 TOWER MOTHERBOARD LAYOUT
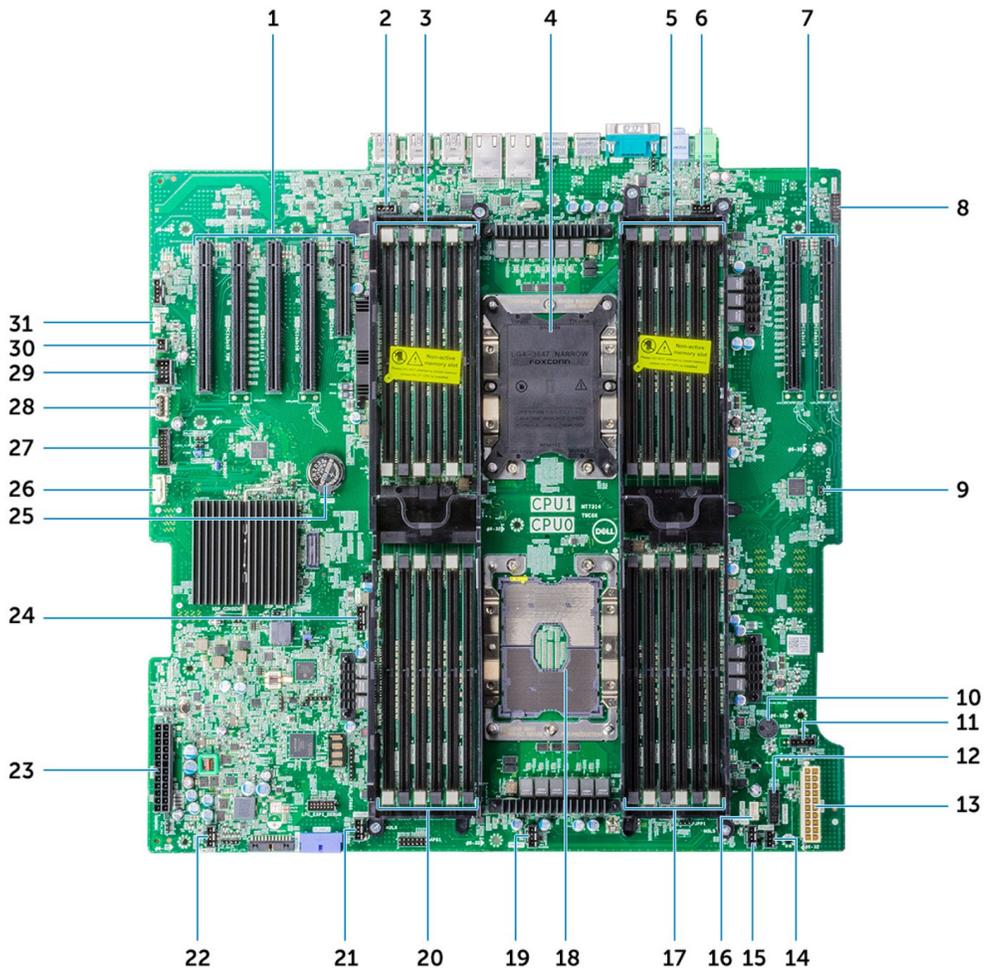
System Board

Number	Name	Number	Name
1	PCIE Gen3 Slots (right to left below)	8	Front Panel Audio connector
	Slot 1—PCIE x8 Gen 3 (Open Ended)	9	N/A
	Slot 2—PCIE x16 Gen 3	10	Piezo Speaker
	Slot 3—PCIE x16 Gen 3 (wired as x1)	11	CPU 0 Fan Connector
	Slot 4—PCIE x16 Gen 3	12	Power Control Connector
	Slot 5—PCIE x16 Gen 3 (wired as x4)	13	Power 2 Fan Connector
2	Rear Fan 0 Connector	14	Intrusion Switch Connector
3	DIMM Slots (available only when optional CPU1 is installed)	15	System Fan 3
4	CPU1 Socket	16	Internal Speaker Connector
5	DIMM Slots (available only when optional CPU1 is installed)	17	DIMM Slots (CPU0)
6	Rear Fan 1 Connector	18	CPU0 Socket
7	PCIE x16 Gen 3 Slots (Slot 6 and 7)	19	System Fan 2

7920 TOWER MOTHERBOARD LAYOUT (CONT.)
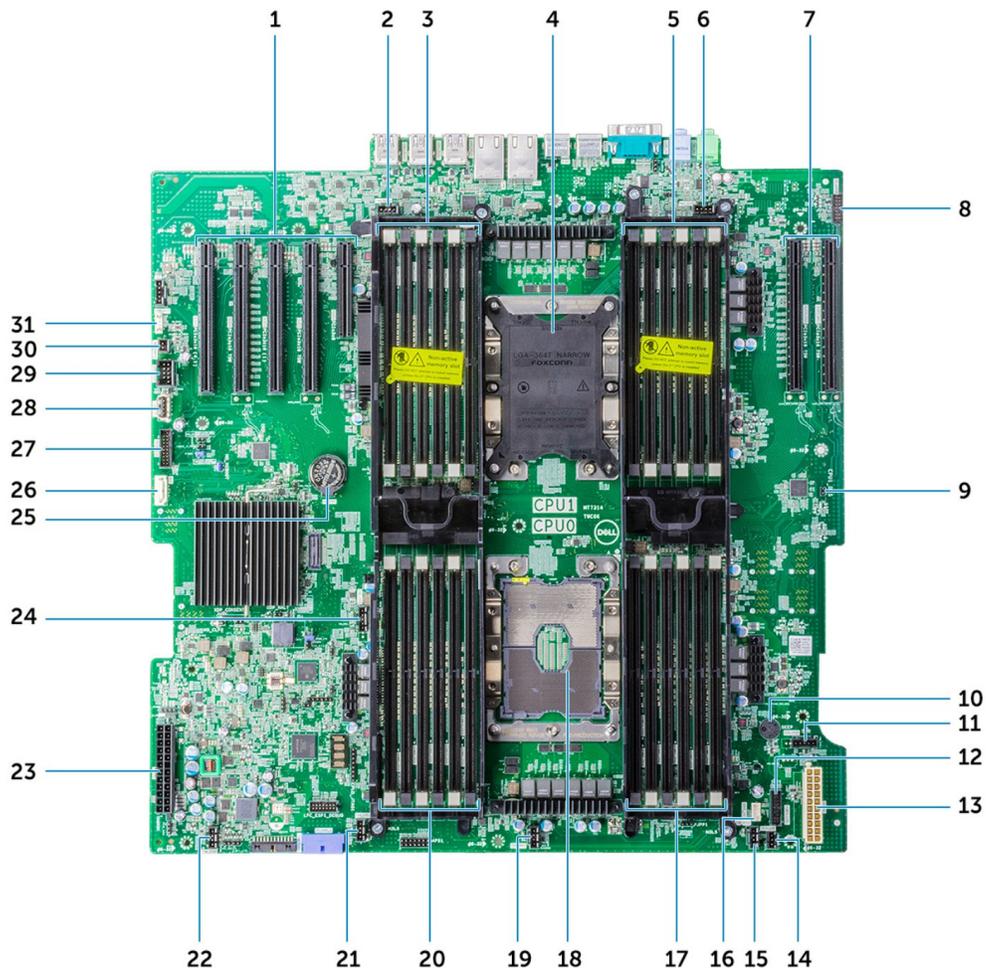
Number	Name	Number	Name
20	DIMM Slots (CPU0)	26	ODD Connector
21	System Fan 1	27	Front Panel USB Connector
22	N/A	28	Internal USB Port (Type A)
23	Power 1 Connector	29	2x5 USB 2.0 header for flex bay. (Requires optional splitter cable to support 2 x USB 2.0 Type A ports)
24	CPU Fan 1 (Mid CPU Fan)	30	Power Remote (Teradici) header
25	Coin Cell Battery	31	Intel vROC® Key (optionally enables PCIe NVMe RAID)

SYSTEM CONFIGURATION OPTIONS

NOTE: Offerings may vary by country. .

Operating Systems

Microsoft® Windows 10® operating system	Factory installed Microsoft® Windows® 10 Pro for Workstations (64 bit)
Microsoft® Windows 7® operating system	Microsoft® Windows 7® Professional (64 bit), EOL
Red Hat® Enterprise Linux® 7.5/8.0	Factory installed RHEL workstation 8.0
Ubuntu 16.04/18.04	18.04 Factory Installed Limited options supported
NeoKylin 6.5	Factory Installed –in China —limited options supported NeoKylin is not offered on 5820 Tower systems with Intel X299 chip-sets

CHIPSET

| Chipset	Intel C621 Chipset (C620 Series)
Non-volatile memory on chipset	
BIOS Configuration SPI (Serial Peripheral Interface)	256Mbit (32MB)
TPM 1.2 Security Device (Trusted Platform Module)[1] TPM 2.0 ships and is supported with Windows 10 only Note: All systems are field upgradable to TPM 2.0 (with firmware & BIOS updates plus Windows 10 Installation http://www.dell.com/support/article/us/en/04/SLN300914	18KB
Non-TPM	Available in select countries
NIC EEPROM	LOM configuration contained within SPI_FLASH – no dedicated LOM EEPROM

INTEL XEON CASCADE LAKE 2ND GEN SCALABLE PROCESSOR FAMILY - SP

Note: Global Standard Products (GSP) are a subset of Dell's relationship products that are managed for availability and synchronized transitions on a worldwide basis. They ensure the same platform is available for purchase globally. This allows customers to reduce the number of configurations managed on a worldwide basis, thereby reducing their costs. They also enable companies to implement global IT standards by locking in specific product configurations worldwide. The following GSP processors identified below will be made available to Dell customers.

Note: Processor numbers are not a measure of performance. Processor availability subject to change and may vary by region/country.

- 3200MHz memory in the 7920 Towers/Rack will not run at that frequency. It will automatically clock down to the maximum frequency supported by the processor which is 2933MHz for Xeon Cascade Lake 82XX Platinum and 62XX Gold processors, 2666MHz with Xeon Cascade Lake Gold 52XX, and 2400MHz and 2133MHz speeds respectively for Silver 42XX and Bronze 32XX processors.

Precision 7820/7920 Towers and 7920 Rack
Intel Xeon® Cascade Lake Scalable Processor Family

Gold — Xeon Gold 52XX
- 2 UPI links @ 10.4GT/s
- DDR4-2666 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/ Turbo Boost

| 5222*ᵈ 4C 3.8-3.9GHz 105W |
| 5220R* 24C 2.2-4.0GHz 150W |
| 5218R* 20C 2.1-4.0GHz 125W |
| 5217* 8C 3.0-3.7GHz 115W |
| 5215 (L)¹ 10C 2.5-3.4GHz 85W |

Silver — Xeon Silver
- 2 UPI links @ 9.6 GT/s
- DDR4-2400 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/ Turbo Boost

| 4216* 16C 2.1-3.2GHz 100W |
| 4215R* 8C 3.2-4.0GHz 130W |
| 4214R* 12C 2.4-3.5GHz 100W |
| 4210R* 10C 2.4-3.2GHz 100W |
| 4208* 8C 2.1-3.2GHz 85W |

Bronze
- Xeon Bronze
- 2 UPI Links @ 9.6 GT/s
- DDR4-2133 RDIMM ECC
- No Turbo/No HT

| 3206R* 8C 1.9GHz 85W |
| 3204* 6C 1.9GHz 85W |

Platinum — Xeon 82XX Platinum
- 3 UPI links @10.4 GT/s
- DDR4-2993 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/Turbo Boost

| 8280 (L)¹ 28C 2.7-4.0GHz 205W |
| 8268* 24C 2.9-3.9GHz 205W |
| 8260* (L)¹ 24C 2.4-3.9GHz 165W |

Gold — Xeon Gold 62XX
- 3 UPI links @10.4 GT/s UPI
- DDR4-2933 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/Turbo Boost

| 6258R* 28C 2.7-4.0GHz 205W |
| 6256*² 12C 3.6-4.5GHz 205W |
| 6254 18C 3.1-4.0GHz 200W |
| 6250*² 8C 3.9-4.4GHz 185W |
| 6248R* 24C 3.0-4.0GHz 205W |
| 6246R* 16C 3.4-4.1GHz 205W |
| 6244* 8C 3.6-4.4GHz 150W |
| 6242R* 20C 3.1-4.1GHz 205W |
| 6240R* 24C 2.4-4.0GHz 165W |
| 6238R 28C 2.2-4.0GHz 165W |
| 6234 8C 3.3-4.0GHz   130W |
| 6230R* 26C 2.1-4.0GHz 150W |
| 6226R* 16C 2.9-3.9GHz 150W |

Jan. 2021

ᵈ 5222 supports memory @ 2933MHz

* GSP CPUs – refer to base SKUs only, not L variants

¹On 7920 Tower/Rack, standard CPUs support up to 1TB of RDIMM memory per CPU. Optional "L" CPU SKUs support up to 1.5TB of RDIMM memory per CPU or 2TB (1 CPU) or 6TB (2 CPUs) with Intel Optane Persistent memory (DCPMM)

²Available on 7920 and 7820 Towers only.

## 7920 TOWER PROCESSORS—INTEL XEON SKYLAKE SCALABLE PROCESSOR FAMILY - SP

Note: Global Standard Products (GSP) are a subset of Dell's relationship products that are managed for availability and synchronized transitions on a worldwide basis. They ensure the same platform is available for purchase globally. This allows customers to reduce the number of configurations managed on a worldwide basis, thereby reducing their costs. They also enable companies to implement global IT standards by locking in specific product configurations worldwide. The following GSP processors identified below will be made available to Dell customers.

Note: Processor numbers are not a measure of performance. Processor availability subject to change and may vary by region/country.

- 2666MHz DDR4 ECC RDIMM/LRDIMM memory will scale down to 2400MHz with Xeon Gold 51XX Series (excluding 5122) and Xeon Silver 41XX Series and down to 2133MHz with Xeon Bronze 31XX Series Processors.
- 2933MHz DDR4 ECC RDIMM memory is not supported with Xeon Skylake SP processors

Precision 7820/7920 Towers and 7920 Rack
Intel Xeon® Skylake Processor Scalable Family - SP

Gold
Xeon Gold 51XX
- 2 UPI links @ 10.4GT/s
- DDR4-2400 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/ Turbo Boost

^{2}5122*
5120*
^{3}5118*

End of Life excluding OEM XL systems

(M)^1 28C 2.5-3.8GHz 205W
8168* 24C 2.7-3.7GHz 205W
(M)^1 24C 2.1-3.7GHz 150W
- Hyper-Threading/Turbo Boost

Silver
Xeon Silver
- 2 UPI links @ 9.6 GT/s
- DDR4-2400 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/ Turbo Boost

4116* 12C 2.1-3.0GHz 85W
4114* 10C 2.2-3.0GHz 85W
4112* 4C 2.6-3.0GHz 85W
4110* 8C 2.1-3.0GHz 85W

Bronze
- Xeon Bronze
- 2 UPI Links @ 9.6 GT/s
- DDR4-2133 RDIMM ECC
- Base GHz- Max Turbo
- No Turbo/No HT

3106* 8C 1.7GHz 85W
3104* 6C 1.7GHz 85W

Gold
Xeon Gold 61XX
- 3 UPI links @10.4 GT/s UPI
- DDR4-2666 RDIMM ECC
- Base GHz- Max Turbo
- Hyper-Threading/Turbo Boost

6154 18C 3.0-3.7GHz 200W
6152 22C 2.1-3.7GHz 140W
^{3}6148* 20C 2.4-3.7GHz 150W
6146 12C 3.2-4.2GHz 165W
6144 8C 3.5-4.2GHz 165W
6140* (M)^1 18C 2.3-3.7GHz 125W
6138 20C 2.0-3.7GHz 125W
6136* 12C 3.0-3.7GHz 150W
6134* (M)^1 8C 3.2-3.7GHz 130W
6130* 16C 2.1-3.7GHz 125W
6128* 6C 3.4-3.7GHz 115W
^{3}6126 12C 2.6-3.7GHz 125W

Notes:
^{1} Standard CPUs support up to 768MB per CPU. Optional "M" SKU CPUs (N/A on 7820) support up to 1.5TB of memory per CPU,
^{2} Xeon 5122 CPU supports memory at 2666MHz
^{3} N/A on 7820 Tower and 7920 Rack

* = GSP CPUs

MEMORY - 2933MHZ AND 3200MHZ

2666MHz and 2933MHz memory RDIMMs have now transitioned to 3200MHz. However 3200MHz memory in the 7920 Tower will not run at that frequency. It will automatically clock down to the maximum frequency supported by the processor which is 2933MHz for Xeon Cascade Lake 82XX Platinum and 62XX Gold processors. With Xeon Cascade Lake Gold 52XX, Silver 42XX and Bronze 32XX processors, memory will clock down to 2666MHz, 2400MHz and 2133MHz speeds respectively. See processor page for details. Note: Precision 7000 system memory SKU descriptions reference 2933MHz or 2666MHz based upon the maximum frequency they can run with Xeon SP Cascade Lake or Sky Lake processors respectively.

Type:	DDR4 SDRAM RDIMM/LRDIMM ECC
Max Frequency	2933MHz
DIMM Slots	24 (12 per CPU)
DIMM Capacities	8GB,16GB, 32GB, 64GB RDIMM, 128GB LRDIMM
Maximum System Memory	3.0TB with 2x "L" CPU SKUs installed)

QUALIFIED MEMORY CONFIGURATIONS:

Note: Not all qualified configurations are necessarily available as standard factory installed options but are possible via CFI or memory customer kits.

7920 Tower Memory with Xeon Cascade Lake SP CPUs

CPU0 columns (left to right): DIMM2, DIMM8, DIMM4, DIMM10, DIMM6, DIMM12, DIMM11, DIMM5, DIMM9, DIMM3, DIMM7, DIMM1 (iMC1: Ch5/Ch4/Ch3; iMC0: Ch0/Ch1/Ch2).
CPU1 columns (left to right): DIMM1, DIMM7, DIMM3, DIMM9, DIMM5, DIMM11, DIMM12, DIMM6, DIMM10, DIMM4, DIMM8, DIMM2 (IMC0: Ch2/Ch1/Ch0; IMC1: Ch3/Ch4/Ch5).

Config	Total (GB)	DPC	Max Running Memory Frequency	Physical Memory Frequency	DIMM2	DIMM8	DIMM4	DIMM10	DIMM6	DIMM12	DIMM11	DIMM5	DIMM9	DIMM3	DIMM7	DIMM1	DIMM1	DIMM7	DIMM3	DIMM9	DIMM5	DIMM11	DIMM12	DIMM6	DIMM10	DIMM4	DIMM8	DIMM2
S8R	8	1DPC	2933	3200												8												
S16R	16	1DPC	2933	3200	8											8												
S32R	32	1DPC	2933	3200	8		8							8		8												
S48R	48	1DPC	2933	3200	8		8		8			8		8		8												
S32Rb	32	1DPC	2933	3200	16											16												
S64R	64	1DPC	2933	3200	16		16							16		16												
S96R	96	1DPC	2933	3200	16		16		16			16		16		16												
S128R	128	2DPC	2933	3200	16	16	16		16		16	16		16	16	16												
S192R	192	1DPC	2933	3200	32		32		32			32		32		32												
S256R	256	2DPC	2933	3200	32	32	32		32		32	32		32	32	32												
S384R	384	1DPC	2933	3200	64		64		64			64		64		64												
S512R	512	2DPC	2933	3200	64	64	64		64		64	64		64	64	64												
D16R	16	1DPC	2933	3200												8	8											
D32R	32	1DPC	2933	3200	8											8	8											8
D64R	64	1DPC	2933	3200	8		8							8		8	8		8							8		8
D96R	96	1DPC	2933	3200	8		8		8			8		8		8	8		8		8			8		8		8
D64R	64	1DPC	2933	3200	16											16	16											16
D128R	128	1DPC	2933	3200	16		16							16		16	16		16							16		16
D192R	192	1DPC	2933	3200	16		16		16			16		16		16	16		16		16			16		16		16
D256R	256	1DPC	2933	3200	32		32							32		32	32		32							32		32
D384R	384	1DPC	2933	3200	32		32		32			32		32		32	32		32		32			32		32		32
D768B	768	1DPC	2933	3200	64		64		64			64		64		64	64		64		64			64		64		64
D128R	128	1DPC	2933	3200												64	64											
D256R	256	1DPC	2933	3200	64											64	64											64
D512R	512	1DPC	2933	3200	64		64							64		64	64		64							64		64
D768R	768	1DPC	2933	3200	64		64		64			64		64		64	64		64		64			64		64		64

MEMORY - 2933MHZ AND 3200MHZ

2666MHz and 2933MHz memory RDIMMs have now transitioned to 3200MHz. However 3200MHz memory in the 7920 Tower will not run at that frequency. It will automatically clock down to the maximum frequency supported by the processor which is 2933MHz for Xeon Cascade Lake 82XX Platinum and 62XX Gold processors. With Xeon Cascade Lake Gold 52XX, Silver 42XX and Bronze 32XX processors, memory will clock down to 2666MHz, 2400MHz and 2133MHz speeds respectively. See processor page for details. Note: Precision 7000 system memory SKU descriptions reference 2933MHz or 2666MHz based upon the maximum frequency they can run with Xeon SP Cascade Lake or Sky Lake processors respectively.

Type:	DDR4 SDRAM RDIMM/LRDIMM ECC
Max Frequency	2933MHz
DIMM Slots	24 (12 per CPU)
DIMM Capacities	8GB, 16GB,32GB 64GB RDIMM, 128GB LRDIMM
Maximum System Memory	3.0TB with 2x "L" CPU SKUs installed)

QUALIFIED MEMORY CONFIGURATIONS:

Note: Not all qualified configurations are necessarily available as standard factory installed options but are possible via CFI or memory customer kits.

7920 Tower Memory with Xeon Cascade Lake SP CPUs

CPU0: iMC1 [Ch5 (0,1), Ch4 (0,1), Ch3 (0,1)], iMC0 [Ch0 (1,0), Ch1 (1,0), Ch2 (1,0)]
CPU1: iMC0 [Ch2 (0,1), Ch1 (0,1), Ch0 (0,1)], iMC1 [Ch3 (1,0), Ch4 (1,0), Ch5 (1,0)]

Config	Total (GB)	DPC	Max Running Memory Frequency	Physical Memory Frequency	DIMM2	DIMM8	DIMM4	DIMM10	DIMM6	DIMM12	DIMM11	DIMM5	DIMM9	DIMM3	DIMM7	DIMM1	DIMM1	DIMM7	DIMM3	DIMM9	DIMM5	DIMM11	DIMM12	DIMM6	DIMM10	DIMM4	DIMM8	DIMM2
S512LR	512	1DPC	2933	3200	128		128							128		128												
S768LR	768	1DPC	2933	3200	128		128		128		128			128		128												
S1024LR	1024	2DPC	2933	3200	128	128	128		128		128			128	128	128												
S1536LR	1536	2DPC	2933	3200	128	128	128	128	128	128	128	128	128	128	128	128												
D256LR	256	1DPC	2933	3200												128												128
D512LR	512	1DPC	2933	3200	128											128	128											128
D1024LR	1024	1DPC	2933	3200	128		128							128		128	128		128							128		128
D1536LR	1536	1DPC	2933	3200	128		128		128		128			128		128	128		128		128		128			128		128
D2048LR	2048	2DPC	2933	3200	128	128	128		128		128			128	128	128	128	128	128		128		128			128	128	128
D3072LR	3072	2DPC	2933	3200	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
S64R	64	2DPC	2933	3200	8	8	8		8			8		8	8	8												
S96R	96	2DPC	2933	3200	8	8	8	8	8	8	8	8	8	8	8	8												
S128R	128	2DPC	2933	3200	16	16	16		16			16		16	16	16												
S192R	192	2DPC	2933	3200	16	16	16	16	16	16	16	16	16	16	16	16												
S256R	256	2DPC	2933	3200	32	32	32		32			32		32	32	32												
S384R	384	2DPC	2933	3200	32	32	32	32	32	32	32	32	32	32	32	32												
S512R	512	2DPC	2933	3200	64	64	64		64			64		64	64	64												
D128R	128	2DPC	2933	3200	8	8	8		8			8		8	8	8	8	8	8		8			8		8	8	8
D192R	192	2DPC	2933	3200	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
D256R	256	2DPC	2933	3200	16	16	16		16			16		16	16	16	16	16	16		16			16		16	16	16
D384R	384	2DPC	2933	3200	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
D512R	512	2DPC	2933	3200	32	32	32		32			32		32	32	32	32	32	32		32			32		32	32	32
D768R	768	2DPC	2933	3200	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

MEMORY - INTEL OPTANE DC PERSISTENT MEMORY 2666MHZ (MEMORY MODE)

Intel Optane DC Persistent Memory is offered with select Xeon Cascade Lake processors. It runs at 2666MHz and requires standard RDIMM memory as cache— which is not included in overall memory capacity. Intel DCPMM is supported in memory mode only on the Precision 7920 Tower and is not "Persistent" in memory mode.

Note: 2666MHz RDIMM memory used as cache in Optane DC Persistent Memory configs has transitioned to 3200MHz RDIMM memory as part of an industry transition. However the 3200MHz memory will automatically clock down to a maximum of 2666MHz.

Type:	Intel Optane DC Persistent Memory modules
Max Frequency	2666MHz
DCPMM Capacities	128GB, 256GB, 512GB
Maximum Memory with DCPMM	1.5TB with1 CPU, up to 6.0TB with 2 CPUs ("L" SKUs)

| 7920 Tower Intel Optane DCPMM			CPU0												CPU1												
			iMC1						iMC0						IMC0						IMC1						
			Ch5		Ch4		Ch3		Ch0		Ch1		Ch2		Ch5		Ch4		Ch3		Ch0		Ch1		Ch2		
			0	1	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0
DDR4 Cache (GB)	Total Memory AEP (GB)	DPC	DIMM2	DIMM8	DIMM4	DIMM10	DIMM6	DIMM12	DIMM11	DIMM5	DIMM9	DIMM3	DIMM7	DIMM1	DIMM1	DIMM7	DIMM3	DIMM9	DIMM5	DIMM11	DIMM12	DIMM6	DIMM10	DIMM4	DIMM8	DIMM2
64	256	111	128		16		16			16		16		128												
96	512	221	16	128	16	128	16			16	128	16	128	16												
192	1024	221	32	256	32	256	32			32	256	32	256	32												
192	2048	221	32	512	32	512	32			32	512	32	512	32												
96	768	222	16	128	16	128	16	128	128	16	128	16	128	16												
192	1536	222	32	256	32	256	32	256	256	32	256	32	256	32												
128	512	111	128		16		16			16		16		128	128		16		16			16		16		128
256	2048	111	512		32		32			32		32		512	512		32		32			32		32		512
192	1024	221	16	128	16	128	16			16	128	16	128	16	16	128	16	128	16			16	128	16	128	16
384	2048	221	32	256	32	256	32			32	256	32	256	32	32	256	32	256	32			32	256	32	256	32
768	4096	221	64	512	64	512	64			64	512	64	512	64	64	512	64	512	64			64	512	64	512	64
192	1536	222	16	128	16	128	16	128	128	16	128	16	128	16	16	128	16	128	16	128	128	16	128	16	128	16
384	3072	222	32	256	32	256	32	256	256	32	256	32	256	32	32	256	32	256	32	256	256	32	256	32	256	32
768	3072	222	64	256	64	256	64	256	256	64	256	64	256	64	64	256	64	256	64	256	256	64	256	64	256	64
1536	6144	222	128	512	128	512	128	512	512	128	512	128	512	128	128	512	128	512	128	512	512	128	512	128	512	128

7920 TOWER FLEXBAY STORAGE

7920 Tower – FlexBay Options

- **FlexBay 0 and 1**
  - Default SATA/SAS FlexBays each support 2x 2.5" or 3.5" SATA/SAS HDDs with appropriate controllers up to 4 drives (1-4)
  - Optional PCIe backplane FlexBays can support M.2 (M.2 module/carrier) or U.2 2.5" PCIe NVMe SSDs with hot swap up to 4 drives with dual CPUs & Intel controller or MegaRAID NVMe controller (single or dual CPU)
    - FlexBay 1 is default for 1st and 2nd M.2/U.2 PCIe NVMe SSDs

- **FlexBay 2** is a 5.25" bay for HH Optical Drives & converts to support 9th and 10th SATA/SAS drives with MegaRAID 9460-16i
  - In that config the slimline bay goes away

- **Slimline** bay supports**:**
  - Slimline Optical drive or CAC/PIV Smart Card Reader

- **FlexBay 3 and 4** (rear storage) are optional and can only contain SATA/SAS) HDDs/SSDs
  - They are populated with drives 5-8 **when** that option is chosen in the **Additional Storage** module positioned before 5th HDD module
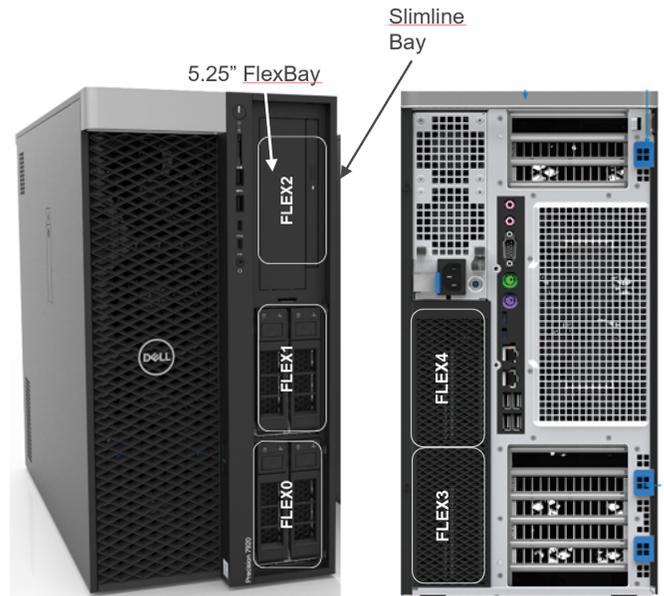
Additional Storage (201*)

No Additional Storage

- ⦿ No Additional Storage[NOADSTO] [Included in Price]
- ◯ Choose to add 5th-8th SATA Drives to Rear FlexBays with Integrated Intel Controller[4XHDDMB] [Add $119.00]
- ◯ Choose to add 5th-8th SATA/SAS Drives to Rear FlexBays with Broadcom Controller[4XHDLSI] [Add $119.00]

Slimline Bay

5.25" FlexBay

FLEX2

FLEX1

FLEX0

FLEX4

FLEX3

CAC/PIV Card Reader

Externally tool-less removable PSUs - lockable

Rear FlexBays for up to 4 drives

M.2/U.2 NVMe PCIe SSD Hot swappable

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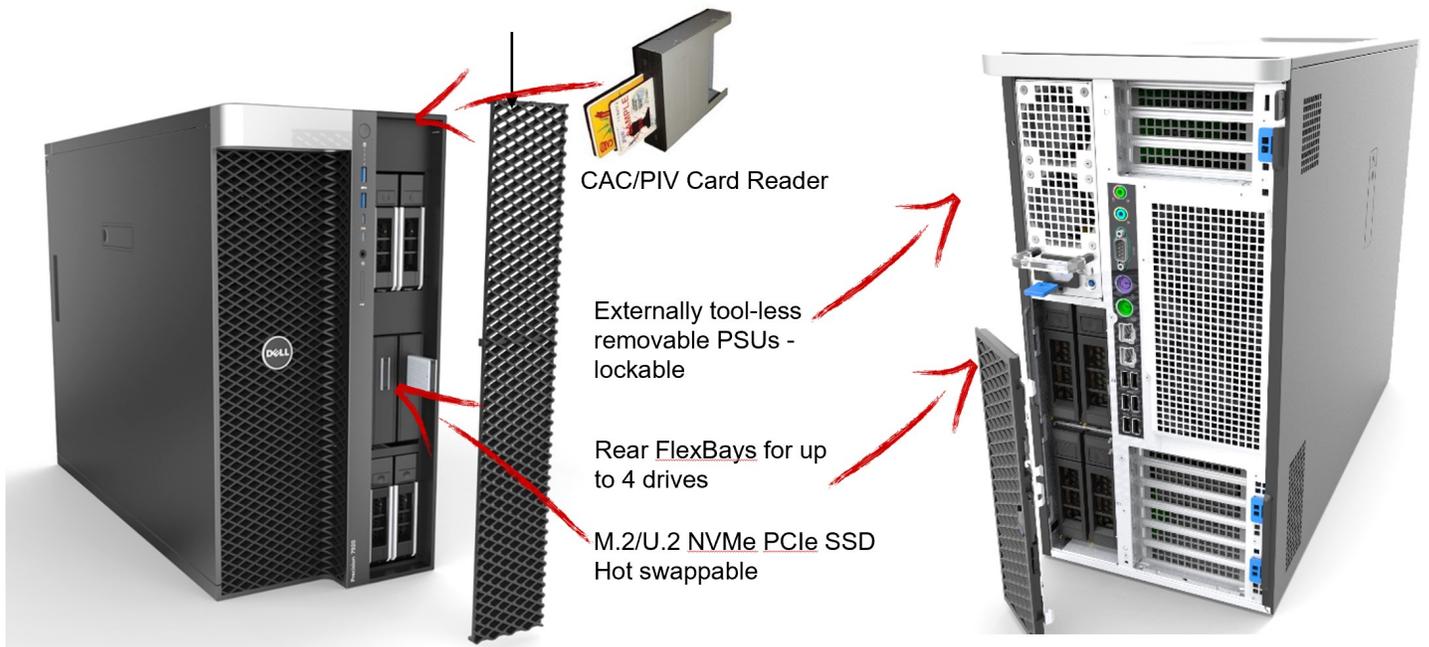
[1]The total amount of available memory will be less than 4GB on systems running 32-bit operating systems. The amount less depends on the actual system configuration. To fully utilize 4GB or more of memory requires a 64-bit operating system.

7920 TOWER - CONFIGURING STORAGE

7920 Tower Storage Configuration Path & NVMe options

OS Boot Drive	→	CONTROLLER Module	→	1st HDD	→	2nd- 4th HDD

OS Boot Drive
Intel PCIe SSD (Front FlexBay)
Internal PCIe SSD (Dell Ultra-Speed Drive)
MegaRAID 9460 NVMe (front FB)
SATA/SAS HDD/SSD
SATA/SAS HDD/SSD RAID

CONTROLLER Module
Intel Integrated SATA
MegaRAID 9440-8i w SATA/SAS
MegaRAID 9460-16i HW RAID w SATA/SAS
Intel Integrated (RST-e) w 1-2 Front NVMe
Intel Integrated (RST-e) w 3-4 Front NVMe
MegaRAID 9460 NVME w 1-4 Front NVMe

1st HDD
SATA/SAS HDD
SATA/SAS SSD
Front M.2 NVMe PCIe SSD
No Hard Drive

2nd- 4th HDD
SATA/SAS HDD
SATA/SAS SSD
Front M.2 NVMe PCIe SSD
No Hard Drive

Additional Storage	→	5th -8th HDD in Rear FlexBay	→	9th -10th HDD in 5.25" bay	→	RAID SATA/SAS & Front NVMe

Additional Storage
No additional Storage
Choose to add 5th-8th SATA Drives to Rear FlexBays w Intel controller
Choose to add 5th-8th SATA/SAS Drives to Rear FlexBays w MegaRAID controllers

5th -8th HDD in Rear FlexBay
SATA/SAS HDD
SATA/SAS SSD
No Hard Drive

9th -10th HDD in 5.25" bay
SATA/SAS HDD
SATA/SAS SSD

RAID SATA/SAS & Front NVMe

SATA/SAS	Intel	9460 NVMe
RAID 0	RAID 0	RAID 0
RAID 1	RAID 1	RAID 1
RAID 5		RAID 5
RAID 10		RAID 10

.

Ultra-Speed Drive M.2 PCIe NVMe SSD	Ultra-Speed Drive RAID (Intel vROC)	2nd Ultra-Speed Drive M.2 PCIe NVMe SSD

Ultra-Speed Drive M.2 PCIe NVMe SSD
Duo Drive 1-2 M.2 PCIe Class 40/50 SSD
Quad Drive 1-4 M.2 PCIe Class 40/50 SSD

Ultra-Speed Drive RAID (Intel vROC)

Duo	Quad
RAID 0	RAID 0
RAID 1	RAID 1
	RAID 10
	Boot + RAID 0
	Boot + RAID1

2nd Ultra-Speed Drive M.2 PCIe NVMe SSD
7920 Tower and Rack w Dual CPUs
Quad Drive 1-4 M.2 PCIe Class 40/50 SSD

GRAPHICS

NOTE: The system supports full height (FH) cards. Up to 4 single wide or 3 double wide graphics cards (excluding the 3080/3090 graphics cards) can be supported with the 2nd CPU installed (adds two additional single width PCIe Gen 3.0 x16 slots). **Some dual and triple RTX graphics card configurations require 220V AC supply/line cord in 100-120V countries like the U.S. Canada and Japan**

Precision systems ship out of the factory with PCIe AUX graphics power connectors (dongles) as needed for the supported graphics cards. NOTE: Dual Graphics with NVIDIA NVLink and SLI (Scalable Link Interface) options available with select cards.

Graphics Options	
High End 3D Cards	
Options	Graphics card PCIe AUX power connectors/dongles
Radeon Pro W5700	1x 8 pin 1x 6 pin
Radeon Pro WX 9100 - EOL	1x 8 pin 1x 6 pin
NVIDIA Quadro GV100	1x 8 pin
NVIDIA Quadro RTX 8000	1x 8 pin 1x 6 pin
NVIDIA Quadro RTX 6000	1x 8 pin 1x 6 pin
NVIDIA Quadro RTX 5000	1x 8 pin 1x 6 pin
Nvidia Consumer Graphics Cards	
NVIDIA GeForce RTX 3090 – Maximum 1 card	2x 8pin
NVIDIA GeForce RTX 3080 – Maximum 1 card	2x 8pin
Mid-range 3D Cards	
Options	Graphics card PCIe AUX power inputs
Radeon Pro W5500	1x 6 pin
Radeon Pro WX 7100	1x 6 pin
Radeon Pro WX 5100	
Radeon Pro WX 3200	
NVIDIA Quadro RTX 4000	1x 8 pin
NVIDIA Quadro P2200	
Entry 3D Cards	
Options	Graphics card PCIe AUX power inputs
NVIDIA Quadro P620	
NVIDIA Quadro P400	
Professional 2D Cards	

BAYS, DRIVES AND OPTICAL STORAGE OPTIONS

BAYS:	
2x front FlexBays (0,1) support 2 drives each (tot. 4 drives) Convertible 5.25" front FlexBay (2) can support 1x 3.5" or 2x 2.5" drives Optional 2 rear FlexBays (4,5) can support up to 4x 3.5" or 2.5" drives	FlexBays can support 2.5" or 3.5" drives Standard (non PCIe backplane) systems ship with all 4 drive bays populated with sleds/carriers that support 2.5" or 3.5" drives. Empty 2nd bay on PCIe backplane systems have standard sleds. FlexBays 0 and 1 (with PCIe backplanes) can support up to 4x M.2 (M.2 module/carrier) or U.2 PCIe NVMe SSDs
Maximum 2.5"/3.5"Hard Drives/SSDs supported	10x 2.5" or 3.5" with MegaRAID 9460-16i controller. Slimline bay is not available with 9 or 10 drives installed
Maximum front FlexBay M.2/U.2 PCIe NVMe SSDs supported	Up to 4x drives with integrated Intel controller and two CPUs Up to 4x drives with MegaRAID 9460 NVMe controller option
Internal M.2 PCIe NVMe SSDs supported on Dell Ultra-Speed Drive PCIe cards	Up to 8x on two cards with dual CPUs
Slimline Bay	1x - supports slimline optical or CAC/PIV Card Reader Not available with 9x or 10x hard drives populated
Optical Drives Supported	1x slimline, or 1x HH in 5.25" FlexBay 2
DRIVES:	
3.5" Hard Drives:	
3.5" 4TB SAS 7200 RPM nearline HDD	X
3.5" 12TB 7200 RPM SATA Enterprise HDD	X
3.5" 8TB 7200 RPM SATA Enterprise HDD	X
3.5" 4TB 7200 RPM SATA Enterprise HDD	X
3.5" 2TB SATA 7200 RPM HDD	X
3.5" 1TB SATA 7200 RPM HDD	X
2.5" HARD DRIVES:	
2.5" 500GB SATA 7200 RPM HDD	X
2.5" 900GB SAS 12Gb/s 15K RPM HDD	X
2.5" 600GB SAS 12Gb/s 15K RPM HDD	X
2.5" 300GB SAS 12Gb/s 15K RPM HDD	X

OPTICAL DRIVES:	
Slimline DVD+/-RW[1] SATA 1.5Gbit/s	X
Slimline DVD-ROM[1] SATA 1.5Gbit/s	X
Half height BD-RE SATA - EOL June 2021	X
5.25" DVD+/-RW[1] SATA 1.5Gbit/s	X
MEDIA CARD READER:	
Front panel—integrated SD card reader	X

[1] Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R media provides maximum compatibility.
[2] DVD-ROM drives may have write-capable hardware that has been disabled via firmware modifications.

SOLID STATE DRIVES

2.5" SATA SSDs:	
2.5" 1.92TB SATA Enterprise Class Solid State Drive	X
2.5" 500GB SATA Class 20 Solid State Drive	X
2.5" 256GB SATA Class 20 Solid State Drive	X
M.2 PCIe NVMe PCIe SSDs	
M.2 1TB PCIe NVMe Class 50 Solid State Drive	X
M.2 512GB PCIe NVMe Class 50 Solid State Drive	X
M.2 2TB PCIe NVMe Class 40 Solid State Drive	X
M.2 1TB PCIe NVMe Class 40 Solid State Drive	X
M.2 512GB PCIe NVMe Class 40 Solid State Drive	X
M.2 256G PCIe NVMe Class 40 Solid State Drive	X
M.2 1TB PCIe NVMe Class 40 SED Solid State Drive	X
M.2 512GB PCIe NVMe Class 40 SED Solid State Drive	X

U.2 PCIe NVMe PCIe SSDs	
U.2 Intel® Optane™ SSD 905P 960GB PCIe NVMe Solid State Drive	X
U.2 Intel® Optane™ SSD 905P 280GB PCIe NVMe Solid State Drive	X

Dell SSD classifications

	Class	Sequential* Read/Write IOmeter (MBPS)	Random** Read/Write IOmeter (KIOPS)	Interface
SATA	20 "mainstream"	487 / 425	91 / 58	SATA Interface full feature set **Consumer, Commercial**
PCIe	40 "performance"	1091 / 587	220 / 132	PCIe interface NVMe host protocol **Consumer, Commercial Performance**
	50 "performance"	1523 / 1116	300 / 247	Best in class PCIe NVMe **Precision Only**

Based on Dell internal testing, July 2017, using IOMeter. Actual performance will vary with configuration, usage and manufacturing variability."

Note: Capacity 512GB, typical values, results may vary

*Sequential = boot, hibernate, daily power up and power down functions

**Random = random tasks such as file search

DELL PRECISION ULTRA-SPEED DUO AND QUAD DRIVES

Dell Precision Ultra-Speed Drive Specifications

	Duo	Quad
Configuration:		
On-board M.2 Slots	2	4
NAND Type	Class 40 Minimum	
M.2 Capacity Options	256GB, 512GB, 1TB, 2TB	
Maximum Capacity	2x 2TB	4x 2TB
System Requirements:		
System Board Connection	PCIe Gen3 X8	PCIe Gen3 X16
Form Factor	HHHL	FHFL
OS	Win 7, Win 10; RHEL, Ubuntu 18.04	
Supported Platforms	5820, 7820, 7920 Towers 7920 Rack	
Performance*		
Sequential Reads	At least 1500	
Sequential Writes	At least 350K	
SPECwpc Storage General Ops.	Up to 123	
Endurance		
Terabytes Written (TBW)	Up to 72	
MTBF	800,000 Hours	
Physical		
Weight (Single M.2 Populated)	.242 lbs. (110g)	.484 lbs. (220g)
Dimensions (HWD)	167.65mm x 69.56mm x 17.77mm	240mm x 111.15mm x 19.23mm
Operating Temperature Range	50-95F (10-35C)	
Airflow	3.5 CFM	12 CFM
Certifications	UL, CE, RoHS	

Storage Reliability & Endurance Summary – CY2018

Category	Capacity	SATA HDD	SATA Mainstream Class 20	SATA Performance Class 30	PCIe NVME Mainstream Class 35/40	PCIe NVMe Performance Class 50
SSD Endurance (TBW)	128GB		72			
	256GB		75	150	75	150
	512GB		150	300	150	300
	1TB		300		300	600
	2TB				300	
Reliability (MTBF hours)	All SSD		1,400,000			
	ALL HDD	550,000				

Endurance is a measure of SSD life , how much data can be written for how long – measured in Terabytes Written, TBW, our SSD's are specified for TBW over a 5 year lifecycle
Reliability is measured in Mean Time Between Failures , MTBF units = hours   Values shown are minimum required – Dell Internal Engineering Specification.

SYSTEM EXPANSION SLOTS

NOTE: See Detailed Engineering Specifications for supported voltage, maximum wattage and card dimensions.

All PCIe slots are PCIe Gen 3 and Full height/Full length

PCIe x16 Slot Gen 3	2 Slots - (slots 1-2, 1-4), 2 slots (slots 2-1, 2-2 with 2nd CPU) 4 slots total with 2nd CPU installed
PCIe x16 (wired x8—open ended)	1 (Slot 1)
PCIe x16 Slot (wired x4)	1 (Slot 5)
PCIe x16 Slot (wired x1)	1 Slot 3)
SATA connectors for hard drives and optical drives	8 SATA @6Gb/s plus 1 for optical with Intel controller

7920 Tower Slot Layout

PCIe x16	**CPU2 Slot 7** (with 2nd CPU)
PCIe x16	**CPU2 Slot 6** (with 2nd CPU)
	CPU2 – Mechanical Slot

PCIe x8 (open-ended slot)	**Slot 1**
PCIe x16	**Slot 2** – Default for Factory Installed graphics card
PCIe x1 (x16 slot)	**Slot 3**
PCIe x16	**Slot 4** – Second graphics card
PCIe x4 (x16 slot)	**Slot 5**
	Mechanical Slot

Slots covered when dual-wide graphics card(s) are installed
Note – no PCI slot
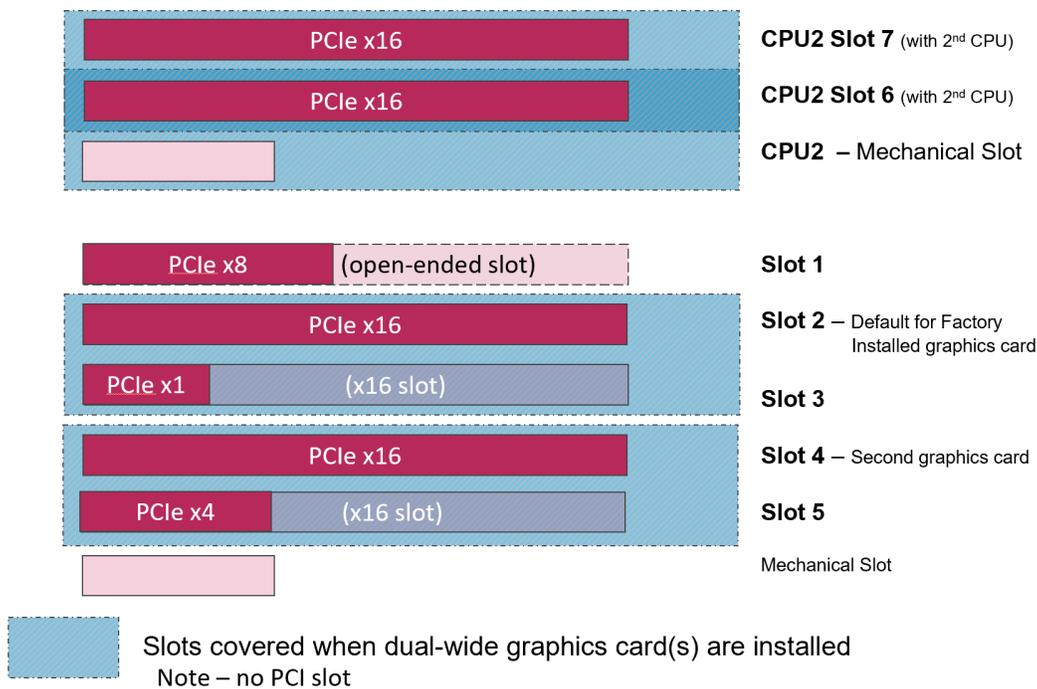
EXTERNAL PORTS/CONNECTORS

NOTE: See chassis diagrams section for port/connector locations

USB 3.1	**Front:** 2x USB 3.1 Gen 1 Type A, 2x USB 3.1 Gen 1 Type C **Rear:** 6x USB 3.1 Gen1 Type A **Optional:** 2 x USB 3.1 Gen 2 Type C on PCIe card
USB 2.0	**Internal:** 1x USB 2.0 plus 1x 2x5 USB 2.0 header for flex bay. (Requires 3rd party splitter cable to support 2x USB 2.0 Type A ports)
Serial	1 Rear
Network Connector (RJ-45)	2 Rear
PS/2	2 Rear
Audio:	
Universal Audio Jack	1 Front
Audio Line out	1 Rear
Audio Line in/Microphone	1 Rear

SYSTEM EXPANSION SLOTS AVAILABLE WITH NVIDIA GEFORCE RTX 3080/3090 GRAPHICS

NOTE: See Detailed Engineering Specifications for supported voltage, maximum wattage and card dimensions.

7920 Tower Slot Layout with 3080/3090 Graphics - March 2021

CPU2 **Slot 7** (with 2nd CPU)

CPU2 **Slot 6** (with 2nd CPU)

CPU2 – Mechanical Slot

Slot 1 — PCIe x8 / Filler (open-ended slot) — No gap

Slot 2 — PCIe x16

Slot 3 — PCIe x1 (x16 slot)

3080/3090 in Slot 2
Max 1 card incl. with Dual CPUs

Slot 4 — PCIe x16

Slot 5 — PCIe x4 (x16 slot)

Mechanical Slot 6

Slots covered when 3080/3090 graphics card is installed in Slot 2
   - Only PCIe x4 slot 5 remains eliminating Ultra-Speed Duo/Quad
   & Broadcom MegaRAID cards in single CPU systems (Duo/Quad OK in dual CPU systems)
   - Add NVMe drives via front FlexBay options

Slots covered when dual-wide graphics card(s) are installed
Note: no PCI slot

HARD DRIVE CONTROLLERS

Integrated Intel® Chipset SATA controller (6Gb/s) controller supports SATA software RAID 0 1, 5, 10. Intel® vROC software RAID option (motherboard activation key) supports software RAID 0, 1, 10 with PCIe NVMe SSDs	Base controller supports up to 8 SATA ports plus 1 for optical vROC Option is available at point of sale or as a customer kit
Broadcom MegaRAID® 9440-8i SAS 12Gb/s (SATA 6Gb/s) controller with 8 ports, supports software RAID 0, 1, 5, 10.	Optional PCIe x8 card supports up to 8 SAS or SATA drives
Broadcom MegaRAID® 9460-16i SAS 12Gb/s (SATA 6Gb/s) controller with 4GB cache memory with Flash module/Super Cap backup. Hardware based RAID 0, 1, 5, 10.	Optional PCIe x8 card supports up to 10 SAS or SATA drives **NVMe** option supports up to 4x front FlexBay M.2/U.2 PCIe NVMe SSDs including Intel Optane U.2 905P SSDs

COMMUNICATIONS - NETWORK

Intel® i219 Gigabit Ethernet LAN 10/100/1000[1]	Integrated on system board
Intel® I210 Gigabit Ethernet LAN Adapter 10/100/1000[1]	Integrated on system board
Intel® I210-T1 Gigabit Ethernet LAN Adapter 10/100/1000[1]	Optional PCIe x1 card
Intel® X550-T2 10GbE Ethernet Server Adapter[1]	Optional PCIe x4 card
Aquantia AQN-108 2.5Gbit/5Gbit single port Ethernet Adapter	Optional PCIe x4 card

[1] This term does not connote an actual operating speed of 1 or 10Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO AND SPEAKERS

Realtek ALC3234 High Definition Audio Codec (2 channel)	Integrated on system board
Internal Chassis Speaker	Standard
Dell AC511 USB SoundBar	Optional
Dell AE515 Pro USB SoundBar	Optional
Dell AX210 USB Stereo Speakers	Optional

KEYBOARD AND MOUSE

Dell Premier Wireless Keyboard and Mouse - KM717	Optional
Dell Wireless Keyboard and Mouse - KM636	Optional
Dell KB813 Smartcard Keyboard	Optional
Dell KB216 Wired Multimedia Keyboard Black	Optional
Dell Optical Wired Mouse - MS116	Optional
Dell Laser Scroll USB 6-Buttons Silver and Black Mouse	Optional

SECURITY

Trusted Platform Module (TPM) 1.2[1] and TPM 2.0 Note: All systems are field upgradable to TPM 2.0 (with firmware & BIOS updates plus Windows 10 Installation	Integrated on system board TPM 2.0 is 100% on Windows 10 systems We enable TPM 1.2 with Windows 7, RHEL, Ubuntu & Neo-Kylin
Chassis Intrusion Switch with AC power interlock Note: System powers down when right side cover is opened	Standard
Dell Smartcard Keyboard	Optional
Chassis Kensington® lock slot, Padlock loop	Standard
Externally removable Power Supply—lockable with interior screw	Standard
Front and rear FlexBay bezels are lockable	Standard
Hard drive/SSD FlexBay sleds with key lock - set of 4 with 2 keys	Optional—Factory installed or Customer kit

[1]TPM is not available in all countries. Depending on your country regulations, no-TPM system boards may be available.

SECURITY SOFTWARE

Dell Data Guardian,	Optional
Dell Encryption Personal or Enterprise License, ProSupport for Software	Optional
Dell Endpoint Security Suite Enterprise + Dell Data Guardian	Optional
Dell Threat Defense	Optional

MISC. SOFTWARE

Dell Precision Optimizer	Included at no charge
Dell Precision Optimizer Premium Perpetual (AI based)	Optional

SERVICE AND SUPPORT

3 Year Warranty[1] Next Business Day On-site[2] (3-3-3)	Standard
ProSupport	Optional

[1] For a copy of our guarantees or limited warranties, please write Dell USA L.P., Attn: Warranties, One Dell Way, Round Rock, TX 78682. For more information, visit www.dell.com/warranty.

[2] Service may be provided by third-party. Technician will be dispatched if necessary following phone-based troubleshooting. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. U.S. only.

DETAILED ENGINEERING SPECIFICATIONS

SYSTEM DIMENSIONS (PHYSICAL)

NOTE: System Weight and Shipping Weight is based on a typical configuration and may vary based on actual configuration. A typical configuration includes: one graphics card one hard drive, one optical drive.

Chassis Volume (liters)	50.1
Typical Chassis Weight (pounds/kilograms)	53.6 lbs/ 24.3 kg
Chassis Dimensions: (HxWxD)	
Height (inches/millimeters)	17.05 in / 433 mm
Width (inches/millimeters)	8.58 in / 218 mm
Depth (inches/millimeters)	22.29 in / 566 mm
Shipping Weight (pounds/kilograms - includes packaging materials)	65.00 lb. / 29.48 kg
Packaging Parameters (HxWxD)	
Height (inches/millimeters)	24.25 in/ 616 mm
Width (inches/millimeters)	14.25 in / 362 mm
Depth (inches/millimeters)	29.25 in / 743 mm

SYSTEM EXPANSION SLOTS

Slot	Type	Voltage supported	Max Height (in,cm)	Max Length (in, cm)	Max Wattage	Cards Supported
1	PCIe x8 Gen 3 open ended slot	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	25	Storage, UltraSpeed Duo, Tera2 Host Card
2	PCIe x16 Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	300*	Graphics
3	PCIe x16 (x1) Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	25	Tera2 Host Card, 1GbE NIC, 2.5/5GbE NIC, Serial Port
4	PCIe x 16 Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	300*	Graphics, UltraSpeed Quad, Tera2 Host Card, 10G NIC, Serial, Thunderbolt
5	PCIe x16 (x4) Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	25	Tera2 Host Card, 1GbE NIC, Serial Port, 2.5/5GbE NIC, Thunderbolt
	Mechanical Slot	n/a				
6	PCIe x16 Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	300*	Requires optional 2nd CPU Graphics, UltraSpeed Duo, UltraSpeed Quad, or Tera2
7	PCIe x16 Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	75	Requires optional 2nd CPU Graphics, UltraSpeed Duo, UltraSpeed Quad, or Tera2

*Total allowed graphics power is up to 900W - via 3x x16 slots @ up to 300W each—with upgraded chassis (CL) that have 8A aux power cabling and connectors . (Requires 2nd CPU to be installed).
1. **220V input/line cord with the 1400Watt PSU is required for 750-900W configurations i.e 3X RTX 5000, 6000, 8000** .
   for customers in 100-120V countries (including U.S. Canada, Japan). Please note.
2. 900W configurations have the following restriction: maximum 2x 150 watt processors **or** no LRDIMMs
3. The 7920 Tower system ships with 3x 6+2 pin (8 pin) aux graphics power connectors (dongles). The 3rd 6+2 Pin connector is located at top of the system with the 2x additional PCIe x16 slots which are enabled when a 2nd CPU is installed.
4. Up to 6x 6+2 dongles can be configured out of the factory as required for high end graphics cards.
5. A splitter customer kit (492-BCQP) to convert a standard single 6+2 connector dongle to two 6+2 connector dongles is available. This is only for chassis with upgraded 8A aux power cable/dongle assemblies—look for CL in the Chassis SKU description.
6. A customer kit (470-ADUR) to upgrade older 7920 Tower chassis to 8A aux power cable/dongle assembly is also available.

DETAILED ENGINEERING SPECIFICATIONS

SUPPLEMENTARY (AUX.) POWER CONNECTORS FOR GRAPHICS CARDS

Supplementary power connectors on 5000/7000 Towers/Rack

- Additional supplementary power connectors will be added as necessary in the factory.

Original Tower chassis

Original Tower Aux Power Connectors Ex factory[1]	
Platform	**PCIe Aux Power Connectors**
5820 Tower 950W	2x 6+2 pin
7820 Tower 950W*	1x 6+2 pin and 1x 6 pin
7920 Tower 1400W	3x 6+2 pin
7920 Rack 1100W & 1600W (220V)	3x 6+2 pin and 3x 6 pin (2-3 cards w 2 CPUs)

6 Pin   6+2 Pin (8)

[1]Dual AMD WX9100v2 and SSG configs ship with an additional 6 pin connector on the 7920 Tower

*Dual P4000,P5000,P6000,GV100 configs ship with 2x 6+2 pin connectors on single CPU 7820 Towers

Tower chassis with updated Aux power cabling/dongles

Upgraded Tower* Aux Power Cabling/Connectors Ex factory w RTX 5K-6K cards	
Platform	**PCIe Aux Power Connectors**
5820 Tower 950W	2x 6+2 pin std. up to 4x 6+2 pin (2 cards)
7820 Tower 950W	2x 6+2 pin std. to 4x 6+2 (2 cards w 1 CPU)
7920 Tower 1400W	3x 6+2 std. up to 6x 6+2 pin (3 cards w 2 CPUs)
7920 Rack 1100W & 1600W (220V)	3x 6+2 pin and 3x 6 pin (2-3 cards w 2 CPUs)
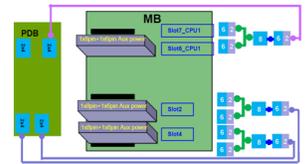
* Tower chassis w upgraded cabling/connectors – e.g. Precision 7820 Tower 950W Chassis CL, Precision 5820 Tower 950W RTX Chassis

Precision 5820 (950W), 7820, 7920 Towers, 7920 Rack

Jan. 2021 High End Graphic Cards Aux Power Requirements & Platform Support

Graphics Card Width	Watts	Aux power dongle(s) required	Platforms supporting Single Cards	Platforms supporting Dual Cards	Platforms supporting Triple cards
Nvidia P4000	<150W SW	1x 6 pin	All	All	4x New 7920 Tower (2CPUs) 7920 Rack (2 CPUs)
Quadro RTX 4000*	160W	1x 8 pin	All	All New 7820 (1 CPU)	4x New 7920 Tower (2CPUs) 3x 7920 Rack (2 CPUs)
Nvidia P5000	<225W	1x 8 pin	All	All 7820 (1 CPU)	7920 Tower/Rack (2 CPUs)
Nvidia P6000	250W	1x 8 pin	All	5820,7820 (1 CPU),7920, 7920 Rack	7920 Tower/Rack (2 CPUs)
Nvidia GV100	250W	1x 8 pin	All	5820,7820 (1 CPU),7920, 7920 Rack (2 CPUs)	7920 Tower/Rack (2 CPUs)
Quadro RTX 5000/6000/8000*	5K 265W 6K,8K 295W	1x 8 pin + 1x 6 pin	5000/7000 Towers/Rack	7920 Tower 7920 Rack (2 CPUs) New 5820/7820 (1	New 7920 Tower (2CPUs) 7920 Rack (2 CPUs)
GeForce RTX 3080/3090	320W	2x 8 pin	5000/7000 Towers	None	None
AMD WX7100/W5500	<150W SW	1x 6 pin	All	5820,7280,7920 Towers 7920 Rack (2 CPUs)	7920 Tower/Rack (2 CPUs)
AMD WX9100v2*	300W	1x 8 pin + 1x 6 pin	5820,7820 7920 Towers/Rack	7920 Tower 7920 Rack (2 CPUs)	N/A
AMD Radeon Pro W5700	205W	1x 8 pin + 1x 6 pin	5820,7820 7920 Towers	5820,7280 (single CPU),7920 Towers 7920 Rack (2 CPUs)	7920 Tower/Rack (2 CPUs)

New designates tower systems with upgraded graphics power cabling with support for additional dongles. No changes to the PSUs

* Denotes single card support on legacy (SkyLake) & **New** (CL/RTX) chassis, dual card support on legacy & **New** 7920 Tower chassis

SYSTEM LEVEL ENVIRONMENTAL AND OPERATING CONDITIONS, PSU

Temperature	
Operating	10° to 35° C (50° to 95° F)
Non-Operating (Storage)	-40° to 65° C (-40° to 149° F)
Relative Humidity	20% to 80% (non-condensing)
Maximum vibration	
Operating	5 to 350 Hz at 0.0002 G²/Hz
Non-Operating	5 to 500 Hz at 0.001 to 0.01 G²/Hz
Maximum Shock	
Operating	40 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 51 cm/sec [20 in/sec])
Non-Operating	105 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 127 cm/sec [50 in/sec])
Maximum Altitude	
Operating	−15.2 to 3048 m (−50 to 10,000 ft)
Non-Operating	−15.2 to 10,668 m (−50 to 35,000 ft)

POWER

NOTE: These form factors utilize a more efficient Active Power Factor Correction (APFC) power supply. Dell recommends only Universal Power Supplies (UPS) based on Sine Wave output for APFC PSUs, not an approximation of a Sine Wave, Square Wave, or quasi-Square Wave.

1. PSUs are single rail (like servers) which means additional power can be delivered on demand to cards/subsystems as needed.

2. A safety interlock will shut down powered system 3 seconds (audible alarm) after side door is opened.

	Specifications
Power Supply Wattage	1400W (for AC input voltages of 181—240 Vac) 1100W (for AC input voltages of 108—180 Vac) 1000W (for AC input voltages of 100—107 Vac)
AC input Voltage Range	100 - 240 Vac
AC input current (low ac range/high AC range)	15.0 A / 8.0 A
AC input Frequency	50 Hz / 60Hz
AC holdup time (80% load)	16 MSEC
Average Efficiency (Energy Star 5.2 Compliant)	87 – 90 – 87% @ 20 – 50 – 100% load
DC parameters	
+12.0v output	12V; 91.6A	116.7A
+12.0v auxiliary output	8.0A
-12.0v output	0.5A
Max total power	1400W
BTUs/h (based on PSU max wattage)	4777 BTU
Power Supply Fan	60*25mm (x2)
Compliance:	
0.5 watt requirement	Yes
Climate Savers / 80Plus Compliant	Yes
FEMP (CECP) Standby Power Compliant	Yes

POWER (CONT), HDD CONTROLLERS

3.0V CMOS BATTERY

Brand	Type	Voltage	Composition	Life
MITSUBISHI	CR-2302	3V	Lithium	Continuous Discharge Under 15 kΩ Load to 2.5V End-Voltage: 1000 hours or longer
SHUNWO	CR2302	3V	Lithium	Continuous Discharge Under 15 kΩ Load to 2V End-Voltage: 990 hours or longer
JHT	CR2302	3V	Lithium	Continuous Discharge Under 15 kΩ Load to 2.5V End-Voltage: 1000 hours or longer

BROADCOM MEGARAID PCI-E CONTROLLERS

	MegaRAID(R) 9440-8I	MegaRAID(R) 9460-8I
	Upgrade Option	Upgrade option
RAID Levels	RAID 0, 1, 5, 10	RAID 0, 1, 5, 10
HDD I/F	SATA + SAS, NVMe	SATA + SAS, NVMe
Data transfer rates	SAS—Up to 12 Gb/s per port SATA—Up to 6Gb/s per port NVMe – PCIe Gen3 from MR7.4 (not offered out of the factory with NVMe)	SAS—Up to 12 Gb/s per port SATA—Up to 6Gb/s per port NVMe – PCIe Gen3 from MR7.4
SAS controller	SAS3408	SAS3516
Cache size	None	4 GB 2133MHz DDR4 SDRAM
Battery/Cache Protection	N/A	SuperCAP (CacheVault Flash backup)
PCI card type	3.3V PCI-e 3.0 x8	3.3V PCI-e 3.0 x8
Dimensions	6.127" x 2.712" (155.65 mm x 68.90 mm)	6.127" x 2.712" (155.65 mm x 68.90 mm)

AUDIO—INTEGRATED

REALTEK ALC3234 HIGH DEFINITION AUDIO	
High Definition Stereo support	X
Number of channels	2
Number of Bits / Audio resolution	16, 20, and 24-bit resolution
Sampling rate (recording/playback)	Support 44.1K/48K/96K/192 kHz sample rates
Signal to Noise Ratio	95 dB DAC outputs, 90 dB for ADC inputs
Analog Audio	X
Dolby Digital	
THX	
Digital out (S/PDIF)	
Audio Jack Impedance	
Microphone	32K ohms
Line-In	32K ohms
Line-Out	200 ohms
Headphone	1 ohm
Internal Speaker Power Rating	2.3 Watts (max) / 2.0 Watts (typ)

COMMUNICATIONS—INTEGRATED LAN

INTEL® I219 GIGABIT1 ETHERNET LAN 10/100/1000	
External Connector Type	RJ45
Data Rates supported	10/100/1000 Mbps
Controller Details	
Controller bus architecture	Intel direct-connect
Integrated memory	N/A
Data transfer mode (example Bus-Master DMA)	N/A
Power consumption (full operation per data rate connection speed)	690mW (Max.)
Power consumption (standby operation)	107mW (Max.)
IEEE standards compliance (example 802.1P)	802.3
Hardware Certifications (example FCC, B, GS mark…)	N/A
Boot ROM Support	EEPROM (located in SPI)
Network Transfer Mode (example Full Duplex, Half Duplex)	
Network Transfer Rate (example 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps	10 Mb (full/half-duplex) 100 Mb (full/half-duplex) 1000 Mb (full-duplex)

COMMUNICATIONS—INTEGRATED LAN (CONT.)

INTEL® I217-LM GIGABIT1 ETHERNET LAN 10/100/1000 (CONT.)	
Environmental	
Operating System Driver Support	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04
Manageability (examples WOL, PXE)	WOL, PXE 2.1
Management Capabilities Alerting	Intel® Standard Manageability, Intel Xeon Processor with vPro Technology

[1] This term does not connote an actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

COMMUNICATIONS—INTEGRATED LAN CONT'D

Intel® I210 1Gb Ethernet Adapter	
Connector Type	RJ45
Data Rates supported	10/100/1000 Mbps copper
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCI Express* Gen 2.1 x1
Integrated memory	Dual 48K configurable TX/RX FIFO Buffers
Data transfer mode (example Bus-Master DMA)	Bus-Master DMA
Power consumption (full operation per data rate connection speed)	810mW
Power consumption (standby operation)	Less than 300mW
IEEE standards compliance (example 802.1P)	802.1p, 802,1q, 802.2, 802.3, 802.3ab
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	Disabled
Network Transfer Mode (example Full Duplex, Half Duplex)	
Network Transfer Rate (example 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps	10BASE-T (half-duplex) 10 Mbps* 10BASE-T (full-duplex) 20 Mbps* 100BASE-TX (half-duplex) 100 Mbps* 100BASE-TX (full-duplex) 200 Mbps* 1000BASE-T (full-duplex) 2000 Mbps* * Depends on the system environment.

Environmental	
Operating System Driver Support	Same as System
Manageability (examples WOL, PXE)	WOL, PXE2.1, ACPI v1.1
Management Capabilities Alerting (example ASF 2.0)	None

COMMUNICATIONS—INTEL 10GBE AND AQUANTIA 5GBE NICS

Intel® 1OGbE PCIe Ethernet Server Adapter X550-T2	
Connector Type	2X RJ45
Data Rates supported	100Mb/1GbE/2.5GbE/5GbE/10GbE
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCI Express* Gen 3 x4
Data transfer mode (example Bus-Master DMA)	Bus-Master DMA
Power consumption (full operation per data rate connection speed)	13W
Power consumption (standby operation)	Less than 300mW
IEEE standards compliance (example 802.1P)	802.3an, 802.3, P802.3bz, 1149.6, 802.3ap, 1149.1, 802.1Q, 1588, P802.1AE, 802.3az, 802.1BR, 802.Qbg, 802.1Qaz, 802.1Qbb, 802.1BR, 802.1p, 802.1AS
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	Disabled
Network Transfer Mode (example Full Duplex, Half Duplex)	
Network Transfer Rate (example 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps	1000BASE-T (full-duplex) 2000 Mbps Max* 2.5G NBASE-T (full-duplex) 5000 Mbps Max* 5G NBASE-T (full-duplex) 10000 Mbps Max* 10GBASE-T (full-duplex) 20000 Mbps Max* * Depends on the system environment.
Environmental	
Operating System Driver Support	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04
Manageability (examples WOL, PXE)	WfM, DMI 2.0, WMI, SNMP, RIS, PXE 2.0
Management Capabilities Alerting (example ASF 2.0)	None

Aquantia	
Connector Type	1X RJ45
Data Rates supported	100Mb/1GbE/2.5GbE/5GbE
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCI Express* Gen 3 x1
Data transfer mode (example Bus-Master DMA)	Bus-Master DMA
Power consumption (full operation per data rate connection speed)	3.5W
Power consumption (standby operation)	Less than 300mW
IEEE standards compliance (example 802.1P)	802.3bs, 802.3, 802.1P, 802.1AE, 802.1QAV
Hardware Certifications (example FCC, B, GS mark…)	UL, CSA, LVD/CE, FCC, ICES, ACA, BSMI, RRL, VCCI
Boot ROM Support	Disabled

COMMUNICATIONS—5G NIC, USB 3.1 GEN 2 TYPE C PCIE CARD

Aquantia Continued	
Network Transfer Mode (example Full Duplex, Half Duplex)	
Network Transfer Rate (example 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps	1000BASE-T (full-duplex) 2000 Mbps Max* 2.5G NBASE-T (full-duplex) 5000 Mbps Max* 5G NBASE-T (full-duplex) 10000 Mbps Max* * Depends on the system environment.

Environmental	
Operating System Driver Support	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04
Manageability (examples WOL, PXE)	WOL, ACPI, UEFI 2.3/2.5 and PXE 2.1
Management Capabilities Alerting (example ASF 2.0)	None

SUNIX USB 3.2 GEN 2 TYPE-C 10G & DISPLAYPORT ALT-MODE PCI EXPRESS HOST CARD	
External Connector Type	2 x USB 3.2 Gen Type-C, 1 x DP (input)
Port feature	1 Data only USB-C, 1 Full Feature USB-C, 1 DP in
Controller Details	
Data Transfer Rate	Super Speed+ (10Gbps), Super Speed (5Gbps), High Speed (480Mbps), Full Speed (12Mbps), Low Speed (1.5Mbps)
Controller type	Asmedia ASM1142
Data transfer mode (example Bus-Master DMA)	N/A
PCIe bus connector	PCIe Gen3 x1
Power from USB-3.2 Gen 2 Type C (DP/PowerDelivery)	5V/1.5A each
Card Power consumption max	18.3W

COMMUNICATIONS—ADD IN SERIAL PORT AND THUNDERBOLT 3.0 CARDS

Dell PCIe Serial FH/LP Card (DPWC100)	
Connector Type	RS-232
Data Rates supported	250Kbps
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCIe Gen 1.1 X1
Data transfer mode (example Bus-Master DMA)	Serial Bus
Power consumption (full operation per data rate connection speed)	1.05W + 12W (1A Configurable at 5V or 12V)
Power consumption (standby operation)	Less than 1.05W
Standards compliance (example 802.1P)	RS-232, Power COM port(5V/12V)
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	No
Operating System Driver Support	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04

Thunderbolt 3 PCIe Card	
Connector Type	Thunderbolt 3, DisplayPort
Data Rates supported	40Gb/s
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCIe Gen 3 X4
Data transfer mode (example Bus-Master DMA)	4× PCI Express 3.0, DisplayPort 1.2
Power consumption (full operation per data rate connection speed)	2.5W + 30W Device
Power consumption (standby operation)	300mW
Standard compliance (example 802.1P)	Thunderbolt 3, DP 1.2, USB 3.1 Gen2
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	No

Environmental	
Operating System Driver Support	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04
Manageability (examples WOL, PXE)	None
Management Capabilities Alerting (example ASF 2.0)	None

COMMUNICATIONS—PCOIP REMOTE ACCESS HOST SOLUTIONS

Dell PCIe Quad Display PCoIP Remote Access Host Card (Full height)	
Connector Type	RJ45 x 1, mDP x 4
Displays supported	2 @ 2560 x 1600 or 4 @ 1920 x 1200
Imaging Performance	130 Mpps 60fps
Dongles supplied	mDP to DP x 4
Optional dongle for DMS59 to DVI graphics cards	DVI **to** mDP
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCIe Gen 1.1 X1
Data transfer mode (example Bus-Master DMA)	N/A
Integrated memory	Flash Memory:256 Mbit (parallel fastboot flash) System RAM:512MB DDR3 ECC
Power consumption (full operation per data rate connection speed)	13.15 W
Power consumption (standby operation)	N/A
Standards compliance (example 802.1P)	802.1x, DisplayPort
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	No
Operating System Driver Support (Web down load—not factory installed)	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04

Dell PCIe Dual display PCoIP Remote Access Host Card, (half height/full height bracket)	
Connector Type	RJ45 x 1, mDP x 2
Displays supported	1 @ 2560 x 1600 or 2 @ 1920 x 1200
Imaging Performance	130 Mpps 60fps
Dongles supplied	mDP to DP x 2
Optional dongle for DMS59 to DVI graphics cards	DVI **to** mDP
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	PCIe Gen 1.1 X1
Data transfer mode (example Bus-Master DMA)	N/A
Integrated memory	Flash Memory:256 Mbit (parallel fastboot flash) System RAM:512MB DDR3 ECC
Power consumption (full operation per data rate connection speed)	13.15 W
Power consumption (standby operation)	N/A
Standards compliance (example 802.1P)	802.1x, DisplayPort
Hardware Certifications (example FCC, B, GS mark…)	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Boot ROM Support	No
Operating System Driver Support (Web down load—not factory installed)	Windows 7 Pro 64, Windows 10 for workstations, Red Hat Linux 7.0, 8.0, Ubuntu 18.04

GRAPHICS

NVIDIA NVS 315	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory	1 GB DDR3
Open GL	4.1
Open CL	Not supported
DirectX	11.0
Vulcan	Not supported
PCIe support	x16 Gen2
Max Resolution (# of DisplayPorts used)	2560x1600 (using DMS59 to DisplayPort adapter) 1920x1200 (using DMS50 to DVI-I adapter)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	2
Maximum monitors (direct connection)	2
Max # of 4Kx2K displays @ 60hz	0
Max # of 5120x2880 pixel displays @ 60hz	0
Video connectors	1 DMS-59
Included video adapters (with systems or customer kits)	1 DMS-59 to dual SL-DVI-I
Aux power connectors needed	None
Maximum power	19.5 W

GRAPHICS

NVIDIA QUADRO P400	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory (GDDR5)	2 GB
Open GL	4.5
Open CL	yes
DirectX	11.2
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120x2880 24bpp @ 60hz
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	3
Maximum monitors (direct connection)	3
Max # of 4Kx2K displays @ 60hz	3
Max # of 5120x2880 pixel displays @ 60hz	1
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	three mini-DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	30 W

GRAPHICS

NVIDIA QUADRO P620	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory (GDDR5)	2 GB
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680 x 4320 x 24 bpp @ 30 Hz per DP port
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4
Max # of 5120x2880 pixel displays @ 60hz	4
Max # of 7280x4320 pixel displays @ 60hz	2 (8K usage not recommended)
Video connectors	four mini-DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	40 W

GRAPHICS

NVIDIA QUADRO P1000	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory (GDDR5)	4 GB
Open GL	4.5
Open CL	yes
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120x2880 24bpp @60hz (one DisplayPort)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4
Max # of 5120x2880 pixel displays @ 60hz	4
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	four mini-DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	47 W

GRAPHICS

RADEON PRO WX 2100	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory (GDDR5)	2 GB
Open GL	4.5
Open CL	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120x3200, 24bpp, 60Hz 3840x4320, 24bpp, 60Hz (half 8K)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	5
Maximum monitors (direct connection)	3
Max # of 4Kx2K displays @ 60hz	3 (1 display @120Hz)
Max # of 5120x2880 pixel displays @ 60hz	1
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	2 miniDP 1.4 + one DisplayPort 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	50 W

GRAPHICS

RADEON PRO WX 3200	
PCIe slot width	1 slot full height and available in half height for SFF chassis
Memory (GDDR5)	4 GB
Open GL	4.6
Open CL	2.0
DirectX	12.0
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	1x 7680x4320, 69Hz 2x 5120x3200, 60Hz 4x 3840x2160, 60Hz 4x 1920x1080, 60Hz
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	3
Max # of 4Kx2K displays @ 60hz	3 (1 display @120Hz)
Max # of 5120x2880 pixel displays @ 60hz	1 (dual DP cables)
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	2 miniDP 1.4 + one DisplayPort 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	50 W

GRAPHICS

NVIDIA QUADRO P2200	
PCIe slot width	1
Memory (GDDR5)	5 GB
Open GL	4.6
Open CL	
DirectX	12.0
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120x2880 24bpp @60hz (4 DisplayPort)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (4 @ 120Hz)
Max # of 5120x2880 pixel displays @ 60hz	4
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	four DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	75 W

GRAPHICS

NVIDIA QUADRO RTX 4000	
PCIe slot width	Single
Memory (GDDR6)	8 GB
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
PCIe support	x16 Gen3
VR Ready	Yes
Max Resolution (# of DisplayPorts used)	5120 x 2880 24bpp @60hz (one DisplayPort 1.4);
Max Resolution (# of DisplayPorts used)	7680 × 4320 36bpp @60Hz (two DisplayPorts 1.4 OR one DisplayPort 1.4 if 8K DSC panel)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (4 @ 60Hz)
Max # of 5120x2880 pixel displays @ 60hz	4 (4 @ 60Hz)
Max # of 7280x4320 pixel displays @ 60hz	2 (2 @ 60Hz) OR 4 (4 @ 60Hz if 8K DSC panel)
Video connectors	Three DisplayPorts 1.4
Video connectors	One USB-C (DP1.4 bandwidth)
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	8-pin
Maximum power	160W (with USB-C)

GRAPHICS

RADEON PRO WX 5100	
PCIe slot width	1
Memory (GDDR5)	8 GB
Open GL	4.5
Open CL	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 30bpp @60hz (two DisplayPorts)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (1 display @120hz)
Max # of 5120x2880 pixel displays @ 60hz	2 (dual DP cables)
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	four DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	75 W

GRAPHICS

RADEON PRO W5500	
PCIe slot width	1
Memory (GDDR5)	8 GB GDDR6
Open GL	4.6
Open CL	2.0
DirectX	12.0
Vulcan	1.1
PCIe support	x16 Gen4
Max Resolution (# of DisplayPorts used)	7680x4320 @ 60Hz (two DisplayPorts)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4
Max # of 5120x2880 pixel displays @ 60hz	2
Max # of 7280x4320 pixel displays @ 60hz	2
Video connectors	4x DisplayPort 1.4
Included video adapters (with systems or customer kits)	None
PCIe Aux power connectors needed	6 pin
Maximum power	125 W

GRAPHICS

RADEON PRO WX 7100	
PCIe slot width	1
Memory (GDDR5)	8 GB
Open GL	4.5
Open CL	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 30bpp @60hz (two DisplayPorts)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (1 display @120hz)
Max # of 5120x2880 pixel displays @ 60hz	2 (dual DP cables)
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	four DisplayPorts 1.4
Included video adapters (with systems or customer kits)	None
PCIe Aux power connectors needed	6-pin
Maximum power	130 W

GRAPHICS

NVIDIA QUADRO RTX 5000	
PCIe slot width	Dual
Memory (GDDR6)	16GB
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
VR Ready	Yes
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120 x 2880 24bpp @60hz (one DisplayPort 1.4);
Max Resolution (# of DisplayPorts used)	7680 × 4320 36bpp @60Hz (two DisplayPorts 1.4 OR
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (4 @ 60Hz)
Max # of 5120x2880 pixel displays @ 60hz	4 (4 @ 60Hz)
Max # of 7280x4320 pixel displays @ 60hz	2 (2 @ 60Hz) OR 4 (4 @ 60Hz if panel is 8K DSC)
Video connectors	Four DisplayPorts 1.4
Video connectors	One USB-C (DP1.4 bandwidth)
Included video adapters (with systems or customer kits)	None
card to card connectors	x8 NVLink
PCIe Aux power connectors needed	8+6-pin
Maximum power	265 W (with USB-C)

GRAPHICS

RADEON PRO W5700	
PCIe slot width	2
Memory (GDDR5)	8 GB GDDR6
Open GL	4.6
Open CL	2.0
DirectX	12.0
Vulcan	1.1
PCIe support	x16 Gen4
Max Resolution (# of DisplayPorts used)	7680x4320 @60hz (two DisplayPorts)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	6
Maximum monitors (direct connection)	6
Max # of 4Kx2K displays @ 60hz	6
Max # of 5120x2880 pixel displays @ 60hz	3
Max # of 7280x4320 pixel displays @ 60hz	3
Video connectors	5x mDP 1.4, 1x USB-C
Included video adapters (with systems or customer kits)	None
PCIe Aux power connectors needed	8-pin + 6-pin
Maximum power	205 W

GRAPHICS

RADEON PRO WX 9100	
PCIe slot width	2
Memory (GDDR5)	16 GB HMB2
Open GL	4.5
Open CL	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 @ 60Hz (two DisplayPorts)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	6
Maximum monitors (direct connection)	6
Max # of 4Kx2K displays @ 60hz	6 (2 displays @120Hz)
Max # of 5120x2880 pixel displays @ 60hz	3 (dual DP cables)
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	6 mini-DisplayPort 1.4
Included video adapters (with systems or customer kits)	None
PCIe Aux power connectors needed	8 pin + 6 pin
Maximum power	250 W

GRAPHICS

NVIDIA GEFORCE RTX 3080	
PCIe slot width	2.5
Memory (GDDR6)	10GB
Open GL	4.6
Open CL	Not Listed; probably 1.2
DirectX	12
Vulcan	1.2
PCIe support	x16 Gen4
Max Resolution	7680 × 4320
Maximum monitors (direct connection)	4
Video connectors	3x DisplayPorts 1.4a
Video connectors	1x HDMI 2.1
Included video adapters (with systems or customer kits)	None
Card to card connectors	None
PCIe Aux power connectors needed	2x 8-pin
Maximum power	320W

GRAPHICS

NVIDIA GEFORCE RTX 3090	
PCIe slot width	2.5
Memory (GDDR6)	24GB
Open GL	4.6
Open CL	Not Listed; probably 1.2
DirectX	12
Vulcan	1.2
PCIe support	x16 Gen4
Max Resolution	7680 × 4320
Maximum monitors (direct connection)	4
Video connectors	3x DisplayPorts 1.4a
Video connectors	1x HDMI 2.1
Included video adapters (with systems or customer kits)	None
Card to card connectors	None
PCIe Aux power connectors needed	2x 8-pin
Maximum power	350W

GRAPHICS

NVIDIA QUADRO RTX 6000	
PCIe slot width	Dual
Memory (GDDR6)	24GB
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120 x 2880 24bpp @60hz (one DisplayPort 1.4);
Max Resolution (# of DisplayPorts used)	7680 × 4320 36bpp @60Hz (two DisplayPorts 1.4 OR one DisplayPort 1.4 if 8K DSC panel)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (4 @ 60Hz)
Max # of 5120x2880 pixel displays @ 60hz	4 (4 @ 60Hz)
Max # of 7280x4320 pixel displays @ 60hz	2 (2 @ 60Hz) OR 4 (4 @ 60Hz if panel is 8K DSC)
Video connectors	Four DisplayPorts 1.4
Video connectors	One USB-C (DP1.4 bandwidth)
Included video adapters (with systems or customer kits)	None
card to card connectors	x16 NVLink
PCIe Aux power connectors needed	8+6-pin
Maximum power	295W (with USB-C)

GRAPHICS

NVIDIA QUADRO RTX 8000	
PCIe slot width	Dual
Memory (GDDR6)	24GB
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120 x 2880 24bpp @60hz (one DisplayPort 1.4);
Max Resolution (# of DisplayPorts used)	7680 × 4320 36bpp @60Hz (two DisplayPorts 1.4 OR one DisplayPort 1.4 if 8K DSC panel)
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4 (4 @ 60Hz)
Max # of 5120x2880 pixel displays @ 60hz	4 (4 @ 60Hz)
Max # of 7280x4320 pixel displays @ 60hz	2 (2 @ 60Hz) OR 4 (4 @ 60Hz if panel is 8K DSC)
Video connectors	Four DisplayPorts 1.4
Video connectors	One USB-C (DP1.4 bandwidth)
Included video adapters (with systems or customer kits)	None
PCIe Aux power connectors needed	8+6-pin
Maximum power	295W (with USB-C)

GRAPHICS

NVIDIA QUADRO GV100	
PCIe slot width	2
Memory (GDDR5)	32 GB HBM2
Open GL	4.6
Open CL	1.2
DirectX	12.1
Vulcan	1.1
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680 x 4320 x 24 bpp @ 30 Hz per DP port
Maximum Monitors using DP Multi-Stream (monitor to monitor connections)	4 (Connecting displays using MST shares link bandwidth and reduces maximum supported resolution for each attached display)
Maximum monitors (direct connection)	4
Max # of 4Kx2K displays @ 60hz	4
Max # of 5120x2880 pixel displays @ 60hz	4
Max # of 7280x4320 pixel displays @ 60hz	2 (dual DP cables per display)
Video connectors	Four DisplayPorts
Video connectors	One Stereo (optional)
Video connectors	SYNC connector
Included video adapters (with systems or customer kits)	None
card to card connectors	1 or 2 NVLink (2 recommended)
PCIe Aux power connectors needed	8-pin (ships with an adapter for 8pin to dual PCIe 6-pin for system power)
Maximum power	250W

HARD DRIVES[1,2]

3.5" 1TB SATA 7200 RPM HDD	
Capacity (bytes)	1TB
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	32 MB NCQ
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 5.0W, Active 10.0W
Spin Up Current (reference only)	5V (1A) ,12V (2A)

3.5" 2TB SATA 7200 RPM HDD	
Capacity (bytes)	2TB
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	32 MB NCQ
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 5.0W, Active 10.0W
Spin Up Current (reference only)	5V (1A) ,12V (2A)

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

2. Specifications can vary between drive suppliers

HARD DRIVES[1,2]

3.5" 4TB SATA 7200 RPM ENTERPRISE HDD	
Capacity (bytes)	4TB
Dimensions inches (W x D x H)	Approximately (5.79 in. x 4.00 in. x 1.00 in.)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	64MB
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 4.0W, Active 5.6W
Spin Up Current (reference only)	12V (2A)

3.5" 8TB SATA 7200 RPM ENTERPRISE HDD	
Capacity (bytes)	8TB
Dimensions inches (W x D x H)	Approximately (5.79 in. x 4.00 in. x 1.00 in.)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	256MB
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 7.2W, Active 9.0W
Spin Up Current (reference only)	12V (2A)

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

[2] Specifications can vary between drive suppliers

HARD DRIVES[1,2]

3.5" 12TB SATA 7200 RPM ENTERPRISE HDD	
Capacity (bytes)	12TB
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	256MB
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 5.0W, Active 7.8.0W
Spin Up Current (reference only)	12V (2A)

3.5" 4TB SAS 7200 RPM nearline HDD	
Capacity (bytes)	4TB
Dimensions inches (W x D x H)	101.85mm x 147mm x 26.1mm
Interface type and Maximum speed	SAS Up to 12Gb/s
Internal buffer size	128MB
Rotational Speed	7,200 RPM
Power Source	
Power Consumption (reference only –typical)	9.5W
Spin Up Current (reference only)	+12V: 1.49 Amp

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

[2.] Specifications can vary between drive suppliers

HARD DRIVES[1,2]

2.5" 500GB SATA 7200 RPM HDD	
Capacity (bytes)	500GB
Dimensions inches (W x D x H)	Approximately (2.75 x 3.94 x 0.374 inches)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
Internal buffer size	16 MB
Rotational Speed	7200 RPM
Power Source	
Power Consumption (reference only)	Idle 0.70W, Active 3.25W
Spin Up Current (reference only)	5V (1000 mA)

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

[2.] Specifications can vary between drive suppliers

HARD DRIVES[1] (CONT.)

2.5" 300GB SAS 15K RPM HDD	
Capacity (bytes)	300GB
Dimensions inches (W x D x H)	Approximately (2.75 x 3.94 x 0.374 inches)
Interface type and Maximum speed	SAS Up to 6Gb/s
Internal buffer size	32MB
Rotational Speed	15,000 RPM
Power Source	
Power Consumption (reference only –typical)	9.0W
Spin Up Current (reference only)	Not Specified

2.5" 600GB SAS 15K RPM HDD	
Capacity (bytes)	600GB
Dimensions inches (W x D x H)	69.85mm x 100.45mm x 15mm
Interface type and Maximum speed	SAS Up to 6Gb/s
Internal buffer size	64MB
Rotational Speed	15,000 RPM
Power Source	
Power Consumption (reference only –typical)	9.0W
Spin Up Current (reference only)	Not Specified

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

[2.] Specifications can vary between drive suppliers

HARD DRIVES[1] (CONT.)

2.5" 900GB SAS 15K RPM HDD	
Capacity (bytes)	900GB
Dimensions inches (W x D x H)	Approximately (2.75 x 3.94 x 0.374 inches)
Interface type and Maximum speed	SAS Up to 6Gb/s
Internal buffer size	16MB Minimum
Rotational Speed	10,000 RPM
Power Source	
Power Consumption (reference only)	Active 9.0W
Spin Up Current (reference only)	Not Specified

[1] For hard drives, GB means 1 billion bytes ; actual capacity varies with preloaded material and operating environment and will be less.

[2.] Specifications can vary between drive suppliers

OPTICAL DRIVES

	8x Slimline DVD-ROM	8x Slimline DVD +/- R/W[1]	16x Half Height DVD +/- R/W[1]
External Dimensions inches/ centimeters (Without Bezel – W x H x D)	128.0 mm (5.04)/ 9.5mm (0.5 in)/ 126.1mm (4.97in)	128.0 mm (5.04)/ 9.5mm (0.5 in)/ 126.1mm (4.97in)	148.2mm(6in)/42mm (2in)/ 171 (max)
Weight (max) pounds/kilograms	140g	140g	700g
Interface type and speed	SATA 1.5Gbit/s	SATA 1.5Gbit/s	SATA 1.5Gbit/s
Disc Capacity	Standard	Standard	Standard
Internal buffer size	supplier dependent	supplier dependent	supplier dependent
Access Times (typical)	supplier dependent	supplier dependent	supplier dependent
Writes	NA	8x DVD/ 24x CD	16x DVD/48x CD
Reads	8x DVD/ 24x CD	8x DVD/ 24x CD	16x DVD/48x CD
Power Source			
DC Power Requirements	5V	5V	12V, 5V
DC Current	1300mA	1300mA	800mA (12V)/ 1100mA (5V)

	8X Half Height BD-RE
External Dimensions (Without Bezel - W x H x D)	148.2mm x 42mm x 171 (6.0x2.0x7.7 inches)
Weight (max) pounds/kilograms	700g
Interface type and speed	SATA 1.5Gbit/s
Disc Capacity	Standard
Internal buffer size	0.5 MB
Access Times (typical)	supplier dependent
Writes	8X BD/16x DVD/48x CD
Reads	8X BD/16x DVD/48x CD

[1] Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R media provides maximum compatibility.

BIOS DEFAULTS– SUBJECT TO CHANGES WITH NEW RELEASES

System Configuration	Integrated NIC:	Enabled
	Integrated NIC2:	Enabled
	Serial Port:	COM1
	SATA Operation:	AHCI
	SAS RAID Controller	Enabled
	Drives	(All enabled by default)
	SMART Reporting:	Disabled
	USB Configuration::	Enable Boot Support/Front USB Ports/ Rear USB Ports/USB3 Ports
	Audio:	Enabled
	Memory Map IO above 4GB	Disabled (Auto)
	Thunderbolt	Disabled
	Miscellaneous Devices	PCI Slot Enabled
	PCI MMIO Space Size	Small
	HDD Fans:	(depends on system configuration)

Video	Primary Video Slot	Auto

Performance	Multiple Core Support:	All (depends on system configuration)
	Intel® SpeedStep™:	Enabled
	C States Control:	Enabled
	Limit CPUID	Enabled
	Intel TurboBoost	Enabled
	Non-Uniform Memory Access:	Enabled
	HyperThread control:	Enabled
	Cache Prefetch:	Enable Hardware Prefetch and Adjacent Cache Line Prefetch
	RMT:	Enabled

Virtualization Support	Virtualization:	Enabled
	VT for Direct I/O:	Enabled
	Trusted Execution	Disabled

Security	Strong Passwrod	Enabled
	Password Configuration	Min=4, Max=32
	Password Bypass	Disabled
	Password Change	Allow Non-Admin Password Changes
	TPM Security	Disabled
	Computrace	Deactivate
	CPU XD Support	Enable CPU XD Support
	OROM Keyboard Access	Enable
	Admin Setup Lockout	Enable

Secure Boot	Secure Boot Enable	Disabled
	Expert Key Management	Disabled

Power Management	AC Recovery:	Power Off
	Auto On Time:	Disabled
	Deep Sleep Control:	Disabled
	Fan Speed Control:	Auto
	USB Wake Support	Disabled
	Block Sleep	Disabled
	Wake on LAN:	Disabled

BIOS DEFAULTS (CONT.)

|		
Maintenance	Service Tag:	Set by the factory
	Asset Tag:	Optional User Entry
	SERR Message:	Enabled
System Logs	System Logs	List
Engineering Configurations	ASPM	Auto
	PCI-e Link Speed	Auto (Gen3)

CHASSIS ENCLOSURE & VENTILATION REQUIREMENTS

ENCLOSURE VENTILATION

If your enclosure has doors, they need to be of a type that allows at least 30% airflow through the enclosure (front and back).

ENCLOSURE MINIMUM CLEARANCE

Leave a 10.2 cm (4 in.) minimum clearance on all vented sides of the computer to permit the airflow required for proper ventilation.
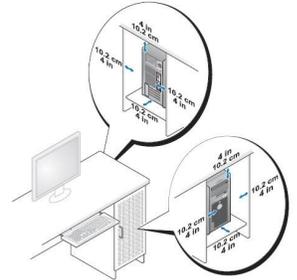
ENCLOSURE DOOR AREA

The intake and exhaust door areas should be, at a minimum, the same size as the system intake and exhaust areas.

RECOMMENDED ENCLOSURE

Do not install your computer in an enclosure that does not allow airflow. This restricts the airflow and impacts your computer's performance, possibly causing it to overheat.

OPEN DESK MINIMUM CLEARANCE

If your computer is installed in a corner, on a desk, or under a desk, leave at least 5.1 cm (2 in.) clearance from the back of the computer to the wall to permit the airflow required for proper ventilation.
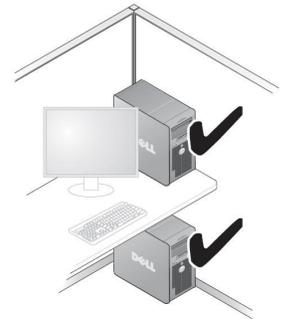
REGULATORY COMPLIANCE AND ENVIRONMENTAL

Product related conformity assessment and regulatory authorizations including Product Safety, Electromagnetic Compatibility (EMC), Ergonomics, and Communication Devices relevant to this product may be viewed at www.dell.com/regulatory_compliance. The Regulatory Datasheet for this product is located at http://www.dell.com/regulatory_compliance.

Details of Dell's environmental stewardship program to conserve product energy consumption, reduce or eliminate materials for disposal, prolong product life span and provide effective and convenient equipment recovery solutions may be viewed at www.dell.com/environment.   Product related conformity assessment, regulatory authorizations, and information encompassing Environmental, Energy Consumption, Noise Emissions, Product Materials Information, Packaging, Batteries, and Recycling relevant to this product may be viewed by clicking the Design for Environment link on the webpage.

Dell Inc.
One Dell Way
Round Rock, Texas 78682
www.dell.com

October 3, 2017

Subject: Statement of Volatility – Dell Precision 5820/7820/7920 Tower

The Dell Precision 5820/7820/7920 Tower contains both volatile and non-volatile (NV) components. Volatile components lose their data immediately upon removal of power from the component. Non-volatile components continue to retain their data even after the power has been removed from the component.

The following memory components are present in the 5820/7820/7920 Tower:

BIOS Configuration
The BIOS information is stored in one flash IC, 32 MByte. This device is identified as SPI_1 on the motherboard. This part contains the boot code and data necessary to take the hardware from a power-off or low-power state to a state where it is ready to | be managed by the operating system. No information pertaining to user applications or data is stored in this device, however, they do store administrator and/or hard drive encryption passwords if those features are enabled by the user.

Embedded Controller
The Embedded Controller contains a 4 Mbit of SPI flash IC and is identified as SPI_2 on the motherboard. The EC contains the software necessary to manage low-level control functions on the motherboard such as thermal control. No information pertaining to user applications or data is stored in the SPI_2 device.

The embedded controller also contains 320 kBytes of volatile memory space and 128 Bytes of RTC backed SRAM. The contents of this memory space are lost when power is removed from the system.

PCH CMOS
The PCH, identified as US1H, contains a 256 Byte battery-backed memory. This memory contains custom configuration data required by the BIOS to boot the system. It does not store passwords or other user level data. The contents of this space are lost, after several minutes, if the coin-cell battery is removed from the motherboard.

TPM (Trusted Platform Module) Security Device
This device (identified as UF1) stores TPM configuration data used by the hardware and the security software offered by Dell. Encrypted user keys generated by the TPM device for use by the security software are stored in this NVM.

CPLD
The CPLD IC is a factory-programmed Logic Device that incorporates various low-level hardware logic functions into a single device. It is in location UO1A on the 7920 Tower, and CLPD0 on the 7820 and 5820 Tower motherboard. No information pertaining to user applications or data is stored on the CPLD. The CPLD contains 90 kBytes of flash memory; however, this memory is left blank initially and is only used for debug information. The CPLD can be reprogrammed during BIOS flash update. The BIOS flash update is not capable of writing to this location.

The following memory components are present in the 7920 Tower only:

Ethernet Controller EEPROM
The Ethernet Controller EEPROM is identified as UL3 on the motherboard. It is a 32 Mbit device. The Ethernet Controller EEPROM stores driver information and the system MAC addresses. It does not store password, IP address, domain name, system ID, or similar information.

All other components on the motherboard will lose data once power is removed from the system. Primary power loss (unplug the power cord) will destroy all user data in the main system memory (DDR4 DIMMs) and the on-board graphics and storage interface devices. **However**, the user should note that under some circumstances (for example, cold temperatures) the DDR4 DIMMs may retain their data for a significant amount of time – up to several minutes. That may potentially allow the DIMMs to be removed from one system and installed in another without loss of the data contained in them.

Secondary power loss (removing the on board coin-cell battery) will destroy system data in the PCH (platform controller hub), including time-of-day information.

There are other volatile and non-volatile components on the devices or peripherals attached to the motherboard:

The Video Card contains volatile and non-volatile memory components. The volatile frame buffer memory will lose data once power is removed. The non-volatile memory (Video BIOS) stores only video card setup information. The video BIOS is not accessible by the user.

The CD-RW/Diskette Drives/DVD-R/W/Blu Ray DVD-R/W are input/output devices, whereas the DVD-ROM is an input device only. All data is processed through cache (volatile) memory. Any associated internal NVRAM is factory programmed, does not contain any user data, and is not accessible by the user.

The SAS and/or SATA Hard Drives and optional storage controller cards store non-volatile data. All data is processed through cache (volatile) memory. Any associated internal NVRAM is factory programmed, does not contain any user data, and is not accessible by the user. These devices may be removed.

The Monitor may retain "Burn-In" images after long periods of displaying static data. If any burn-in images exist, they can readily be seen using simple procedures. NV memory components are used for storing monitor calibration/configuration data & are not accessible by the user.

The DIMMs in the system do contain a small EEPROM that is used for memory identification purposes and for error logging. It does not contain any user data and is not accessible by the customer.

The Voltage Regulators in the system contain a small FW space for power up parameters. It does not contain any user data and is not accessible by the customer.

The CPU Riser for the 7820 Tower and the High Speed Backplanes do contain a small CPLD for power up and device management. They do not contain any user data and are not accessible by the customer.

To help clarify memory volatility and data retention in situations where the system is put in different ACPI power states, the following information is provided regarding ACPI power states S0, S1, S3, S4 and S5:

- S0 state is the working state where the dynamic RAM is maintained and is read/write by the processor.
- S1 state is a low wake-up latency sleeping state. In this state, no system context is lost (CPU or chip set) and hardware maintains all system contexts.
- S3 is called "suspend to RAM" state or stand-by mode. In this state the dynamic RAM is maintained. Dell systems will be able to go to S3 if the OS and the peripherals used in the system supports S3 state. Windows XP, Windows Vista and Windows 7 all support S3 state.
- S4 is called "suspend to disk" state or "hibernate" mode. There is no power. In this state, the dynamic RAM is not maintained. If the system has been commanded to enter S4, the OS will write the system context to a non-volatile storage file and leave appropriate context markers. When the system is coming back to the working state, a restore file from the non-volatile storage can occur. The restore file has to be valid. Dell systems will be able to go to S4 if the OS and the peripherals support S4 state. Windows 7 and Windows 8.1 support S4 state.
- S5 is the "soft" off state. There is no power. The OS does not save any context to wake up the system. No data will remain in any component on the system board, i.e. cache or memory. The system will require a complete boot when awakened. Since S5 is the shut off state, coming out of S5 requires power on which clears all registers.

The Dell Precision 5820/7820/7920 Tower supports all of the above states, except S1.

Please direct any questions to the undersigned

Very truly yours;

Dell Marketing L.P.