DELLTechnologies

Statement of Volatility – Dell PowerEdge R760

Dell PowerEdge R760 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 R760 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?
Planar										
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	U121	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.

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?
							environment, ME			
BIOS Data SPI Flash	Non-Volatile	1	U19	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	U29	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.
BMC EMMC	Non-Volatile	1	U122	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

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?
							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	U_CPLD1	432 kb	RAM	No	Not utilized	Not utilized	Not accessible	Not accessible
System CPLD Flash	Non-Volatile	1	U_CPLD1	448 kb	FLASH	No	Power on System Firmware	Firmware update	BIOS Security Protocols	Not user clearable
System Memory: RDIMM	Volatile	Up to 32	CPU1: A1~A16 CPU2: B1~B16	Up to 256GB per DIMM	RAM	Yes	System OS RAM	System OS	OS Control	Reboot or power down system
CPU VCCIN and FIVRA Regulators	Non-Volatile	2	U50, U69	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.

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?
CPU INFAON and VCCFA Regulators	Non-Volatile	2	U105, U106	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.

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?
12x3.5" SAS3/SATA Backplane										
SEP internal flash	Non-Volatile	1	U16	Flash: 512KB Data SRAM : 256KB	Integrated Flash + Data SRAM + Battery Powered	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	Storage SRAM					
8 x 2.5" Universal SAS3/SATA/NVMe Front Backplane										
SEP internal flash	Non-Volatile	1	U14	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
8 x 2.5" Universal SAS4/SATA/NVMe Front Backplane										
SEP internal flash	Non-Volatile	1	U14	Flash: 512KB	Integrated Flash +	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?
				Data SRAM : 256KB Battery Powered Storage SRAM : 64B	Data SRAM + Battery Powered Storage SRAM					
24x2.5" NVMe passive Backplane										
SEP internal flash	Non-Volatile	2	U14,U15	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
24x 2.5" SAS/SATA with 8 Universal Backplane										

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?
SEP internal flash	Non-Volatile	1	U14 U15	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
EXP Flash	Non-Volatile	1	U_FLASH1	128KB	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.
NVSRAM	Non-volatile	1	U_NVSRAM	128KB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	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?
FRU	Non-volatile	1	U3	256KB	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	no write protected	User cannot clear the memory.
8x2.5" SAS4/SATA Smart Flow Backplane										
SEP internal flash	Non-Volatile Non-Volatile	1	U46	4Mbit in-chip SPI Serial Flash	Flash	No	Firmware + FRU	I2C interface via iDRAC	Program write protect bit	The user cannot clear memory.
Backplane External FRU				256 Bytes		No	FRU	Programmed at ICT during production	No write protected	
4x2.5" Rear Universal SAS4/SATA/PCIe Backplane										
SEP internal flash	Non-Volatile	1	U47	Flash: 512KB Data SRAM : 256KB Battery Powered Storage	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?
				SRAM : 64B						
2x2.5" Rear Universal SAS4/SATA/PCIe Backplane										
SEP internal flash	Non-Volatile	1	U47	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

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?
H965i Front PERC (Internal Controller)										
SPI Flash	Non-Volatile	1	U2	256Mb	SPI Flash	No	Card firmware	Pre-programmed before assembly. Can be updated using Dell/Broadcom tools	Not write protected. Not visible to Host Processor	User cannot clear the memory.
FRU	Non-volatile	1	U1019	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.
CPLD	Non-volatile	1	U1088	64kb	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	Flash	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

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?
NVSRAM	Non-volatile	1	U1087	128kB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	Not write protected Not visible to host CPU	User cannot clear this memory
BMU	Non-Volatile	1	U1126	180KB	Integrated Flash + EEPROM	No	Battery Management control	ROC may program data during FW and during boot	Not write protected	User cannot clear this memory
SPD	Non-volatile	1	U22	256b	EEPROM	No	Memory configuration data	Pre-programmed before assembly	No write protected. Not visible to Host Processor	User cannot clear the memory.
NAND Flash	Non-volatile	1	U1100	512Gb	ONFI Flash	No	Cache offload during unexpected power loss	Programmed by ROC during cache offload	No write protected. Not visible to Host Processor	User cannot clear the memory.
SDRAM	Volatile	9	U1077~U1086	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
H965i PERC Adapter										
SPI Flash	Non-Volatile	1	U2	256Mb	SPI Flash	No	Card firmware	Pre-programmed before	Not write protected. Not	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	visible to Host Processor	
FRU	Non-volatile	1	U1019	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	Not write protected	User cannot clear the memory.
CPLD	Non-volatile	1	U1088	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
BMU	Non-Volatile	1	U1126	180KB	Integrated Flash + EEPROM	No	Battery Management control	ROC may program data during FW and during boot	Not write protected	User cannot clear this memory
NVSRAM	Non-volatile	1	U1087	128kB	NVSRAM	No	Configuration data	ROC writes configuration data to NVSRAM	Not write protected Not visible to host CPU	User cannot clear this memory
SPD	Non-volatile	1	U22	256b	EEPROM	No	Memory configuration data	Pre-programmed before assembly	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?
NAND Flash	Non-volatile	1	U1100	512Gb	ONFI Flash	No	Cache offload during unexpected power loss	Programmed by ROC during cache offload	No write protected. Not visible to Host Processor	User cannot clear the memory.
SDRAM	Volatile	9	U1077~U1086	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
HBA355i Front (Internal Controller)										
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

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?
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
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?
H755 Front PERC (Internal Controller)										
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.

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?
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 |
| 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 |
| **H755 PERC Adapter** | | | | | | | | | | |
| 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 |

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?
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.

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?
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.
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
H755N Front PERC (Internal Controller)										
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.
FRU	Non-volatile	1	U1019	2Kb	EEPROM	No	Card manufacturing information	Programmed at ICT during production.	No 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?
SPD	Non-volatile	1	U1019	2Kb	EEPROM	No	Memory configuration data	Pre-programmed before assembly	No write protected. Not visible to Host Processor	User cannot clear the memory.
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.
CPLD	Non-volatile	1	U1088	64kb	Flash	No	Power sequencing and Cache Offload	NA	NA	NA
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.
SDRAM	Volatile	9	U1077~U1085	8GB	SDRAM	No	Cache for HDD I/O	ROC writes to this memory -	No write protected. Not	Cache can be cleared by powering off the card

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?
								using it as cache for data IO to HDDs	visible to Host Processor	
MCU	Non-volatile	1	U41	8KB	EEPROM	No	PCIe Bifurcation information to system iDRAC	NA	NA	NA
BMU	Non-Volatile	1	U1126	180KB	NA	No	Battery Management control	NA	NA	NA
HBA355i Adapter										
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 |

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?
H355 Front PERC (Internal Controller)										
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\n\nNot 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\n\nNot visible to host CPU	User cannot clear this 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?
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
H355 Adapter										
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
NVSRAM	Non-volatile	1	U3	128kB	NVSRAM	No	Configuration data	ROC writes configuration	Not write protected	User cannot clear this 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?
								data to NVSRAM	Not visible to host CPU	

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?
Status LED Control Panel										
Microcontroller	Non-Volatile	1	U_TINY	8KB	Flash	No	Driving Health and Status LED	I2C via iDRAC	Hardware strapping	User cannot clear the memory.
Standard/LC RIO										
MCU	Non-Volatile	1	U6	8kB	Flash ROM	No	Standard/LC RIO information	The data is flash via iDRAC auto update	No write protected. Not visible to Host Processor	User cannot clear the memory.
TPM										
Trusted Platform	Non-Volatile	1	U2	128 Bytes	EEPROM	Yes	Storage of encryption keys	Using TPM Enabled	SW write protected	F2 Setup option

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?
Module (TPM)								operating systems		
Power Button Control Panel										
SPI Flash	Non-Volatile	1	U2	32 Mb	SPI Flash	No	EasyRestore functionality contains Service Tag, Copy of SEL logs	SPI interface from iDRAC to Right Cntl Panel	Embedded iDRAC subsystem firmware actively controls sub area based write protection as needed.	The user cannot clear memory.
LOM										
SPI Flash	Non-Volatile	1	U1	8-Mbit DataFlash (with Extra 256-Kbits)	SPI Flash EEPROM	Yes	Firmware, configuration data	Firmware and some configuration data flashed via Dell Update Package (DUP); some configuration data is programmed during manufacturing; end user	Reserving write protection function for HW design.	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?
								configuration data is written via UEFI HII		
MCU	Non-Volatile	1	U2	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
BOSS-N1										
RAID controller external SPI FLASH	Non-Volatile	1	U17	8Mb	FLASH EEPROM	No	Boot code, FW	By programming the image via firmware update process	N/A	Use Flash tool, type "go.nsh w y"
CPLD	Non-Volatile	1	U1120	256Kb						
MCU	Non-volatile	1	U1113	8KB						
FRU	Non-Volatile	1	U_BOSS_EEPROM	2Kb	FLASH EEPROM	No	Card manufacturing information	During Manufacturing, by programming the image via	N/A	By writing to Flash

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?
								firmware update process. During runtime, by I2C Proprietary Command Protocol		
PUCK_50A										
MCU	Non-volatile	1	U1	16kB	Flash ROM	No	PUCK information	The data is flash via iDRAC auto update	No write protected. Not visible to Host Processor	User cannot clear the memory.
Quick Sync 2										
MCU	Non-volatile	1	USAM7	2048kB	Flash ROM	No	Driving Health/ Status LED and Wifi-BT communication.	SPI interface via iDRAC	Hardware strapping	User cannot clear the memory.
R1B/R2A/R3A/R3B/R4B/R1 Paddle/R4 Paddle/ R1P/R1Q/R4P/R4Q										
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.

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?
R1R										
MCU	Non-volatile	2	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.
R4R										
MCU	Non-volatile	3	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.

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?
PSU										
DELTA PSU (700W,1100W, 1400W, 1800W, 2400W, 2800W)										
Primary MCU	Non-volatile	1	IC703	64KB	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	Non-volatile	1	IC805	64KB	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.
FRU	Non-volatile	1	IC704	16KB	EEPROM	No	PSU information	During Manufacturing , by programming the image via firmware update process	SW write protected	User cannot clear the memory.
ARTESYN PSU (800W, 1100W, 1400W, 2400W)										
Primary MCU	Non-volatile	1	U317 (TI)	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.

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?
Secondary MCU	Non-volatile	2	U301 (TI) U315 (ST)	32K 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.
FRU	Non-volatile	1	U305	2Mb	SERIAL FLASH	No	PSU information	During Manufacturing	SW write protected	User cannot clear the memory.
LiteOn PSU (700W, 800W, 1100W, 1400W, 1800W, 2800W)										
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.

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

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