



Statement of Volatility – Dell PowerEdge R710

The Dell PowerEdge R710 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 R710 server.

Component	Non-Volatile RAM	Volatile RAM	Reference Designator	Qty	Size	Type (e.g., Flash PROM, EEPROM)
Planar						
System BIOS SPI Flash	Y		U_SPI_BIOS	1	4MB	Flash EEPROM (SPI interface)
LOM Configuration Data	Y		U15, U16	2	512KB	FLASH (NOR)
iDRAC6 Controller ROM	Y		U_IBMC	1	4KB	ROM
iDRAC6 Controller RAM		Y	U_IBMC	1	8KB	RAM
System CPLD (EPROM)	Y		U_CPLD	1	1200 Macro cells	Internal Flash EEPROM
System CPLD (RAM)		Y	U_CPLD	1	1KB	RAM
iDRAC6 Express Internal Flash	Y		U_EMMC	1	1GB	NAND FLASH
System RAM		Y	J_CPU(2:1)_C H(2:0)_DIMM(3 :1)	18	up to 18 DIMMs *16GB	RAM
TPM ID EEPROM (Plug in module only)	Y		U_SEEPROM	1	256B	EEPROM
TPM Binding EEPROM (on China planar only)	Y		U7261	1	256B	EEPROM
iDRAC6 SDRAM		Y	U_IBMC_ME M	1	128MB	DDR2 RAM
iDRAC6 FRU	Y		U_IBMC_FR U	1	4KB	EEPROM
iDRAC6 Boot Block Flash	Y		U_IBMC_SPI	1	2MB	FLASH (NOR)

Component	Non-Volatile RAM	Volatile RAM	Reference Designator	Qty	Size	Type (e.g., Flash PROM, EEPROM)
Trusted Platform Module	Y	N	U_TPM	1	128 bytes	EEPROM
Chipset						
CMOS	Y		U_ICH9	1	256KB	Battery-backed RAM
2.5" Backplane or 3.5" Backplane						
Storage Controller Processor	Y		U_SEP	1	32KB	Embedded Microcontroller Flash
Control Panel						
Internal USB	Y		J_USBKEY (connector)	1	User selectable	License key hard set ROM or user choice
Internal SD Module	Y		J_SDCARD (Connector)	1	User selectable - 1GB shipped	Secure Digital NAND Flash
Power Supply						
PSU Microcontroller	Y		Varies by part number	Up to 2	Maximum supported = 2MB per PSU	Embedded microcontroller flash
PERC 6/i Integrated						
PERC NVSRAM Config Data	Y		U23	1	32KB	Non-volatile SRAM
PERC Firmware	Y		U24	1	4MB	FLASH (NOR)
PERC Cache RAM		Y	U58-61	1	256MB	RAM
FRU	Y		U40	1	256MB	EEPROM
IBUTTON Key EEPROM	Y		U21	1	1KB	EEPROM
CPLD	Y		U_CPLD	1	72 macrocells	Internal Flash EEPROM
SAS 6/iR Integrated						
Controller Configuration Data	Y		U3	1	4MB	FLASH (NOR)
FRU	Y		U4	1	256KB	EEPROM

Component	Non-Volatile RAM	Volatile RAM	Reference Designator	Qty	Size	Type (e.g., Flash PROM, EEPROM)
Integrated Mirroring NVSRAM	Y		U1	1	32KB	Non-volatile SRAM
iDRAC6 Enterprise						
vFlash	Y		J_SD (connector)	1	1GB @ RTS, Larger later	Secure Digital NAND Flash

Component	Can user programs or operating system write data to it during normal operation?	Purpose (e.g., boot code)
Planar		
System BIOS SPI Flash	No	Boot Code, System Configuration Information, and EUFI environment.
LOM Configuration Data	No	LAN on motherboard configuration and firmware.
iDRAC6 Controller ROM	No	Not utilized.
iDRAC6 Controller RAM	No	iDRAC internal RAM.
System CPLD (EPROM)	No	System-specific hardware logic.
System CPLD (RAM)	No	Not utilized.
iDRAC6 Express Internal Flash	No for iDRAC Operating System; Yes for Managed System Services Repository.	iDRAC Operating System plus Managed System Services Repository (i.e., Unified Server Configurator, OS drivers, diagnostics, rollback versions of various programmables).
System RAM	Yes	System OS RAM.
TPM ID EEPROM (Plug in module only)	No	BIOS Identification of TPM module.
TPM Binding EEPROM (on China planar only)	No	BIOS binding of plug in module to a particular planar.
iDRAC6 SDRAM	No	BMC OS + VGA frame buffer.
iDRAC6 FRU	No	Motherboard electronic product identifier.
iDRAC6 Boot Block Flash	No	iDRAC boot loader and configuration (i.e., MAC address), life cycle log, and

Component	Can user programs or operating system write data to it during normal operation?	Purpose (e.g., boot code)
		system event log.
Trusted Platform Module	Yes	Storage of encryption keys.
Chipset		
CMOS	No	BIOS settings.
2.5" Backplane or 3.5" Backplane		
Storage Controller Processor	No	Backplane firmware (HDD status, etc.).
Control Panel		
Internal USB	Yes as allowed by OS.	Normal usage is read only software license key, but not limited.
Internal SD Module	Yes as allowed by OS.	Normal usage is embedded hypervisor OS. but not limited.
Power Supply		
PSU Microcontroller	No	Power supply operation, power telemetry data, and fault behaviors.
PERC 6/i Integrated		
PERC NVSRAM Config Data	No	Stores configuration data of HDDs.
PERC Firmware	No	Storage Controller Firmware.
PERC Cache RAM	No, not directly.	Storage RAID controller cache.
FRU	No	Card product identification for system inventory purposes.
IBUTTON Key EEPROM	No	Feature enablement encrypted key.
CPLD	No	HW control logic (i.e., power sequencing).
SAS 6/iR Integrated		
Controller Config Data	No	Stores configuration data of HDDs.
FRU	No	Card product identification for system inventory purposes.

Component	Can user programs or operating system write data to it during normal operation?	Purpose (e.g., boot code)
Integrated Mirroring NVSRAM	No	Stores configuration data of HDDs.
iDRAC6 Enterprise		
vFlash	Yes, when enabled, installed, and the media does not have the write protect switch applied.	Storage of logs, user images like files, drivers, OS's, etc.

Component	How is data input to this memory?
Planar	
System BIOS SPI Flash	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable containing the firmware file and the loader. System loaded with arbitrary data in firmware memory would not operate. Future firmware releases may add support for recovery of a bad/corrupted BIOS ROM image via the iDRAC (administrator privilege plus specific firmware, binary, and commands).
LOM Configuration Data	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable containing the firmware file and the loader. LOMs loaded with arbitrary data in firmware memory would not operate.
iDRAC6 Controller ROM	N/A
iDRAC6 Controller RAM	iDRAC embedded system.
System CPLD (EPROM)	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable (currently only DRMK utility support) containing the firmware file and the loader. System loaded with arbitrary data in CPLD memory would not operate.
System CPLD (RAM)	Not utilized
iDRAC6 Express Internal Flash	iDRAC OS: Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable containing the firmware file and the loader. System loaded without a good iDRAC firmware image yields a non-functional iDRAC. Managed Services Repository: Various partitions are loaded via vendor-provided firmware file and loader program just like iDRAC OS.
System RAM	System OS
TPM ID EEPROM (Plug in module only)	Factory load only.

Component	How is data input to this memory?
TPM Binding EEPROM (on China planar only)	BIOS only.
iDRAC6 SDRAM	Embedded iDRAC OS for 108MB and 8MB for VGA frame buffer.
iDRAC6 FRU	Factory and iDRAC embedded OS.
iDRAC6 Boot Block Flash	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable or out-of-band firmware updates across the management network. Bad contents yield the iDRAC inoperable and unrecoverable in the customer environment. Note the life cycle log is automatically updated by the iDRAC as various system component FW, HW, and SW versions are changed.
Trusted Platform Module	Using TPM-enabled operating systems.
Chipset	
CMOS	BIOS control only via input such as BIOS F2 menu user configuration settings (such as boot order).
2.5" Backplane or 3.5" Backplane	
Storage Controller Processor	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable (DRMK, USC, OS DUPs utility support) containing the firmware file and the loader. Backplane loaded with bad firmware will not provide backplane and HDD status.
Control Panel	
Internal USB	Either read-only license key or OS control copies.
Internal SD Module	Factory load, OS run time usage, and OS updates and configuration changes.
Power Supply	
PSU Microcontroller	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable (Unified Server Configurator) containing the firmware file and the loader. PSUs loaded with bad firmware will not provide PSU functional behavior and result in PSU system faults.
PERC 6/i Integrated	
PERC NVSRAM Config Data	Embedded storage firmware controls this data.
PERC Firmware	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable (DUPs, Unified Server Configurator) containing the firmware file and the loader.


Component	How is data input to this memory?
	Storage adapters loaded with bad firmware will not provide storage controller behavior.
PERC Cache RAM	Embedded storage firmware controls the use of storage cache data.
FRU	Factory only. Not customer updatable.
IBUTTON Key EEPROM	Factory only. Not customer updatable.
CPLD	Factory only. Not customer updatable.
SAS 6/iR Integrated	
Controller Configuration Data	Loading flash memory requires a vendor-provided firmware file and loader program that is executed by booting up the system from a floppy or OS-based executable (DUPs, Unified Server Configurator) containing the firmware file and the loader. Storage adapters loaded with bad firmware will not provide storage controller behavior.
FRU	Factory only. Not customer updatable.
Integrated Mirroring NVSRAM	Embedded storage firmware controls this data.
iDRAC6 Enterprise	
vFlash	Preloaded media before installation, or remote out-of-band upload of user data (i.e., ISO images, files) or local server read/write capability to use like a hard disk.

	How is this memory write protected?	How is the memory cleared?
Planar		
System BIOS SPI Flash	Software write protected.	Not possible with any utilities or applications and system is not functional if corrupted/removed.
LOM Configuration Data	Not explicitly protected but special applications are needed to communicate through the LOMs to reprogram this ROM.	Not user clearable.
iDRAC6 Controller ROM	Protected permanently by hardware.	Not clearable.
iDRAC6 Controller RAM	N/A	iDRAC reset.

	How is this memory write protected?	How is the memory cleared?
System CPLD (EPROM)	Requires special system-specific utility.	Not possible with any utilities or applications and system is not functional if corrupted/removed.
System CPLD (RAM)	It's not accessible.	Not clearable.
iDRAC6 Express Internal Flash	Writes are proxied through a temporary iDRAC scratchpad RAM and not directly made from an OS or OS application.	Not user clearable.
System RAM	OS control.	Reboot or power down system.
TPM ID EEPROM (Plug in module only)	HW read only	Not clearable, read only.
TPM Binding EEPROM (on China planar only)	Locked by BIOS from physical access by anyone after boot.	N/A—BIOS control only
iDRAC6 SDRAM	N/A	AC cycle for BMC OS and reset / power off server for VGA frame buffer.
iDRAC6 FRU	Writes controlled by iDRAC embedded OS.	EPPID is not clearable.
iDRAC6 Boot Block Flash	iDRAC embedded OS control of the write protection.	Not possible with any utilities or applications and iDRAC does not function as expected if corrupted/removed. Lifecycle log is clearable only in a factory environment. SEL is user clearable.
Trusted Platform Module	SW write protected.	F2 setup option.
Chipset		
CMOS	N/A—BIOS only control.	Planar NVRAM_CLR jumper or remove AC cord, remove cover, remove coin cell battery. Wait for 30 seconds, replace battery, cover, and then AC cord. F2 system setup option to restore defaults.
2.5" Backplane or 3.5" Backplane		
Storage Controller Processor	Embedded firmware only writeable through controlled iDRAC methods.	Not possible with any utilities or applications and backplane does not function as expected if corrupted/removed.

	How is this memory write protected?	How is the memory cleared?
Control Panel		
Internal USB	OS control.	OS control format.
Internal SD Module	Only by SD card write-protect switch.	OS control format.
Power Supply		
PSU Microcontroller	Protected by the embedded microcontroller. Special keys are used by special vendor-provided utilities to unlock the ROM with various CRC checks during load.	N/A—not in-system clearable.
PERC 6/i Integrated		
PERC NVSRAM Config Data	Storage controller firmware accessed only.	N/A—not in-system clearable.
PERC Firmware	Write control access by storage controller firmware.	N/A—not in-system clearable.
PERC Cache RAM	Storage controller firmware accessed only.	Storage controller firmware clearable only. Remove AC AND deplete or remove backup battery.
FRU	Protected in that no iDRAC-embedded firmware writes to this device. Although very convoluted, theoretically, IPMI I2C Master write commands would flow through to overwrite this EEPROM.	N/A—not in-system clearable.
IBUTTON Key EEPROM	SHA1 encryption included. Storage controller use only.	N/A—not in-system clearable.
CPLD	Only factory programmable.	N/A—not in-system clearable.
SAS 6/iR Integrated		
Controller Configuration Data	Write control access by storage controller firmware.	N/A—not in-system clearable.
FRU	Protected in that no iDRAC-embedded firmware writes to this device. Although very convoluted, theoretically, IPMI I2C Master write commands would flow through to overwrite this EEPROM.	N/A—not in-system clearable.

	How is this memory write protected?	How is the memory cleared?
Integrated Mirroring NVSRAM	Storage controller firmware accessed only.	N/A—not in-system clearable.
iDRAC6 Enterprise		
vFlash	Media write protection switch or OS control.	iDRAC-based format or local OS format or delete or card removal and formatted on a client.

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

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