

## Statement of Volatility – Dell PowerEdge R360

Dell PowerEdge R360 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. Components chosen as user-definable configuration options (those not soldered to the motherboard) are not included in the Statement of Volatility. Configuration option information (pertinent to options such as microprocessors, remote access controllers, and storage controllers) is available by component separately. The following NV components are present in the PowerEdge R360 server.

Item	Non-Volatile or Volatile	Quantity	Reference Designator	Size	Type (e.g. Flash PROM, EEPROM)	Can user programs or operating system write data to it during normal operation?	Purpose? (e.g. boot code)	How is data input to this memory?	How is this memory write protected?	How is the memory cleared?
<b>Planar</b>										
PCH Internal CMOS RAM	Non-Volatile	1	U_PCH1	256 Bytes	Battery-backed CMOS RAM	No	Real-time clock and BIOS configuration settings	BIOS	N/A – BIOS only control	1) Set NVRAM_CLR jumper to clear BIOS configuration settings at boot and reboot system. 2) Power off the system, remove coin cell battery for 30 seconds, replace battery and then power back on. 3) Restore default configuration in F2 system setup menu.
BIOS SPI Flash	Non-Volatile	1	U6	32 MB	SPI Flash	No	Boot code, system configuration information, UEFI	SPI interface via PCH	Software write protected	Not possible with any utilities or applications and system is not functional if corrupted or removed.

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							environment, ME			
BIOS Data SPI Flash	Non-Volatile	1	U3	4 MB	SPI Flash	No	4MB Data SPI ROM storage BIOS setting.	SPI interface via PCH	Software write protected	Not possible with any utilities or applications and the system is not functional if BIOS SPI is corrupted or removed.
iDRAC SPI Flash	Non-Volatile	1	U7	4 MB	SPI Flash	No	iDRAC Uboot (boot loader), server management persistent store (i.e. iDRAC boot variables), and virtual planar FRU	SPI interface via iDRAC	Embedded iDRAC subsystem firmware actively controls sub area based write protection as needed.	The user cannot clear memory completely. However, user data, lifecycle log and archive, SEL, and firmware image repository can be cleared using Delete Configuration and Retire System, which can be accessed through the Lifecycle Controller interface.
iDRAC EMMC	Non-Volatile	1	U21	8 GB	eMMC NAND Flash	No	Operational iDRAC FW, Lifecycle Controller (LC) USC partition, LC service diags, LC	NAND Flash interface via iDRAC	Embedded FW write protected	The user cannot clear memory completely. However, user data, lifecycle log and archive, SEL, and firmware image repository can be cleared

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							OS drivers, USC firmware, iDRAC MAC Address, and EPPID, rac log, System Event Log, lifecycle log cache			using Delete Configuration and Retire System, which can be accessed through the Lifecycle Controller interface.
iDRAC DDR4	Volatile	1	U_IDRAC9_DRAM1	8Gb	RAM	Yes	iDRAC RAM	iDRAC firmware	Not write-protected	Remove AC
System CPLD RAM	Volatile	1	U5802	432 kb	RAM	No	Not utilized	Not utilized	Not accessible	Not accessible
System CPLD Flash	Non-Volatile	1	U5802	448 kb	FLASH	No	Power on System Firmware	Firmware update	BIOS Security Protocols	Not user clearable
System Memory: UDIMM	Volatile	Up to 4	DIMM1A DIMM2A DIMM1B DIMM2B	Up to 32GB per DIMM	RAM	Yes	System OS RAM	System OS	OS Control	Reboot or power down system
CPU PVCC_CO RE Regulators	Non-Volatile	2	PAAU1	64KB	OTP (one time programmable)	No	Operational parameters	Once values are loaded into register space a cmd writes to nvm.	There are passwords for different sections of the register space	The user cannot clear memory.

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<b>4x3.5" 1U SAS/SATA Backplane</b>										
SEP internal flash	Non-Volatile	1	U46	Flash: 512KB  Data SRAM : 256KB  Battery Powered Storage SRAM : 64B	Integrated Flash + Data SRAM + Battery Powered Storage SRAM	No	Firmware + FRU	I2C interface via iDRAC	Program write protect bit	Not user clearable
<b>8x2.5" 1U SAS/SATA Backplanes</b>										
SEP internal flash	Non-Volatile	1	U46	Flash: 512KB  Data SRAM : 256KB	Integrated Flash + Data SRAM + Battery Powered Storage SRAM	No	Firmware + FRU	I2C interface via iDRAC	Program write protect bit	Not user clearable

Item	Non-Volatile or Volatile	Quantity	Reference Designator	Size	Type (e.g. Flash PROM, EEPROM)	Can user programs or operating system write data to it during normal operation?	Purpose? (e.g. boot code)	How is data input to this memory?	How is this memory write protected?	How is the memory cleared?
				Battery Powered Storage SRAM : 64B						

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<b>H755 PERC Adapter</b>										
SDRAM	Volatile	9	U1077~U1085	8GB	SDRAM	No	Cache for HDD I/O	ROC writes to this memory - using it as cache for data IO to HDDs	no write protected. Not visible to Host Processor	Cache can be cleared by powering off the card
NV Flash	Non-volatile	1	U1100	512Gb	SPI Flash	No	Card firmware	Pre-programmed before	no write protected. Not visible to Host Processor	User cannot clear the memory.

Item	Non-Volatile or Volatile	Quantity	Reference Designator	Size	Type (e.g. Flash PROM, EEPROM)	Can user programs or operating system write data to it during normal operation?	Purpose? (e.g. boot code)	How is data input to this memory?	How is this memory write protected?	How is the memory cleared?
								assembly. Can be updated using Dell/LSI tools		
BMU	Non-Volatile	1	U1126	180KB	Integrated Flash + EEPROM	No	Battery Management Control	ROC may program data during FW and during boot during battery detection	Not write protected  Not visible to host CPU	User cannot clear this memory
SPI Flash	Non-Volatile	1	U1086	128Mb	SPI Flash	No	Holds cache data during power loss	FPGA backs up DDR data to this device in case of a power failure	no write protected. Not visible to Host Processor	Flash can be cleared by powering up the card and allowing the controller to flush the contents to VDs. If the VDs are no longer available, cache can be cleared by going into controller BIOS and selecting Discard Preserved Cache.
NVSRAM	Non-volatile	1	U1087	128KB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	no write protected. Not visible to Host Processor	User cannot clear the memory.

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FRU	Non-volatile	1	U1019	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	no write protected	User cannot clear the memory.
SPD	Non-volatile	1	U22	2Kb	EEPROM	No	Memory configuration data	Pre-programmed before assembly	no write protected. Not visible to Host Processor	User cannot clear the memory.
CPLD	Non-volatile	1	U1088	64kb	Flash	No	Power sequencing and Cache Offload	ROC may program data during FW update	Not write protected  Not visible to host CPU	User cannot clear this memory
<b>HBA355i Adapter</b>										
SPI Flash	Non-Volatile	1	U2	128Mb	SPI Flash	No	Card firmware	Pre-programmed before assembly. Can be updated using Dell/LSI tools	Not write protected. Not visible to Host Processor	User cannot clear the memory.
FRU	Non-volatile	1	U5	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.

Item	Non-Volatile or Volatile	Quantity	Reference Designator	Size	Type (e.g. Flash PROM, EEPROM)	Can user programs or operating system write data to it during normal operation?	Purpose? (e.g. boot code)	How is data input to this memory?	How is this memory write protected?	How is the memory cleared?
CPLD	Non-volatile	1	U23	24kb	Flash	No	Power sequencing	Controller may program data during FW update	Not write protected  Not visible to host CPU	User cannot clear this memory
<b>HBA355E</b>										
SPI Flash	Non-Volatile	1	U2	128Mb	SPI Flash	No	Card firmware	Pre-programmed before assembly. Can be updated using Dell/LSI tools	Not write protected. Not visible to Host Processor	User cannot clear the memory.
FRU	Non-volatile	1	U5	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.
CPLD	Non-volatile	1	U23	24kb	Flash	No	Power sequencing	Controller may program data during FW update	Not write protected  Not visible to host CPU	User cannot clear this memory
<b>H355 Adapter</b>										
SPI Flash	Non-Volatile	1	U2	128Mb	SPI Flash	No	Card firmware	Pre-programmed	Not write protected. Not	User cannot clear the memory.



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								before assembly. Can be updated using Dell/LSI tools	visible to Host Processor	
FRU	Non-volatile	1	U5	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.
CPLD	Non-volatile	1	U23	24kb	Flash	No	Power sequencing and Cache Offload	Controller may program data during FW update	Not write protected Not visible to host CPU	User cannot clear this memory
NVSRAM	Non-volatile	1	U3	128kB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	Not write protected Not visible to host CPU	User cannot clear this memory
<b>H755 fPERC</b>										
SDRAM	Volatile	9	U1077~U1085	8GB	SDRAM	No	Cache for HDD I/O	ROC writes to this memory - using it as cache for data IO to HDDs	no write protected. Not visible to Host Processor	Cache can be cleared by powering off the card

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NV Flash	Non-volatile	1	U1100	512Gb	SPI Flash	No	Card firmware	Pre-programmed before assembly. Can be updated using Dell/LSI tools	no write protected. Not visible to Host Processor	User cannot clear the memory.
BMU	Non-Volatile	1	U1126	180KB	Integrated Flash + EEPROM	No	Battery Management Control	ROC may program data during FW and during boot during battery detection	Not write protected  Not visible to host CPU	User cannot clear this memory
SPI Flash	Non-Volatile	1	U1086	128Mb	SPI Flash	No	Holds cache data during power loss	FPGA backs up DDR data to this device in case of a power failure	no write protected. Not visible to Host Processor	Flash can be cleared by powering up the card and allowing the controller to flush the contents to VDs. If the VDs are no longer available, cache can be cleared by going into controller BIOS and selecting Discard Preserved Cache.



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SPI Flash	Non-Volatile	1	U2	128Mb	SPI Flash	No	Card firmware	Pre-programmed before assembly. Can be updated using Dell/LSI tools	Not write protected. Not visible to Host Processor	User cannot clear the memory.
FRU	Non-volatile	1	U5	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.
CPLD	Non-volatile	1	U23	24kb	Flash	No	Power sequencing and Cache Offload	Controller may program data during FW update	Not write protected  Not visible to host CPU	User cannot clear this memory
MCU	Non-volatile	1	U41	8kB	EEPROM	No	PCIe Bifurcation information to system iDRAC	BMC may program data if there is an updated version packaged with iDRAC	Not write protected  Not visible to host CPU	User cannot clear this memory

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NVSRAM	Non-volatile	1	U3	128kB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	Not write protected  Not visible to host CPU	User cannot clear this memory

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<b>TPM</b>										
Trusted Platform Module (TPM)	Non-Volatile	1	U2	128 Bytes	EEPROM	Yes	Storage of encryption keys	Using TPM Enabled operating systems	SW write protected	F2 Setup option
<b>Power Button Control Panel (RCP)</b>										
SPI Flash	Non-Volatile	1	U2	32 Mb	SPI Flash	No	EasyRestore functionality	SPI interface from iDRAC to	Embedded iDRAC subsystem	The user cannot clear memory.

Item	Non-Volatile or Volatile	Quantity	Reference Designator	Size	Type (e.g. Flash PROM, EEPROM)	Can user programs or operating system write data to it during normal operation?	Purpose? (e.g. boot code)	How is data input to this memory?	How is this memory write protected?	How is the memory cleared?
							contains Service Tag, Copy of SEL logs	Right Cntl Panel	firmware actively controls sub area based write protection as needed.	
<b>BOSS-N1</b>										
FRU	Non-volatile	1	U4	2Kbit	EEPROM	No	Card manufacturing information	During Manufacturing , by programming the image via firmware update process. During runtime, by I2C Proprietary Command Protocol	No write protected	User cannot clear the memory.
MCU	Non-Volatile	1	U41	8kB	Flash ROM	No	BOSS-N1 information	The data is flash via iDRAC auto update	No write protected	User cannot clear the memory.
SPI flash	Non-Volatile	1	U5	128 Mb	SPI Flash EEPROM	Yes	Firmware, Boot code	Firmware and some configuration	No write protected	User cannot clear the memory.

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								data flashed via Dell Update Package (DUP); some configuration data is programmed during manufacturing ; end user configuration data is written via UEFI HII		
<b>Riser</b>										
MCU	Non-volatile	1	U1	8kB	Flash ROM	No	Riser information	The data is flash via iDRAC auto update	No write protected. Not visible to Host Processor	User cannot clear the memory.
<b>LOM</b>										
SPI Flash	Non-Volatile	1	U2001	8-Mbit DataFlash (with Extra 256-Kbits)	SPI Flash EEPROM	Yes	Firmware, configuration data	Firmware and some configuration data flashed via Dell	Reserving write protection function for HW design.	User cannot clear the memory.



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								Update Package (DUP); some configuration data is programmed during manufacturing ; end user configuration data is written via UEFI HII		
MCU	Non-Volatile	1	U5809	64KB Flash and 8KB of SRAM	Flash ROM	No	LOM Security data	Off-line programming Before production	No write protected. Not visible to Host Processor	User cannot clear the memory

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Primary MCU	Non-volatile	1	IC050	64K	Internal Flash	No	Boot code, FW	The data is flash via Dell Update Package (DUP)	SW write protected	Before firmware update, the memory will be cleared.
Secondary MCU/FRU	Non-volatile	1	IC900	128K	Internal Flash	No	Boot code, FW	The data is flash via Dell Update Package (DUP)	SW write protected	Before firmware update, the memory will be cleared.
Chicony PSU 700W										
Primary MCU	<b>Non-Volatile</b>	1	U701	128KB	Internal Flash	No	PFC, input sensor	The data is flash via Dell Update Package (DUP)	SW write protected	Before firmware update, the memory will be cleared.
Secondary MCU	<b>Non-Volatile</b>	1	U900	128KB	Internal Flash	No	LLC, protection, output sensor, PMBus	The data is flash via Dell Update Package (DUP)	SW write protected	Before firmware update, the memory will be cleared.
FRU	<b>Non-Volatile</b>	0		256B	Internal Flash	No	FRU data	During Manufacturing , by programming the image via firmware	SW write protected	Before firmware update, the memory will be cleared.

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								update process		



**NOTE:** For any information that you may need, direct your questions to your Dell Marketing contact.

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