Statement of Volatility – Dell PowerEdge R715

Dell PowerEdge R715 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 R715 server.

Server BIOS Memory (SPI Flash, IC)	Details
Size:	32 Mbit
Type [e.g. Flash PROM, EEPROM]:	Flash EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Boot Code and Configuration Information
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected

Server CMOS (Complementary Metal-Oxide Semiconductor) Memory	Details
Size:	512 Bytes
Type: [e.g. Flash PROM, EEPROM]:	Battery backed NVRAM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	RTC & Configuration settings
How is data input to this memory?	F2 Setup Menu during POST
How is this memory write protected?	N/A
Remarks	Jumper on motherboard can be used to clear to factory default settings. Removing CMOS battery will clear to factory defaults settings as well.

Server BMC (Baseboard Management Controller) also known as "iDRAC Express" boot block flash	Details
Size:	2 MB
Type: [e.g. Flash PROM, EEPROM]:	Serial Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	iDRAC boot loader and configuration (i.e. MAC address), Lifecycle log.
How is data input to this memory?	Data pre-programmed or update using Dell utility which is a DOS or Windows or Linux based executable containing firmware file and loader
How is this memory write protected?	Software write protected
Remarks	Bad contents yield the iDRAC inoperable and is unrecoverable in the customer environment. Note the lifecycle log is automatically updated by the iDRAC as various system component FW, HW and SW versions are changed.

Server BMC (Baseboard Management Controller) also known as "iDRAC Express" Internal Flash	Details
Size:	1 GB
Type: [e.g. Flash PROM, EEPROM]:	NAND Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	iDRAC Operating System plus Managed System Services Repository (i.e. Unified Server Configurator, OS drivers, diagnostics, rollback versions of various programmables)
How is data input to this memory?	iDRAC OS: Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected

Server System Event Log Memory / FRU	Details
Size:	4 KB
Type: [e.g. Flash PROM, EEPROM]:	SEEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Store System Events
How is data input to this memory?	BMC controller writes
How is this memory write protected?	Software write protected

FRU (Field Replacement Unit) memory. (x1 on the IO planar, x1 on the CPU planar)	Details
Size:	4Kb on IO planar, 2Kb on CPU planar
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	FRU information for boards such as board name, PPID, manufacturing date etc.
How is data input to this memory?	Data pre-programmed or using Dell utility at ICT/Functional Tester during board assembly
How is this memory write protected?	Software write protected

DIMM modules SPD (Serial Presence Detect) EEPROM (up to 16 depending on the number of DIMM modules present)	Details
Size:	256 Bytes
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	DIMM information and temperature settings.
How is data input to this memory?	Data preprogrammed by the DIMM vendors (lower 128 bytes). Also during boot sequence, data is written to SPD EEPROM (upper 128 Bytes).
How is this memory write protected?	Not write protected

Trusted Platform Module (TPM)	Details
Size:	128 Bytes
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Store firmware for TPM functionality
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program. System loaded with arbitrary data in firmware memory would not operate.
How is this memory write protected?	Software write protected
Remarks	F2 BIOS setup option to enable/activate/clear

TPM Alternative Plug-in module	Details
Size:	256 Bytes
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Stores encryption keys for TPM functionality
How is data input to this memory?	Data is pre-programmed by vendor. Keys are updated using TPM enabled operating systems.
How is this memory write protected?	Software write protected
Remarks	F2 BIOS setup option to enable/activate/clear

Server CPLD Devices (x1 on IO planar and x1 on CPU planar)	Details
Size:	2280 macro-cells and 1280 macro-cells
Type: [e.g. Flash PROM, EEPROM]:	Internal Flash EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	System power sequence control, error/config detection, and BIOS-BMC interaction.
How is data input to this memory?	Programming CPLD(s) requires a vendor provided logic file and loader program which is executed by booting up the system from a floppy or OS based executable containing the logic file and the loader.

	System loaded with arbitrary data in CPLD(s) would not operate.
How is this memory write protected?	Software write protected
Remarks	Need AC cycle after updating CPLD

Ethernet Controller Configuration Data (x2 on IO planar)	Details
Size:	8 Mb
Type: [e.g. Flash PROM, EEPROM]:	Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Controller Firmware & configuration data
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected
Remarks	There is a quantity of "2" SPI flash on the IO planar. Both flash parts are for the two 5709C controllers.

Power Supply Firmware and FRU memory	Details
Size:	LiteOn: 4K Flash, 256 Bytes RAM 32K Flash, 8KB RAM Emerson : 8K Flash, 384 Bytes RAM 16K Flash, 1KB RAM
Type: [e.g. Flash PROM, EEPROM]:	SEEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Stores PSU controller firmware. FRU information for boards such as name, manufacturing date etc.
How is data input to this memory?	FRU data pre-programmed by the PSU vendors. PSU firmware can be updated by Dell provided update package

How is this memory write protected?	Software write protected

Dell PERC H700i storage controller CPLD/Flash/NVSRAM etc. (if applicable)	Details
Size:	FRU: 256 Bytes Boot ROM: 8 KB Flash: 8 MB CPLD: 128 Macrocells NVSRAM: 128 KB iButton key EEPROM: 128 Bytes Battery Backed Cache: 512 MB
Type: [e.g. Flash PROM, EEPROM]:	FRU, EEPROM, Flash, CPLD, Non-volatile SRAM and a 1-wire EEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Flash stores the storage controllers firmware CPLD controls the power sequencing & battery backup logic NVSRAM stores the controller configuration FRU stores the PPID, manufacturing date etc. Battery Backed Cache: Store the data if the cache is not cleared and battery backup unit is enabled in the case of a power loss
How is data input to this memory?	FRU/CPLD data is preprogrammed at board build. NVSRAM is updated by the storage controller Flash is updated by Dell provided update package Cache stores the data before getting written to the disks, when WriteBack policy is enabled with battery backup
How is this memory write protected?	FRU is not write protected but everything else is software write protected
Remarks	PERC H700i controller is optional

Dell PERC H200i storage controller Flash/NVSRAM/FRU (if applicable)	Details
Size:	FRU: 256 Bytes Boot ROM: 8 KB Flash: 8 MB NVSRAM: 128 KB
Type: [e.g. Flash PROM, EEPROM]:	Flash (NOR), EEPROM and NVSRAM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Flash stores the storage controllers firmware NVSRAM stores the controller configuration FRU stores the PPID, manufacturing date etc.
How is data input to this memory?	FRU data is preprogrammed at board build. NVSRAM is updated by the storage controller Flash is updated by Dell provided update package
How is this memory write protected?	FRU is not write protected but everything else is software write protected
Remarks	PERC H200i controller is optional

PCIe Switch EEPROM (x1 on the IO planar)	Details
Size:	128 KB
Type: [e.g. Flash PROM, EEPROM]:	SEEPROM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Store PCIe Switch configuration information
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected

Backplane Firmware and FRU	Details
Size:	32 KB
Type: [e.g. Flash PROM, EEPROM]:	Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Backplane Firmware and FRU data storage
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected

Server BMC (Baseboard Management Controller) Firmware Flash Memory	Details
Size:	16 Mb Flash
Type: [e.g. Flash PROM, EEPROM]:	Flash PROM
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g. boot code]	Stores the BMC Firmware
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program which 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.
How is this memory write protected?	Software write protected

IDSDM MCU	Details
Size:	256 KBytes
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g. boot code]	Store firmware for IDSDM functionality
How is data input to this memory?	Loading flash memory requires a vendor provided firmware file and loader program. IDSDM module

	loaded with arbitrary data in firmware memory would not operate.
How is this memory write protected?	Software write protected
Remarks	IDSDM is an option

IDSDM Write Journal Flash	Details
Size:	8 MBytes
Type: [e.g. Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g. boot code]	Store write journal for shutdown recovery
How is data input to this memory?	IDSDM Microcontroller writes to and reads from this memory via SPI interface during operation
How is this memory write protected?	N/A

SD card(s) (if present) for IDSDM (one or two SD cards depending on the redundancy mode ordered with it)	Details
Size:	Multiple
Type: [e.g. Flash PROM, EEPROM]:	Secure Digital NAND Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g. boot code]	Normal usage is embedded Hypervisor OS but not limited
How is data input to this memory?	Factory load, OS run time usage and OS updates and configuration changes.
How is this memory write protected?	Media write protection or Software write protected
Remarks	IDSDM is an option

VFlash for iDRAC Enterprise	Details
Size:	Multiple
Type: [e.g. Flash PROM, EEPROM]:	Secure Digital NAND Flash
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes

Purpose? [e.g. boot code]	Storage of logs, user images like files, drivers, OS's etc.
How is data input to this memory?	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 it like a hard disk
How is this memory write protected?	Media write protection or Software write protected
Remarks	iDRAC Enterprise and VFlash is optional

NOTE: There are six external and one internal USB ports on R715, where a user can install a USB flash memory.

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

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