Statement of Volatility – Dell EMC PowerEdge T40

The Statement of Volatility provides you the information related to volatile and non-volatile components of different configurations of Dell EMC PowerEdge servers.

Volatile components lose their data when power cord is removed from the system, whereas, nonvolatile components continue to retain their data when the power has been removed from the component.

The following Non-volatile components are present in the PowerEdge T40:

BIOS Configuration:
The BIOS information is stored in one flash IC (32MB, identified as F3U1). This device is identified as BIOS SOCKET on the motherboard. This device contains 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. They do store System password, Setup Password and TPM security settings if those features are enabled by the user.

PCH CMOS:
The PCH identified as PCH-H on the motherboard contains a 256 bytes battery-backed memory. This memory contains configuration data required by the BIOS to boot the system. It does not store passwords or other user level data. The contents of this memory are lost after several minutes, if the coin-cell battery is removed from the motherboard.

SIO:
The SIO identified as U104 on the motherboard contains a non-volatile memory that contains data for running the fan control and pre-POST diagnostics. It does not store password or other user level data.

TPM 2.0 (Trusted Platform Module) Security Device:
The TPM is identified as U22. It 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 non-volatile memory.

CCG4 USB Type-C Port Controller
The CCG4 is the USB Type-C port controller and is identified as TCU1A on the motherboard. It contains FW that controls USB Type-C behavior and power delivery. No information pertaining to user applications or data is stored in the CCG4 device.

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, including time of day information.

There are other volatile and non-volatile components on the devices or peripherals attached to the motherboard as follows:
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.

Hard Drives: These store non-volatile data. All data is processed through cache (volatile) memory. Any associate internal NVRAM is factory programmed. It does not contain any user data and is not accessible by the user.

Monitor: May retain “burned 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 and are not accessible by the user.

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, 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 (CFPU 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.

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 must be valid. Dell system will be able to go to S4 if the OS and the peripherals support S4 sate.

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 following table shows all the states supported by the PowerEdge T40

Model Number	S0	S1	S3	S4	S5
Dell PowerEdge T40	X				X

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