PRECISION™ 5820/7820 TOWERS

Technical Guidebook

Dell Precision 5820/7820 Tower

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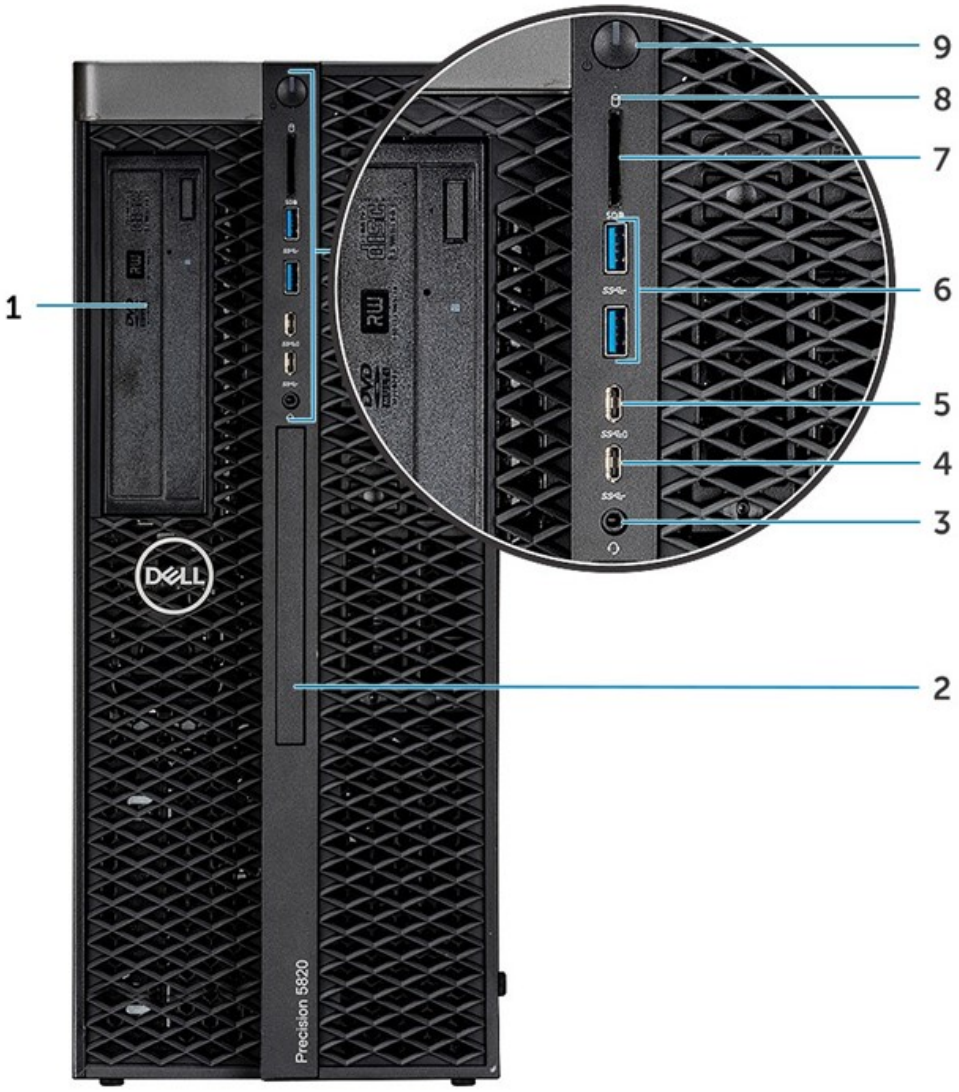
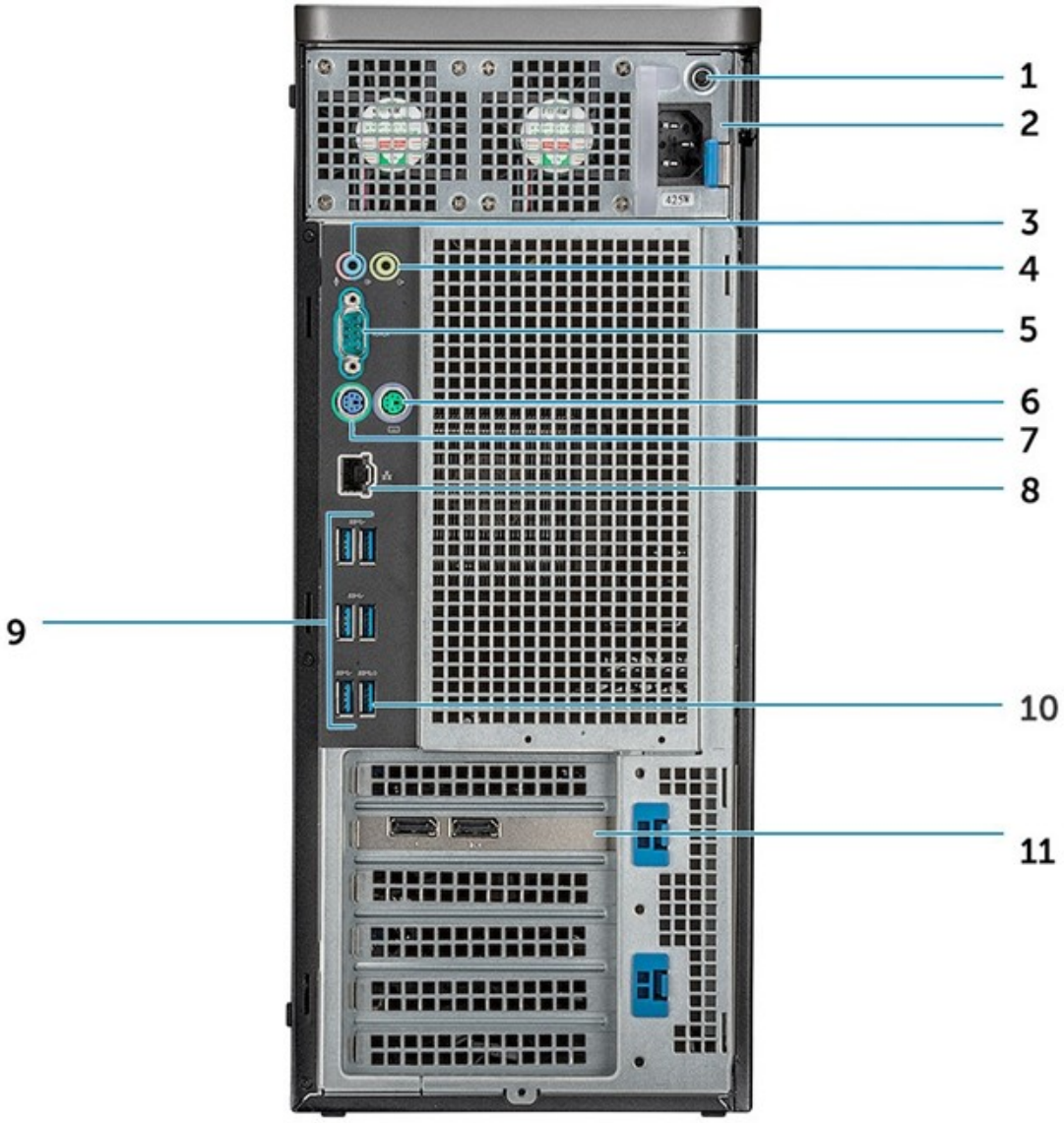


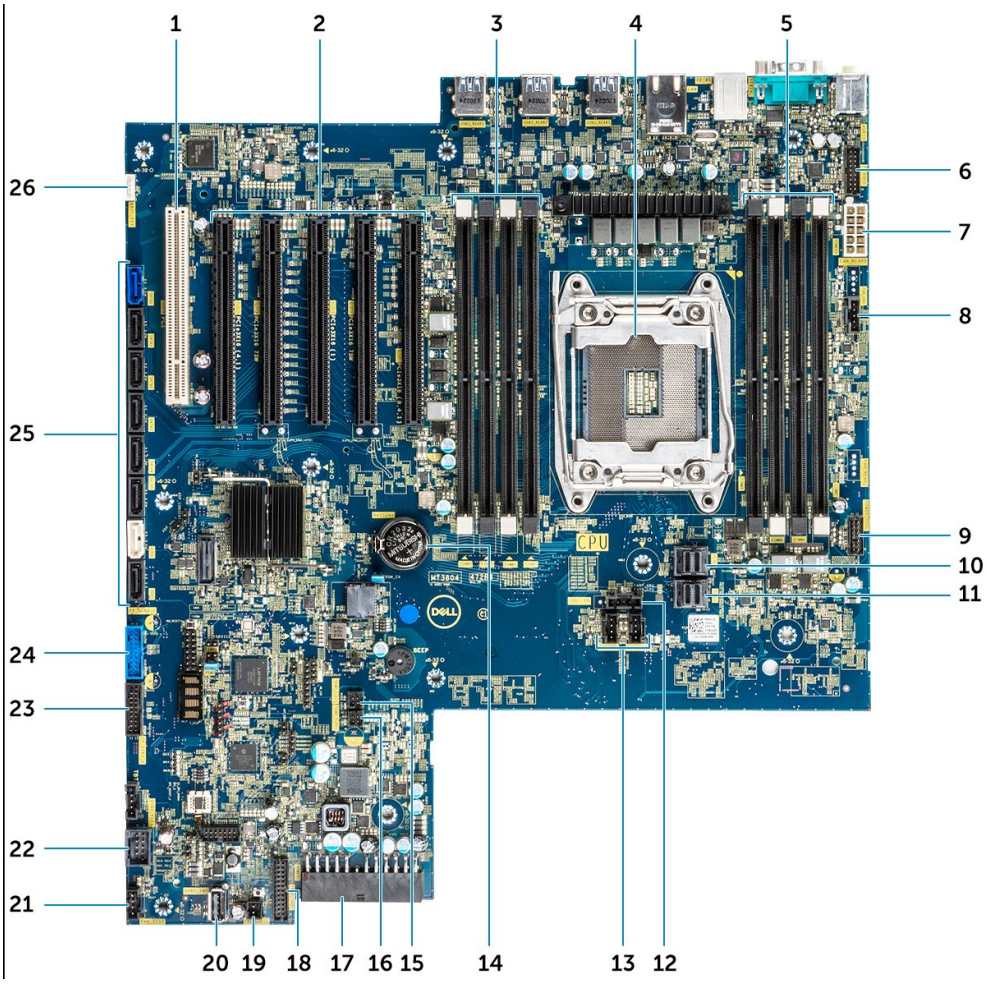
Front View			
1	5.25 inch FlexBay	6	USB 3.1 Gen 1 Type C
2	Slimline optical disk drive	7	SD card slot
3	Universal Headphone Jack	8	HDD activity LED
4	USB 3.1 Gen 1 ports	9	Power button
5	USB 3.1 Gen 1 Type C port with PowerShare		

5820,7820 TOWERS EXTERNAL CHASSIS VIEWS



Rear View			
1	PSU BIST LED	7	PS/2 Keyboard port
2	Power cable connector	8	Network port
3	Microphone /Line-in port	9	USB 3.1 Gen1 ports
4	Line-out port	10	USB 3.1 Gen1 port (supports smart Power -On)
5	Serial port	11	PCIe expansion slot
6	PS/2 Mouse port		

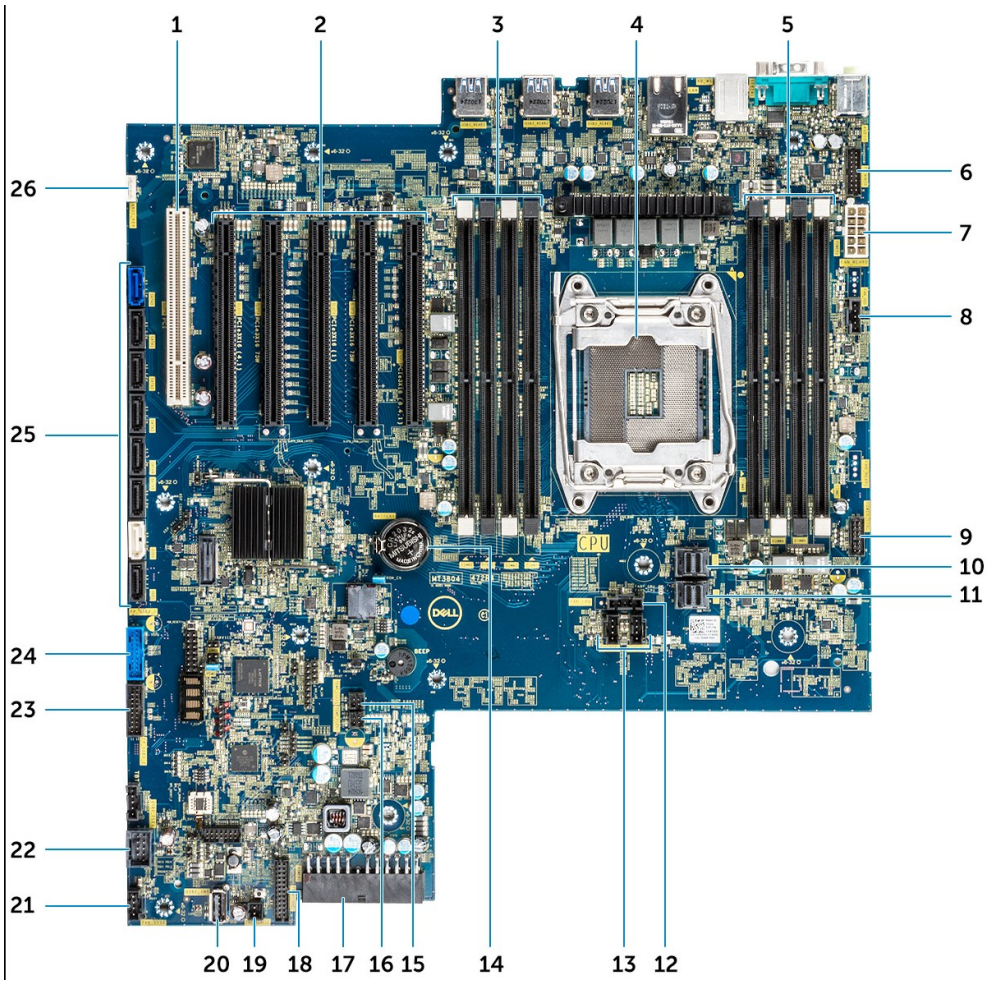
5820 TOWER MOTHERBOARD LAYOUT



System Board Components

Number	Name	Number	Name
1	PCI 32/33 slot (slot6)- 32bit mechanically only	8	HDD Fan Connector
2	PCIe x16 Expansion Slots (Right to Left below)	9	Power Control Connector
	PCIe x16 Gen 3 (wired as x8)—Slot 1	10	PCIe x4 Gen 3—PCIE0
	PCIe x16 Gen 3—Slot 2	11	PCIe x4 Gen 3—PCIE1
	PCIe x16 Gen 3 (wired as x1)—Slot 3	12	CPU Fan Connector
	PCIe x16 Gen 3—Slot 4	13	Front System Fan 1 and 2
	PCIe x16 Gen 3 (wired as x4)—Slot 5	15/16	HDD Thermal Sensor
3	DIMM Slots	17	Power 1 Connector
4	CPU Socket	18	N/A
5	DIMM Slots	19	Remote Power
6	Front Panel Audio connector	20	Internal USB Type A
7	Power 2 Connector	21	Front System Fan 0

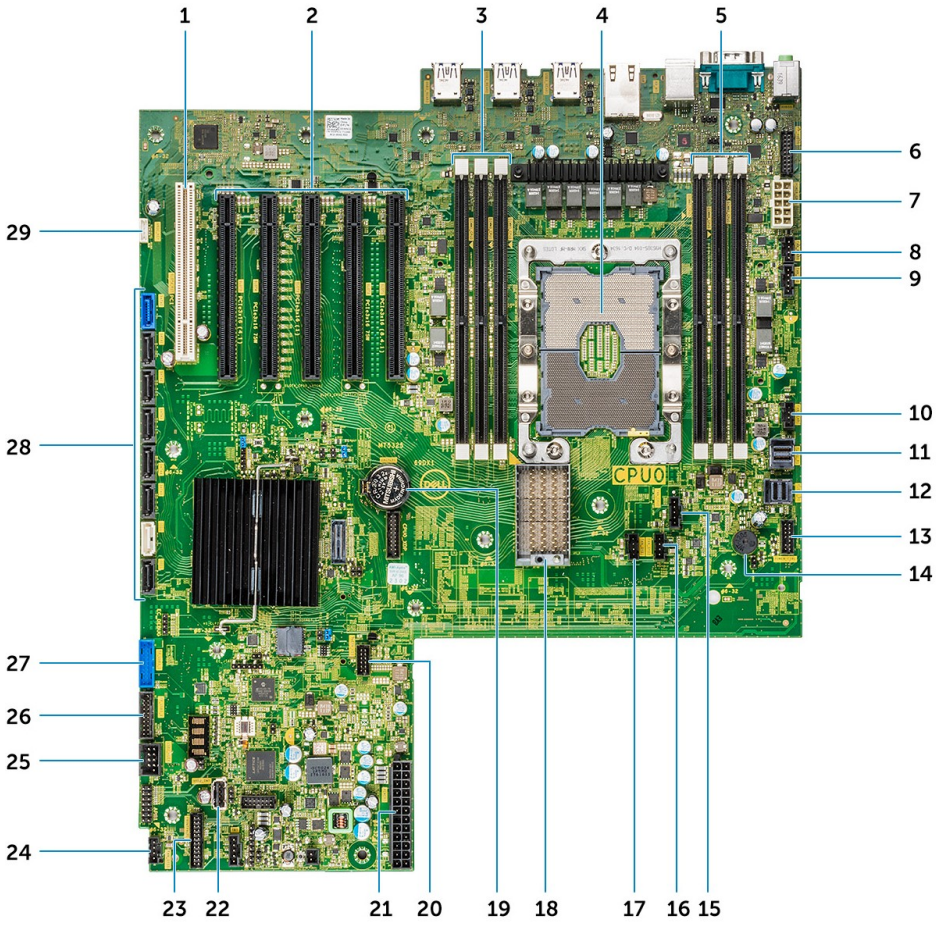
5820 TOWER MOTHERBOARD LAYOUT



System Board Components

Number	Name
22	2x5 USB 2.0 header for flex bay. (Requires optional splitter cable to support 2 x USB 2.0 Type A ports)
23	Front USB Connector
24	Front USB Connector
25	SATA 0/1/2/3/4/5 and ODD 0/1 Connectors
26	VROC Key

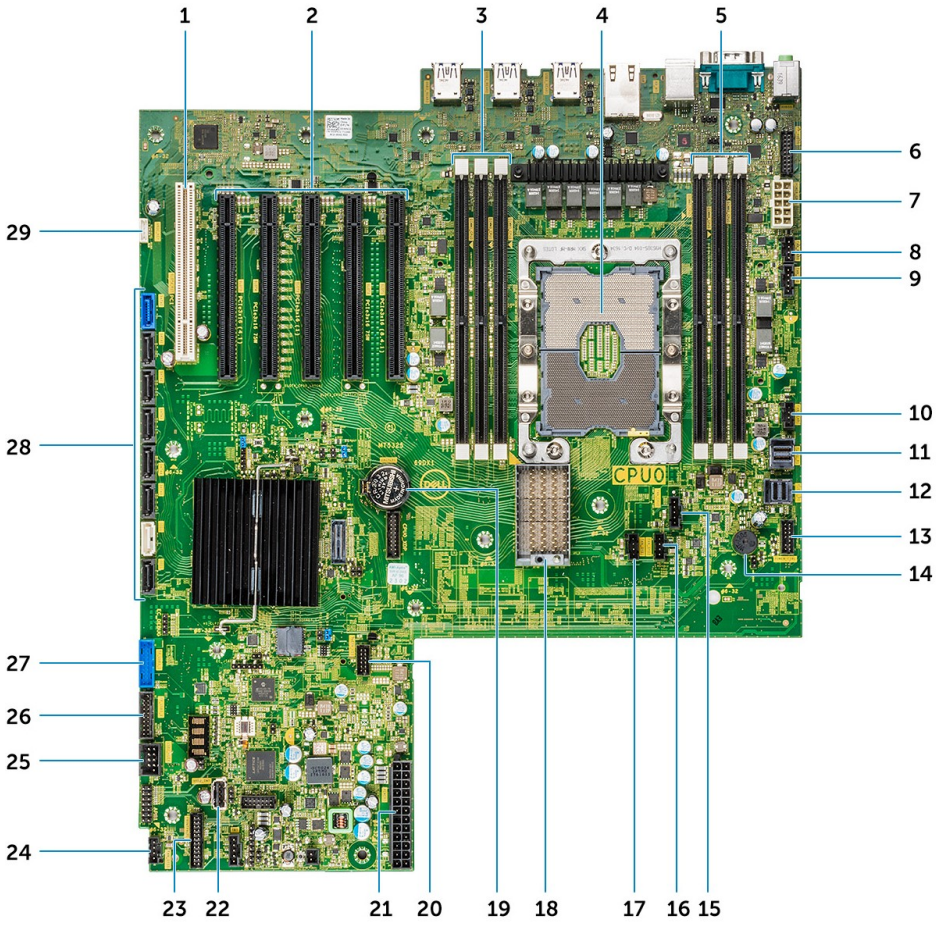
7820 TOWER MOTHERBOARD LAYOUT



System Board Components

Number	Name	Number	Name
1	PCI 32/33 slot (slot6)- 32bit mechanically only	8	Rear Fan 0
2	PCIe x16 Expansion Slots (Right to Left below)	9	Rear Fan 1
	PCIe x16 Gen 3 (wired as x8)—Slot 1	10	HDD Fan Connector
	PCIe x16 Gen 3—Slot 2	11	PCIe x4 Gen 3—PCIE0
	PCIe x16 Gen 3 (wired as x1)—Slot 3	12	PCIe x4 Gen 3—PCIE1
	PCIe x16 Gen 3—Slot 4	13	Power Control Connector
	PCIe x16 Gen 3 (wired as x4)—Slot 5	15	CPU Fan Connector
3	DIMM Slots	16/17	Front System Fan 1 and 2
4	CPU Socket	18	CPU1 Riser Connector
5	DIMM Slots	19	Coin Cell
6	Front Panel Audio connector	20	HDD Thermal Sensor
7	Power 2 Connector	21	Power 1 Connector

7820 TOWER MOTHERBOARD LAYOUT



System Board Components

Number	Name	Number	Name
22	Internal USB Type A	26	Front USB Connector
23	N/A	27	Front USB Connector
24	Front System Fan 0	28	SATA 0/1/2/3/4/5 and ODD 0/1 Ports
25	2x5 USB 2.0 header for flex bay. (Requires optional splitter cable to support 2 x USB 2.0 Type A ports)	29	VROC Key Location

SYSTEM CONFIGURATION OPTIONS

NOTE: Offerings may vary by country. .

OPERATING SYSTEMS

Microsoft® Windows 7® operating system	Factory Installed Microsoft® Windows 7® Professional (64 bit), This is a Windows 10 Pro for Workstations license downgrade option to Windows 7 Pro - while offered by Microsoft
Microsoft® Windows 10® operating system	Factory Installed Microsoft® Windows® 10 Pro for Workstations (64 bit) WHQL Logo achieved with RS2
Red Hat® Enterprise Linux®	Factory installed RHEL workstation 7.3
Ubuntu 16.04 SP1	Factory Installed—limited options supported Ubuntu 16.04 compatible—limited options supported
NeoKylin	Factory Installed in China —limited options supported
Microsoft® Windows XP Professional	Not qualified, no Dell Technical support, no drivers provided

CHIPSET

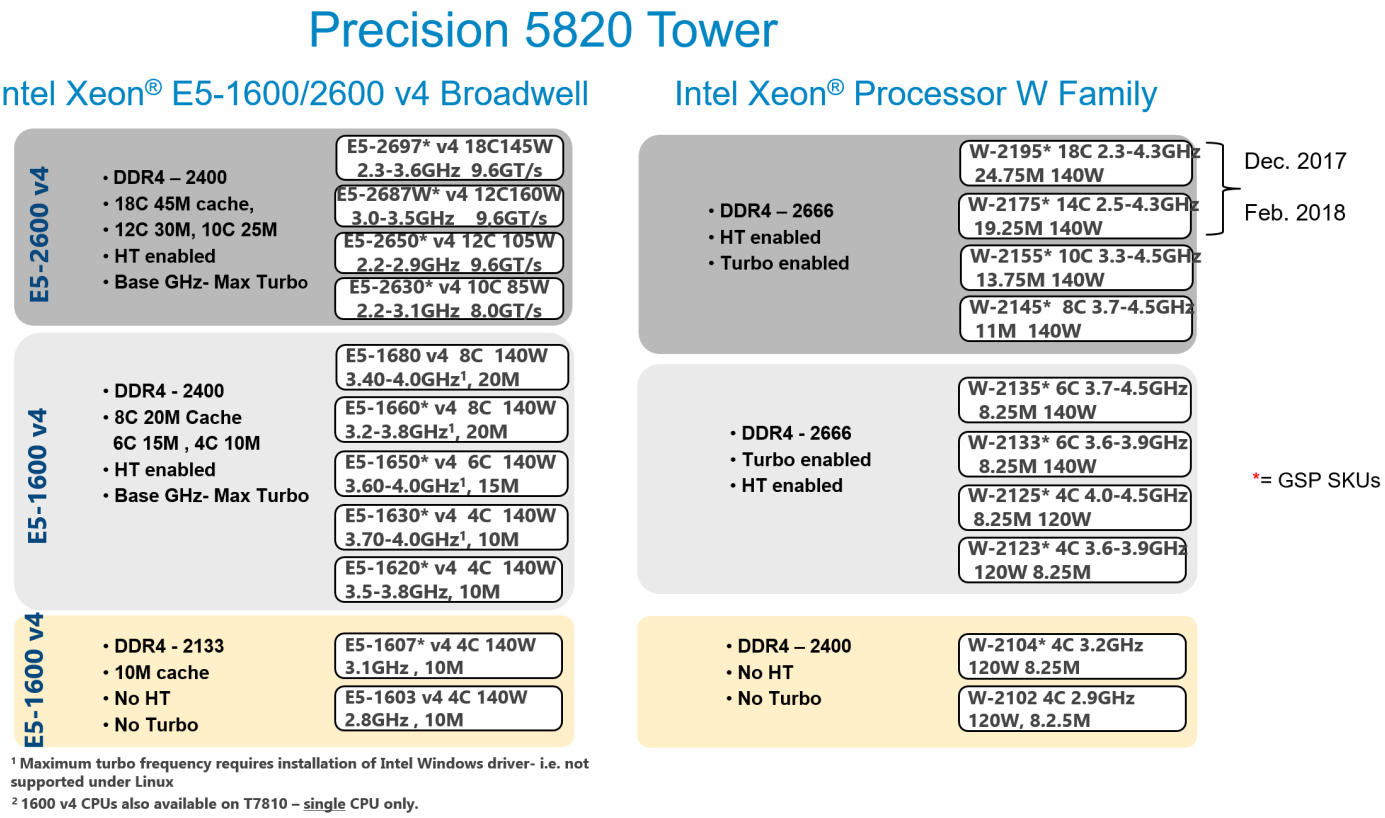
Chipset	Intel C621 Chipset (C620 Series) <— Tower 7820 Intel C422 Chipset <— Tower 5820
Non-volatile memory on chipset	
BIOS Configuration SPI (Serial Peripheral Interface)	256Mbit (32MB)
TPM 1.2 Security Device (Trusted Platform Module)[1] TPM 2.0 ships and is supported with Windows 10 only Note: All 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

5820 TOWER PROCESSORS— INTEL XEON PROCESSOR W FAMILY TRANSITIONING FROM T5810 E5-1600 V3/V4 SERIES

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 two entry CPU SKUs W02102 and W-2104 .

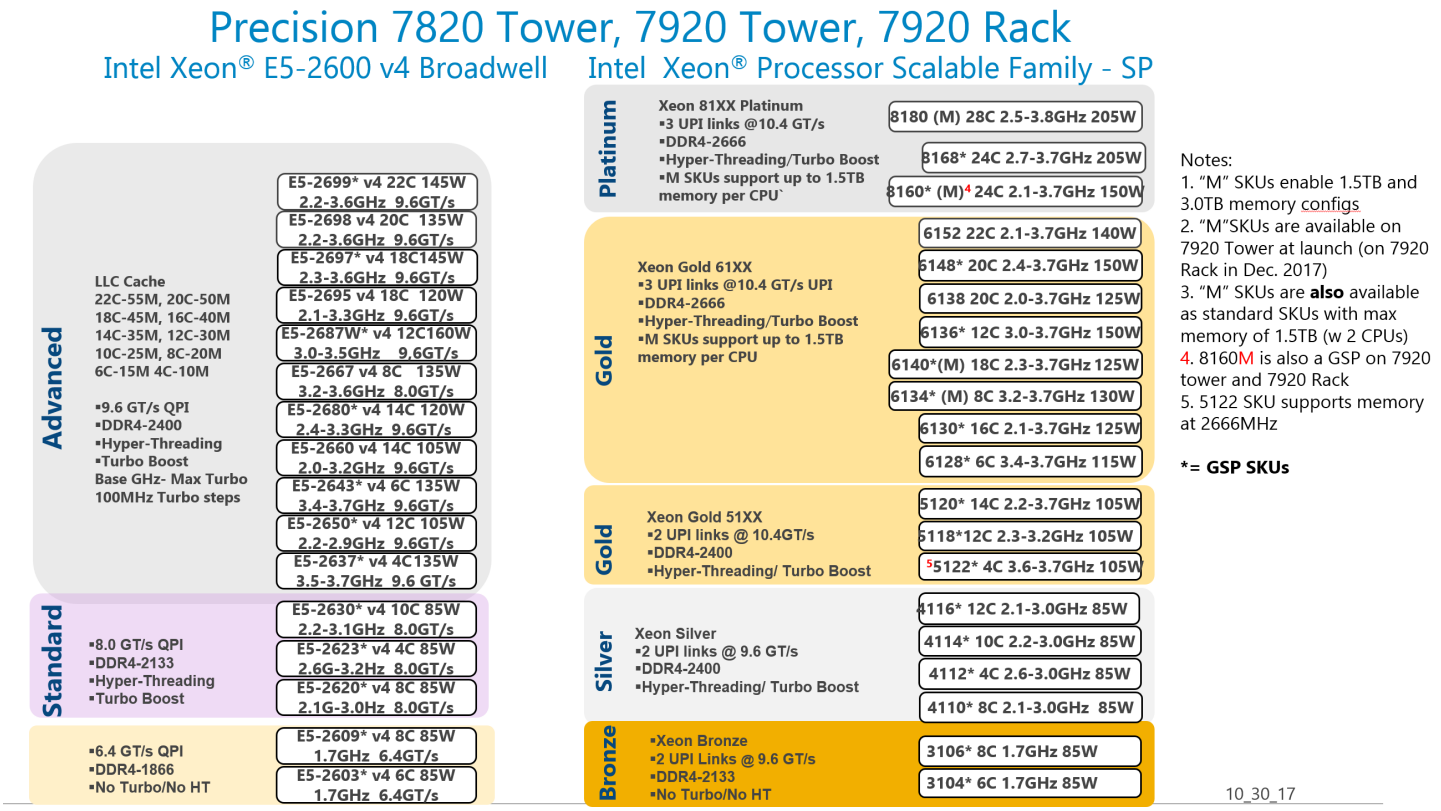


7820 TOWER PROCESSORS— INTEL XEON SCALABLE PROCESSOR FAMILY- SP TRANSITIONING FROM T7810 E5-2600 V3/V4 SERIES

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.



Notes:
1. "M" SKUs enable 1.5TB and 3.0TB memory configs
2. "M"SKUs are available on 7920 Tower at launch (on 7920 Rack in Dec. 2017)
3. "M" SKUs are **also** available as standard SKUs with max memory of 1.5TB (w 2 CPUs)
4. 8160M is also a GSP on 7920 tower and 7920 Rack
5. 5122 SKU supports memory at 2666MHz

***= GSP SKUs**

MEMORY

Note: The Precision 5820 Tower workstation has a four channel memory bus architecture. Dell recommends that all four memory channels be populated with DIMMS for maximum memory performance. The 5820 supports Dell Reliable Memory Technology Pro which virtually eliminates memory errors.

Note: With certain processors, 2666MHz DDR4 ECC RDIMM memory will scale down to 2400MHz . See processor page for details.

Type:	DDR4 SDRAM RDIMM ECC
Max Frequency	2666/2400MHz
DIMM Slots	8
DIMM Capacities	8GB, 16GB, 32GB RDIMM
Minimum Memory Offered	16GB (2x 8GB) (1 DIMM config was validated)
Maximum System Memory	256GB

FACTORY INSTALLED MEMORY CONFIGURATIONS:

Note: Other configurations are possible via CFI or memory customer kits, but are not available as standard factory installed options.

5820 Tower Memory				CPU0							
				iMC1				iMC0			
				Ch3		Ch2		Ch0		Ch1	
				0	1	0	1	1	0	1	0
Config	Total (GB)	DPC	Frequency	DIMM2	DIMM6	DIMM4	DIMM8	DIMM7	DIMM3	DIMM5	DIMM1
S16R	16	1DPC	2666	8							8
S32R	32	1DPC	2666	8		8			8		8
S64R	64	1DPC	2666	8	8	8	8	8	8	8	8
S32Rb	32	1DPC	2666	16							16
S64R	64	1DPC	2666	16		16			16		16
S128R	128	1DPC	2666	16	16	16	16	16	16	16	16
S128R	128	1DPC	2666	32		32			32		32
S192R	192	1DPC	2666	32	32	32			32	32	32
S192R	192	1DPC	2666	32	16	32	16	16	32	16	32
S256R	256	1DPC	2666	32	32	32	32	32	32	32	32

[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.

MEMORY

Note: The Precision 7820 Tower workstation has a six channel memory bus architecture and two memory controllers per CPU. Dell recommends that all six memory channels be populated with DIMMS for maximum memory performance. The 7820 supports Dell Reliable Memory Technology Pro which virtually eliminates memory errors.

Note: With certain processors, 2666MHz DDR4 ECC RDIMM/LRDIMM memory will scale down to 2400MHz or 2133MHz. See processor page for details.

Type:	DDR4 SDRAM RDIMM/LRDIMM ECC
Max Frequency	2666/2400/2133MHz
DIMM Slots	12 (6 per CPU)
DIMM Capacities	8GB, 16GB, 32GB RDIMM,
Minimum Memory Offered	16GB (2x 8GB) per CPU (1 DIMM per CPU validated)
Maximum System Memory	384GB

FACTORY INSTALLED MEMORY CONFIGURATIONS:

Note: Other configurations are possible via CFI or memory customer kits, but are not available as standard factory installed options.

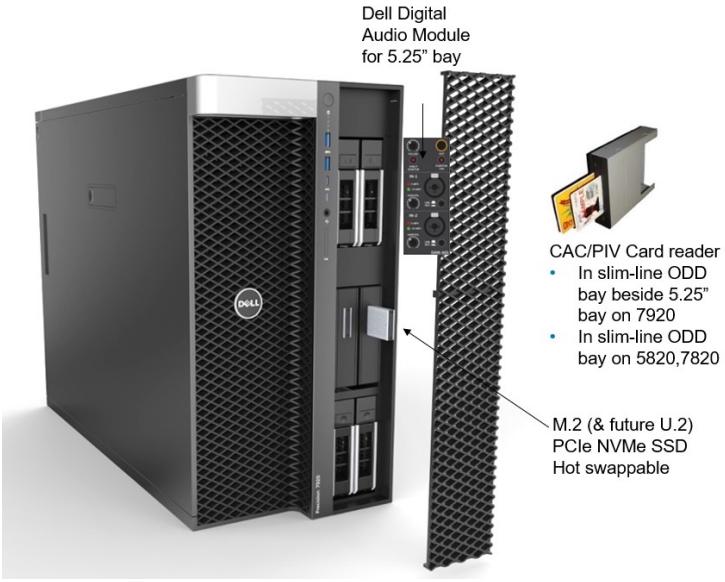
7820 Tower Memory				CPU0												CPU1											
				iMC1						iMC0						IMC0						IMC1					
				Ch5		Ch4		Ch3		Ch0		Ch1		Ch2		Ch5		Ch4		Ch3		Ch0		Ch1		Ch2	
				0	1	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0
Config	Total (GB)	DPC	Frequency	DIMM2		DIMM4		DIMM6			DIMM5		DIMM3		DIMM1	DIMM2		DIMM4		DIMM6			DIMM5		DIMM3		DIMM1
S16R	16	1DPC	2666	8											8												
S32R	32	1DPC	2666	8		8							8		8												
S48R	48	1DPC	2666	8		8		8			8		8		8												
S32Rb	32	1DPC	2666	16											16												
S64R	64	1DPC	2666	16		16							16		16												
S96R	96	1DPC	2666	16		16		16			16		16		16												
S192R	192	1DPC	2666	32		32		32			32		32		32												
D32R	32	1DPC	2666	8											8	8											8
D64R	64	1DPC	2666	8		8							8		8	8		8								8	8
D96R	96	1DPC	2666	8		8		8			8		8		8	8		8		8			8			8	8
D64R	64	1DPC	2666	16											16	16											16
D128R	128	1DPC	2666	16		16							16		16	16		16								16	16
D192R	192	1DPC	2666	16		16		16			16		16		16	16		16		16			16			16	16
D256R	256	1DPC	2666	32		32							32		32	32		32								32	32
D384R	384	1DPC	2666	32		32		32			32		32		32	32		32		32			32			32	32

[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.

5820/7820 TOWER FLEXBAY STORAGE

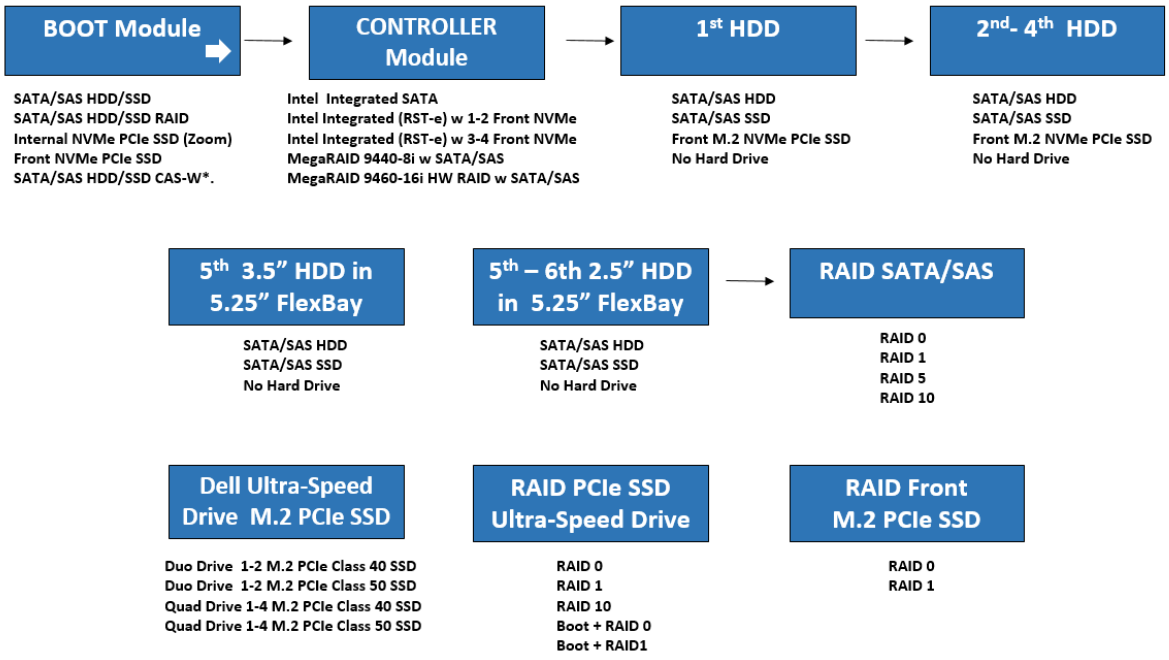
5820/7820 Tower – FlexBay Options

- **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 FlexBays can support M.2 PCIe NVMe SSDs via M.2 carrier with hot swap up to 2 drives
    - FlexBay 1 is default for 1st and 2nd M.2 PCIe NVMe SSDs
- **FlexBay 2** is a 5.25" bay for HH Optical Drives, Dell Digital Audio I/F and converts to support a 5th 3.5" SATA/SAS drive or 5th and 6th 2.5" SATA/SAS drive
- **Slimline bay supports:**
  - Slimline Opticals
  - CAC/PIV Smart Card Reader



5820,7820 TOWER - CONFIGURING STORAGE

5820,7820 Tower Storage Configuration Path & NVMe options



GRAPHICS

NOTE: The systems support full height (FH) cards. Up to 4 single wide or 3 double wide graphics cards can be supported with the 2nd CPU installed (adds two additional PCIe Gen 3.0 x16 slots)
NOTE: Dual Graphics with NVIDIA SLI (Scalable Link Interface) options available with select cards.

Graphics Options	
High End 3D Cards	
Options	Aux power dongle required
Radeon Pro WX 9100	1x8 pin
Radeon Pro SSG (future)	1x6 pin; 1x8 pin
NVIDIA Quadro GP100	1x8 pin
NVIDIA Quadro P6000	1x8 pin
NVIDIA Quadro P5000	1x8 pin
Mid-range 3D Cards	
Options	Aux power dongle required
Radeon Pro WX 7100	1x6 pin
Radeon Pro WX 5100	
Radeon Pro WX 4100	
NVIDIA Quadro P4000	1x6 pin
NVIDIA Quadro P2000	
Entry 3D Cards	
Options	Aux power dongle required
Radeon Pro WX 3100	
Radeon Pro WX 2100	
NVIDIA Quadro P1000	
NVIDIA Quadro P600	
NVIDIA Quadro P400	
Professional 2D Cards	
Options	Aux power dongle required
NVIDIA NVS 310	
NVIDIA NVS 315	

BAYS, DRIVES AND OPTICAL STORAGE OPTIONS

Bays:	
2x FlexBays and 1x 5.25” FlexBay supporting up to 5x 3.5” or 6x 2.5” drives	5
Hard Drives Supported - 3.5” or 2.5”	5x 3.5” or 6x 2.5”
Front FlexBay Access M.2 PCIe NVMe SSDs supported	2
Internal M.2 PCIe NVMe SSDs supported on Dell Ultra-Speed Drive PCIe cards	4 on Dell Ultra-Speed Drive Quad
Slimline Optical Bay	1
Optical Drives Supported	1x slimline, 1x HH
Interface:	
Integrated: Intel® chipset SATA controller (6Gb/s) Optional: Broadcom MegaRAID® SAS/SATA PCIe Controllers	8 +2 SATA ports
3.5” Hard Drives:	
4TB[1] SAS 7200 RPM nearline HDD	X
4TB[1] SATA 5400 RPM HDD	X
2TB[1] SATA 7200 RPM HDD	X
1TB[1] SATA 7200 RPM HDD	X
500GB[1] SATA 7200 RPM HDD	X Post RTS
2.5” Hard Drives:	
2.5” 1TB SATA 7200 RPM HDD	X
2.5” 500GB SATA 7200 RPM HDD	X
2.5” 500GB SATA 7200 RPM Opal SED HDD	X Post RTS
2.5” 1.8GB SAS 12Gb/s 10K RPM HDD	X Post RTS
2.5” 900GB SAS 12Gb/s 15K RPM HDD	X Post RTS
2.5” 600GB SAS 12Gb/s 15K RPM HDD	X
2.5” 300GB SAS 12Gb/s 15K RPM HDD	X

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

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	X
5.25” DVD+/-RW[1] SATA 1.5Gbit/s	X
Media Card Reader:	
Front panel—integrated	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” SAS SSDs	
2.5" 800GB[1] SAS 12Gbps Enterprise Solid State Drive	X
2.5" 400GB[1] SAS 12Gbps Enterprise Solid State Drive	X
2.5” SATA SSDs:	
2.5" 1TB SATA Class 20 Solid State Drive	X Post RTS
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 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 Post RTS
M.2 512GB PCIe NVMe Class 40 SED Solid State Drive	X Post RTS

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

Dell SSD classifications

	Class	Sequential* Read/Write	Random** Read/Write	Interface
SATA	10 “value”	520K/320K	30K/10K	SATA interface reduced features e.g. dram-less Consumer Offering
SATA	20 “mainstream”	500K/300K	80K/60K	SATA Interface full feature set Consumer, Commercial
SATA	30 “performance”	550K/350K	90K/75K	Best in class SATA Precision Only
PCIe	40 “performance”	1500/350K	200K/80K	PCIe interface NVMe host protocol Consumer, Commercial Performance
PCIe	50 “performance”	2100K/1200K	300K/100K	Best in class PCIe Precision Only

Based on Dell internal testing, January 2016, using IOMeter. Actual performance will vary with configuration, usage and manufacturing variability.

Note: Capacity 256GB, typical values, results may vary

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

**Random = random tasks such as file search

Storage Reliability & Endurance Summary

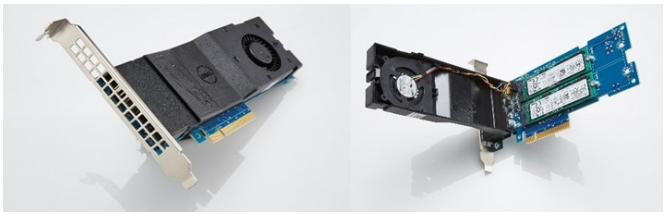
Category	Capacity	SATA HDD	SATA Value, Mainstream Class 10,Class 20	SATA Performance Class 30	PCIe NVME Mainstream Class 40	PCIe NVMe Performance Class 50
SSD Endurance (TBW)	128GB		72			
	256GB		72	150	72	150
	360GB		72			
	512GB		72	292	72	292
	1TB		72		72	
Reliability (MTBF hours)	All SSD		800,000	1,200,000	800,000	1,200,000
	ALL HDD	550,000				

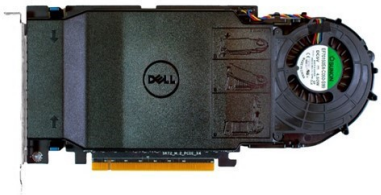
Endurance is a measure of SSD life , how much data can be written for how long – measured in Terabytes Written, TBW, our SSD's are specified for TBW over a 5 year lifecycle

Reliability is measured in Mean Time Between Failures , MTBF units = hours

Values shown are minimum required – Dell Internal Engineering Specification.

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	
Maximum Capacity	2x 1TB	4x 1TB
System Requirements:		
System Board Connection	PCIe Gen3 X8	PCIe Gen3 X16
Form Factor	HHHL	FHFL
OS	Win 7, 8.1, 10; RHEL, Ubuntu 14.04	
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	

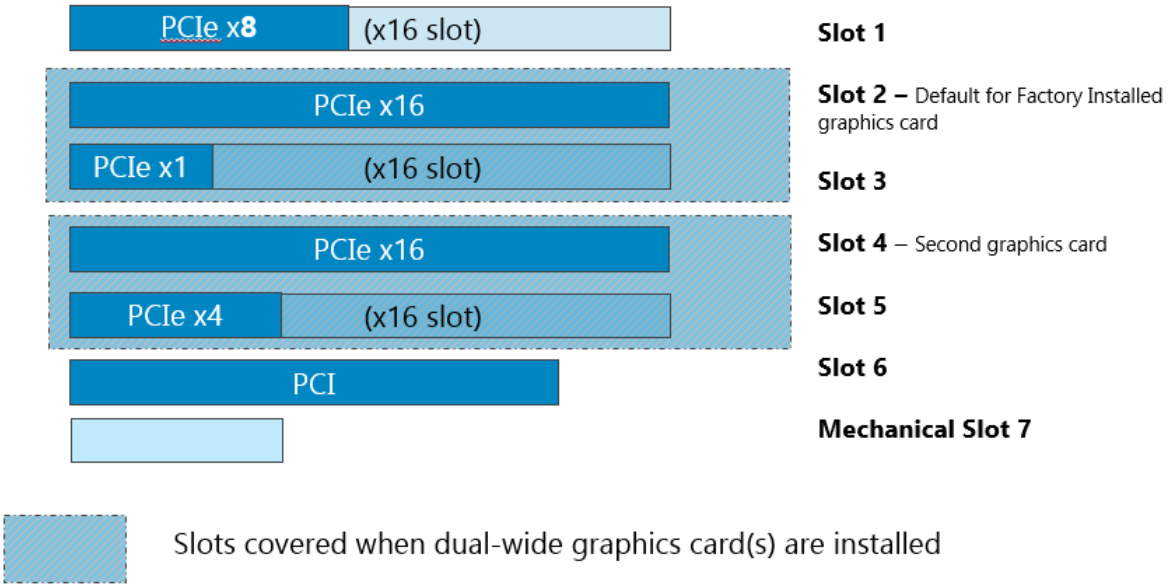
SYSTEM EXPANSION SLOTS

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

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

PCIe x16 Slot Gen 3	2 (Slots 2 and 4)
PCIe x16 (wired x8)	1 (Slot 1)
PCIe x16 Slot (wired x4)	1 (Slot 5)
PCIe x16 Slot (wired x1)	1 Slot 3)
PCI 32/33 Slot, (32bit mechanically only)	1 (Slot 6)
SATA connectors for hard drives and optical drive	8

5820 Tower / 7820 Tower Slot Layout



EXTERNAL PORTS/CONNECTORS

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

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 Option at point of sale or 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
Broadcom MegaRAID® 9460-16i SAS 12Gb/s (SATA 6Gb/s) controller with 16 ports and 4GB cache memory with Flash module/Super Cap backup. Hardware based RAID 0, 1, 5, 10.	Optional PCIe x8 card

COMMUNICATIONS - NETWORK

Intel® i219 Gigabit Ethernet LAN 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
Dell Digital Audio Interface	Optional module (USB) installed in 5.25” FlexBay Post RTS
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 Multimedia Keyboard - KB216	Optional
Dell Optical Mouse - MS116	Optional
Dell KB813 Smartcard Keyboard	Optional
Dell Wireless Keyboard and Mouse - KM636	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
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
CAC/PIV Smart Card Reader—fits into slim-line bay	Optional

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

SECURITY SOFTWARE

Dell Data Protection | Security Tools (DDP | ST)	Standard
Dell Data Protection | Encryption (DDPE)	Optional

MISC. SOFTWARE

Dell Precision Optimizer V4.0	Included at no charge
Intel CAS W (Cache Acceleration Software - requires 256GB SSD Caching Drive (non-boot)	Optional

SERVICE AND SUPPORT

NOTE: For more details on Dell Service Plans please to go to: www.dell.com/service/service_plans

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)	33.66 l
Chassis Weight (pounds/kilograms)	29.10 lbs / 13.2 kg
Chassis Dimensions: (HxWxD)	
Height (inches/centimeters)	16.30 in / 41.40 cm
Width (inches/centimeters)	6.79 in / 17.25 cm
Depth (inches/centimeters)	18.54 in / 47.09 cm
Shipping Weight (pounds/kilograms - includes packaging materials)	42.17 lbs / 19.13 kg
Packaging Parameters (HxWxD)	
Height (inches/centimeters)	15.31 in / 38.89 cm
Width (inches/centimeters)	24.25 in / 61.60 cm
Depth (inches/centimeters)	21.63 in / 54.94 cm

SYSTEM EXPANSION SLOTS

Slot	Type	Voltage supported	Max Height (in,cm)	Max Length (in, cm)	Max Watt-age	Cards supported
1	PCIe x16 (x8) Gen3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Half Length 6.6 in / 16.77 cm	25	Storage, UltraSpeed Duo, Tera2 Host Card, 10G NIC
2	PCIe x16 Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	250*	Graphics
3	PCIe x16 (x1) Gen 3	3.3V / 12V	Standard Height 4.38 in / 11.13 cm	Full Length 12.28in / 31.20cm	10	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	250**	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
6	PCI 32[1]	3.3V / 5V / 12V / -12V	Standard Height 4.20in / 10.67cm	Full Length 12.28in / 31.20cm	25	

*Requires optional power supply (685W/825W for Tower 5810, 825W for Tower 7810, with 2 x 6 pin supplementary power connectors or 1 x 8 pin with M6000). **Requires optional 825W power supply for Tower 5810 to support 2nd 250W graphics in slot 4 which comes with 2 x 6 pin & 1 X 8 pin [with 2 x 6 pin splitter] aux power connectors. Total graphics power allowed in a single slot (T5810/825W) is 250W *. Total graphics power allowed in Tower 7810 system with high end PSU is 300W in two slots.

[1]32 bit mechanically only. No PCI-X cards support.

SYSTEM LEVEL ENVIRONMENTAL AND OPERATING CONDITIONS, PSU

Temperature	
Operating	5° to 35° C (41° to 95° F)
Non-Operating (Storage)	-40° to 65° C (-40° to 149° F)
Relative Humidity (Operating)	8% to 85% (non-condensing)
Relative Humidity (Storage)	5% to 90% (non-condensing)
Maximum vibration	
Operating	0.52 Grms, 5 to 350 Hz
Non-Operating	2.0 Grms, 5 to 500 Hz
Maximum Shock	
Operating	40G Half Sine 2.5 ms pulse
Non-Operating	40G Half Sine 2.5 ms pulse
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. If you have questions, please contact the manufacture to confirm the output type.

	Entry 5820 Tower	5820 Tower/ 7820 Tower
Power Supply Wattage	425W	950W
AC input Voltage Range	100—240VAC	100—240VAC
AC input current (low ac range/high AC range)	6A	13.0A / 6.5A
AC input Frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
AC holdup time (80% load)	16 MSEC	16 MSEC
Average Efficiency (Energy Star 5.0 Compliant)	87 – 90 – 87% @ 20 – 50 – 100% load	87 – 90 – 87% @ 20 – 50 – 100% load
PCI–e supplementary power connectors included	None	6+2 Pin (2) 5820 Tower 6+2 Pin and 6 Pin 7820 Tower

POWER (CONT), HDD CONTROLLERS

	Entry 5820 Tower	5820 Tower / 7820 Tower
DC parameters		
+12.0v output	31.51A	79.16A
+12.0v auxiliary output	5A	5A
-12.0v output	0.5A	0.5A
Max total power	425W	950W
BTUs/h (based on PSU max wattage)	1450 BTU	3241.5 BTU
Power Supply Fan	60* 25mm (2)	60*25mm (2)
Compliance:		
0.5 watt requirement	Yes	Yes
Climate Savers / 80Plus Compliant	Yes	Yes
FEMP (CECP) Standby Power Compliant	Yes	Yes

3.0V CMOS BATTERY

Brand	Type	Voltage	Composition	Life
PANASONIC	CR-2302L/BE	3V	Lithium	Continuous Discharge Under 15 kΩ Load to 2.5V End-Voltage: 1100 hours or longer
MITSUBISHI	CR2302	3V	Lithium Manganese Dioxide	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	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	Same as System
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	Sam 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 32/64, Windows 8.1 64, Red Hat Linux 7.0,
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 64, Windows 10 64,
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-C 3.1 10G & DISPLAYPORT ALT-MODE PCI EXPRESS HOST CARD	
External Connector Type	2 x USB-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 connector	PCIe Gen3 x1
Power from USB-3	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 32/64, Windows 8.1 64 Red Hat Linux 7.0

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 32/64, Windows 8.1 / Windows 10 64
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 32/64, Windows 8.1/Win 10 64 Red Hat Linux 7.0, 7.2

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 32/64, Windows 8.1/Win 10 64 Red Hat Linux 7.0, 7.2, 7.3

GRAPHICS

NVIDIA NVS 310	
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	
PCIe support	x16 Gen2
Max Resolution (# of DisplayPorts used)	2560x1600 (DisplayPort) 1920x1200 (using DP to DVI-I video adaper)
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	two DisplayPorts 1.1
Included video adapters (with systems or customer kits)	2 DisplayPort to SL-DVI-I
Aux power connectors needed	None
Maximum power	19.5 W

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 P600	
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)	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	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 3100	
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	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 (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 P2000	
PCIe slot width	1
Memory (GDDR5)	5 GB
Open GL	4.5
Open CL	
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 (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 P4000	
PCIe slot width	1
Memory (GDDR5)	8 GB
Open GL	4.5
Open CL	
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 (4 @ 120Hz)
Max # of 5120x2880 pixel displays @ 60hz	4
Max # of 7280x4320 pixel displays @ 60hz	0
Video connectors	four DisplayPorts 1.4 One stereo (optional)
Included video adapters (with systems or customer kits)	None
Aux power connectors needed	None
Maximum power	105 W

GRAPHICS

RADEON PRO WX 4100	
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	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	5120x2880 30bpp @ 60hz
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	50 W

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 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

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

RADEON PRO SSG	
PCIe slot width	2
Memory (GDDR5)	2TB SSD + 16 GB HBM2
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	275 W

GRAPHICS

NVIDIA QUADRO P5000	
PCIe slot width	2
Memory (GDDR5)	16GB GDDR5X
Open GL	4.5
Open CL	2.0
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 24bpp @120hz (four DisplayPorts) 7680x4320 24bpp @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	4
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	One Dual Link DVI-I Four DisplayPorts One Stereo (optional) SYNC connector
Included video adapters (with systems or customer kits)	None
card to card connectors	SLI bridge
PCIe Aux power connectors needed	8-pin
Maximum power	180 W

GRAPHICS

NVIDIA QUADRO P6000	
PCIe slot width	2
Memory (GDDR5)	24GB GDDR5X
Open GL	4.5
Open CL	
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 24bpp @120hz (four DisplayPorts) 7680x4320 24bpp @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	4
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	One Dual Link DVI-I Four DisplayPorts One Stereo (optional) SYNC connector
Included video adapters (with systems or customer kits)	None
card to card connectors	SLI bridge
PCIe Aux power connectors needed	8-pin (ships with an adapter for 8pin to dual PCIe 6-pin for system power)
Maximum power	250W

GRAPHICS

NVIDIA QUADRO GP100	
PCIe slot width	2
Memory (GDDR5)	16 GB HMB2
Open GL	4.5
Open CL	
DirectX	12.0
Vulcan	1.0
PCIe support	x16 Gen3
Max Resolution (# of DisplayPorts used)	7680x4320 24bpp @120hz (four DisplayPorts) 7680x4320 24bpp @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	4
Max # of 7280x4320 pixel displays @ 60hz	1 (dual DP cables)
Video connectors	One Dual Link DVI-I Four DisplayPorts One Stereo (optional) SYNC connector
Included video adapters (with systems or customer kits)	None
card to card connectors	1 or 2 NVLink
PCIe Aux power connectors needed	8-pin (ships with an adapter for 8pin to dual PCIe 6-pin for system power)
Maximum power	235W

HARD DRIVES[1]

3.5” 500GB SATA 7200 RPM HDD POST RTS	
Capacity (bytes)	500,107,862,016
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	SATA Up to 6Gb/s
Internal buffer size	16 MB NCQ
Rotational Speed	7200 RPM
Logical Blocks	976,773,168
Power Source	
Power Consumption (reference only)	Idle 5.0W, Active 10.0W
Spin Up Current (reference only)	5V (1A) ,12V (2A)

3.5” 1TB SATA 7200 RPM HDD	
Capacity (bytes)	1,000,204,886,016
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	SATA Up to 6Gb/s
Internal buffer size	32 MB NCQ
Rotational Speed	7200 RPM
Logical Blocks	1,953,525,168
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.

HARD DRIVES[1]

3.5” 2TB SATA 7200 RPM HDD	
Capacity (bytes)	2,000,398,934,016
Dimensions inches (W x D x H)	Approximately (4.00 x 5.787 x 1.028 inches)
Interface type and Maximum speed	SATA Up to 6Gb/s
Internal buffer size	32 MB NCQ
Rotational Speed	7200 RPM
Logical Blocks	3,907,029,168
Power Source	
Power Consumption (reference only)	Idle 5.0W, Active 10.0W
Spin Up Current (reference only)	5V (1A) ,12V (2A)

3.5” 4TB SATA 5X00 RPM HDD	
Capacity (bytes)	4TB
Dimensions inches (W x D x H)	4 x 5.79 x 1.028
Interface type and Maximum speed	6Gbps SATA3
Internal buffer size	64MB
Average Seek Time	12ms
Rotational Speed	5X00 RPM
Logical Blocks	7,814,037,168
Power Source	
Power Consumption (reference only)	Idle 5W, Active 10 W
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.

HARD DRIVES[1] (CONT.)

2.5" 500GB SATA 7200 RPM HDD	
Capacity (bytes)	500,107,862,016
Dimensions inches (W x D x H)	Approximately (2.75 x 3.94 x 0.374 inches)
Interface type and Maximum speed	SATA Up to 3Gb/s
Internal buffer size	16 MB
Rotational Speed	7200 RPM
Logical Blocks	976,773,168
Power Source	
Power Consumption (reference only)	Idle 0.70W, Active 3.25W
Spin Up Current (reference only)	5V (1000 mA)

2.5" 500GB[1] SATA 7,200 RPM OPAL SED WITH FIPS HDD	
Capacity (bytes)	500GB
Dimensions inches (W x D x H)	2.75 x 3.95 x 0.278
Interface type and Maximum speed	6Gbps SATA3
Internal buffer size	16MB
Rotational Speed	5400RPM
Logical Blocks	976,773,168
Power Source	
Power Consumption (reference only)	Idle 0.7W, Active 3.25W
Spin Up Current (reference only)	5V (1A)

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

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.

HARD DRIVES[1] (CONT.)

2.5" 900GB SAS 15K RPM HDD - POST RTS	
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

2.5" 1.8TB SAS 10,000 RPM HDD - POST RTS	
Capacity (bytes)	1.8TB
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.

HARD DRIVES[1] (CONT.)

3.5” 4TB SAS 7.2k RPM 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.

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)/ 12.7mm (0.5 in)/ 126.1mm (4.97in)	128.0 mm (5.04)/ 12.7mm (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 w/PXE
	Serial Port	COM1
	SATA Operation	RAID On
	SATA Drives	(All enabled by default)
	PCIE Drives	(All enabled by default)
	SMART Reporting	Disabled
	USB Configuration	Boot Support Enabled Front/Rear/Internal Ports Enabled
	Front USB Configuration	All Front ports enabled
	Rear USB Configuration	All Rear ports enabled
	Internal USB Configuration	Internal port enabled
	Thunderbolt Adapter Configuration	(depends on presense of Thunderbolt AIC)
	USB PowerShare	Disabled
	Audio	Enabled
	Memory Map IO above 4GB	Enabled
	HDD Fans	(depends on system configuration)
	Miscellaneous Devices	PCI Slot and SD Card enabled SD Card Boot disabled SD Card Read-Only Mode disabled
	Intel VMD Technology	Enabled
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 Password	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

BIOS DEFAULTS (CONT.)

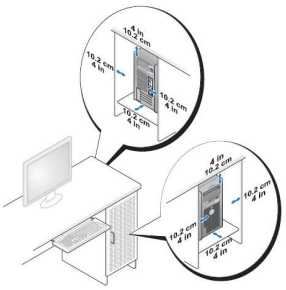
Power Management	AC Recovery:	Power Off
	Auto On Time:	Disabled
	Deep Sleep Control:	Disabled
	Fan Speed Control:	Auto
	USB Wake Support	Disabled
	Block Sleep	Disabled
	Wake on LAN:	Disabled

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

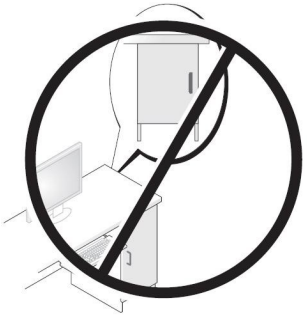
Leave a 10.2 cm (4 in.) minimum clearance on all vented sides of the computer to permit the airflow required for proper ventilation.

ENCLOSURE DOOR AREA

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

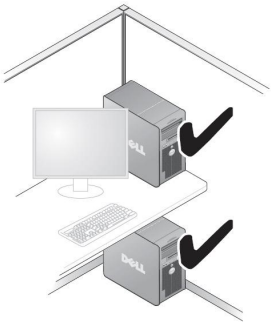
RECOMMENDED ENCLOSURE

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.
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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.