PQA600 Picture Quality Analyzer Declassification and Security

Instructions

Tektronix

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Preface

The PQA600 Picture Quality Analyzer is based on the Dell T7500 Precision Workstation. Refer to the following *Dell Statement of Volatility — Dell Precision Workstation T7500* for information about data security concerning the PQA600.

April 22, 2009

Subject: Statement of Volatility – Dell Precision Workstation T7500

Gentlemen:

The Dell Precision Workstation T7500 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.

The following memory components are present on the T7500 motherboard:

BIOS Configuration
The BIOS information is stored in a 16 Mbit flash IC. This device is identified as U_BIOS on the motherboard. U_BIOS contains the 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 the U_BIOS device, however, the BIOS device does store administrator and/or hard drive encryption passwords if those features are enabled by the user.

Embedded Controller
The Embedded Controller contains 192 kByte of non-volatile storage space and is identified as U_EC on the motherboard. The EC contains the software necessary to manage low-level control functions on the motherboard such as thermal control. No information pertaining to user applications or data is stored in the U_EC device.

The embedded controller also contains 16 kBytes of volatile memory space. The contents of this memory space are lost when power is removed from the system.

Fan Controller
The Fan Controller (U_HWM) is a factory-programmed device that monitors and controls the various fans needed for proper thermal operation. This device contains 32k bytes of ROM. The data inside the ROM is not accessible to the user. No information pertaining to user applications or data is stored on the Fan Controller.

CPLD
The CPLD IC is a factory-programmed Logic Device that incorporates various low-level hardware logic functions into a single device. It is in location U_CPLD on the motherboard. No information pertaining to user applications or data is stored on the CPLD. The CPLD contains 8 kBytes of flash memory; however, this memory is left blank and is not used by Dell. The CPLD can be reprogrammed via the use of a special software program provided by Dell. The special program is not capable of updating the 8 kByte flash memory.

ICH CMOS
The ICH, identified as U_ICH, contains a 256 Byte battery-backed memory. This memory contains custom configuration data required by the BIOS to boot the system. It does not store passwords or other user level data.

Ethernet Controller EEPROM
The Ethernet Controller EEPROM is identified as U_LOMEE on the motherboard. It is an 8 Mbit device. The Ethernet Controller EEPROM stores driver information and the system MAC address. It does not store password, IP address, domain name, system ID, or similar information.

SAS Controller Memory
The SAS (Serial-attached SCSI) EEPROM is located at U_SAS_FLASH on the motherboard. It is an 8 Mbit device and stores configuration information related to the on-board SAS controller. No information pertaining to user applications or data is stored on the SAS EEPROM.

The SAS SRAM memory device is identified as U_SAS_MEM on the motherboard. It provides a temporary "scratch-pad" memory pool for the SAS controller. This device is volatile; all data is lost when power is removed from the system.

TPM 1.2 (Trusted Platform Module) Security Device
This device (identified as U_TPM) 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 NVM.

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 (DDR3 DIMMs) and the on-board graphics and storage interface devices. **However**, the user should note that under some circumstances (for example, cold temperatures) the DDR3 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 battery) will destroy system data on the SIO (super IO), ICH (I/O controller hub), and the time of the day information.

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

The <u>Dell PERC6</u> RAID storage card uses a battery to maintain a non-volatile cache that protects data in the event of a power failure. This cache may contain user application information or data.

The <u>Video Card</u> 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.

The <u>CD-RW/Diskette Drives/DVD-R/W</u> are input/output devices, whereas the <u>DVD/CD-ROM</u> is an input device only. All data is processed through cache (volatile) memory. Any associated internal NVRAM is factory programmed, does not contain any user data, and is not accessible by the user.

The <u>SAS and/or SATA Hard Drives and optional storage controller cards</u> store non-volatile data. All data is processed through cache (volatile) memory. Any associated internal NVRAM is factory programmed, does not contain any user data, and is not accessible by the user. These devices may be removed.

The <u>Monitor</u> may retain "Burn-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 & 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 and 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 (CPU 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. Dell systems will be able to go to S3 if the OS and the peripherals used in the system supports S3 state. Win98 SE, Win 2K, Win XP and Windows Vista support S3 state.
- 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 has to be valid. Dell systems will be able to go to S4 if the OS and the peripherals support S4 state. Win 2K, Win XP and Windows Vista support S4 state.
- 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 Precision workstation T7500 supports all of the above states.

Please direct any questions to the undersigned

Very truly yours;
Dell Marketing L.P.