Statement of Volatility for GigaStor Products

The GigaStor products contain both non-volatile and volatile components. Non-volatile components continue to retain their data even after power has been removed from the component. Volatile components lose their data immediately upon removal of power from the component. Whether a given volatile component is powered at any moment in time is dependent on the power state of the GigaStor product and on which supply-voltage that component derives power from.

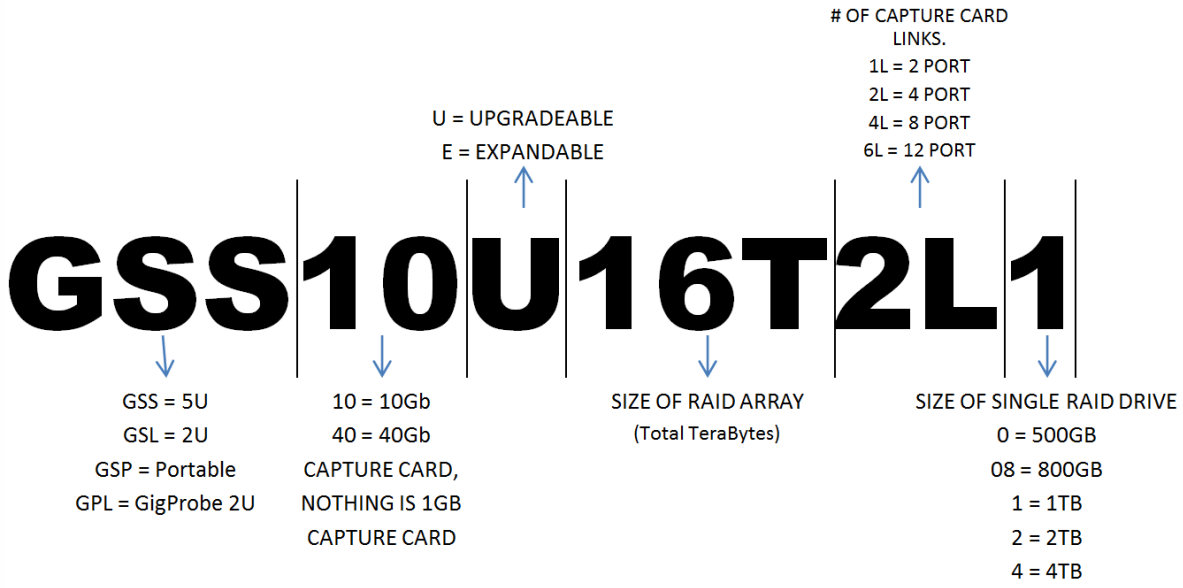
Industry Acronyms

The following list provides industry acronyms that are used in this document:

AC	Alternating Current
BIOS	Basic Input / Output System
BMC	Board Management Controller
CPLD	Complex Programmable Logic Device
DIMM	Dual In-line Memory Module
DMI	Desktop Management Interface
EEPROM	Electrically Erasable Programmable Read-Only Memory
Flash	Flash Memory
Gb	Gigabit
GbE	Gigabit Ethernet
GB	Gigabyte
HDD	Hard Disk Drive
HW	Hardware
IPMI	Intelligent Platform Management Interface
LoV	Letter of Volatility
MB	Megabyte
NOR Flash	A non-volatile flash memory device with NOR logic-gate memory cell arrangement.
NVRAM	Non Volatile Random Access Memory
PCH	Platform Controller Hub
PCIe	Peripheral Component Interconnect Express
PHY	Physical Layer
RTC	Real Time Clock
SDRAM	Synchronous Dynamic Random Access Memory
SoV	Statement of Volatility
SSD	Solid-state Disk Drive
TB	Terabyte
VGA	Video Graphics Array
VRM	Voltage Regulation Module
USB	Universal Serial Bus

Product Nomenclature

The following figure depicts the GigaStor product nomenclature:



How many drives in unit?

16T divided by 0T (500GB) = 32 drives
16T divided by 1T = 16 drives
16T divided by 2T = 8 drives
16T divided by 4T = 4 drives

Volatile Components

The GigaStor products contain volatile components socketed and soldered onto the Motherboard and the installed PCIe cards. Volatile components are also present on the HDDs and SSDs. All disk data is processed through volatile cache memory contained on the disk drive circuit board. The data contained within the volatile components will be cleared when power is removed from the component. The GigaStor power state determines whether a given volatile component will be powered at any moment in time and subsequently whether the volatile component may contain data.

The GigaStor products contain the following volatile components:

Volatile Component	GSP	GSLU	GSS	User Data	Removable	Procedure to Clear
Enclosure: HDD & SSD Cache Memory	X	X	X	Yes	No	Power off product for 5 seconds.
Motherboard: DIMM System Memory[1]	X	X	X	Yes	Yes	Power off product for 5 seconds.
Motherboard: On-board VGA Memory[1]	X	X	X	Yes	No	Power off product for 5 seconds.
Motherboard: On-board BMC SDRAM[1]	X	X	X	No	No	Power off product and remove AC for 5 seconds.
Motherboard: On-board PCH	X	X	X	No	No	Power off product, remove AC, and remove coin-cell for 5 minutes.
Motherboard: On-board HW Monitor & RTC[1]	X	X	X	No	No	Power off product, remove AC, and remove coin-cell for 5 minutes.
RAID Controller Card: DIMM System Memory[2]	X	X	X	Yes	Yes	Power off product for 5 seconds.
RAID Controller Card: On-board SDRAM System Memory[2]	X	X	X	Yes	No	Power off product for 5 seconds.
Capture Card (1Gb/10Gb/40Gb): On-board SDRAM Buffer Memory	X	X	X	Yes	No	Power off product for 5 seconds.
Graphics Card: On-board SDRAM Buffer Memory	X			Yes	No	Power off product for 5 seconds.
Dual Redundant Power Supply: On-board HW Monitor	X	X	X	No	No	Power off product, remove AC for 5 seconds.

1. See the appended example SuperMicro SoV document for further detail. The particular Motherboard installed in your product varies depending on when the unit was sold, the appended SoV is a relevant example for that board. Contact www.supermicro.com for the appropriate SoV for the Motherboard installed in your particular product.
2. See the appended example Areca Letter of Volatility document for further detail. The particular RAID Card installed in your product varies depending on when the unit was sold, the appended LoV is a relevant example for that board(s). Contact www.areca.com.tw for the appropriate SoV for the RAID Card installed in your particular product.

Non-Volatile Components

The GigaStor products contain non-volatile components soldered onto the Motherboard and installed PCIe cards. The procedure to clear these non-volatile components require, use of a specific programmer device to erase. The products also contain one or more HDDs with zero or more SSDs that store non-volatile system boot image and user data. The procedure to clear the HDD and SSD components require either removal or use of an appropriate software application to securely erase the disk drives themselves. Any NVRAM contained on the disk drive circuit board is factory programmed by the disk drive manufacturer, does not contain any user data, and is not accessible by the user. Finally the dual redundant power supply contained within the GigaStor enclosure does not contain non-volatile memory of any kind.

The GigaStor products contain the following non-volatile components:

Non-Volatile Component	GSP	GSLU	GSSU	GSSE	GSS10U	GSS10E	GSS40E	APEX	User Data	Removable	Comments
Enclosure: Recovery USB Flash Drive	X	X	X	X	X	X	X	X	Yes	Yes	Contains copy of the system image.
Enclosure: HDDs and SSDs	X	X	X	X	X	X	X	X	Yes	Yes	Contains system image and user application data.
Motherboard: LAN EEPROM[1]	X	X	X	X	X	X	X	X	No	No	Contains LAN configuration data.
Motherboard: BIOS EEPROM[1]	X	X	X	X	X	X	X	X	No	No	Contains BIOS and DMI data.
Motherboard: IPMI Firmware[1]	X	X	X	X	X	X	X	X	No	No	Contains IPMI configuration data.
Motherboard: BMC NOR Flash[1]	X	X	X	X	X	X	X	X	No	No	Contains BMC boot code.
Motherboard: VRM Controller[1]	X	X	X	X	X	X	X	X	No	No	Embedded voltage regulation controller configuration data.
Motherboard: CPLD[1]	X	X	X	X	X	X	X	X	No	No	Contains CPLD configuration and operation image.
RAID Controller Card: NOR Flash[2]	X	X	X	X	X	X	X	X	No	No	Contains upload firmware and controller configuration settings.
RAID Controller Card: NVRAM[2]	X	X	X	X	X	X	X	X	No	No	Stores operational parameters.
Capture Card (10Gb/10Gb/40Gb): Configuration NOR Flash	X	X	X	X	X	X	X		No	No	FPGA configuration image.
Graphics Card: Boot NOR Flash	X								No	No	Contains board initialization and boot code.

1. See the appended example SuperMicro SoV document for further detail. The particular Motherboard installed in your product varies depending on when the unit was sold, the appended SoV is a relevant example for that board. Contact www.supermicro.com for the appropriate SoV for the Motherboard installed in your particular product.
2. See the appended example Areca Letter of Volatility document for further detail. The particular RAID Card installed in your product varies depending on when the unit was sold, the appended LoV is a relevant example for that board(s). Contact www.areca.com.tw for the appropriate SoV for the RAID Card installed in your particular product.

This table lists the non-volatile disk drive configurations for each GigaStor product model:

Model(s)	Drive Sizes
GSP	5x 1TB HDD, or 10x 1TB HDD, or 1x 1TB HDD + 8x SSD
GSLU	1x 1TB HDD + 4x 2TB HDD, or 8x 2TB HDD
GSSU, GSS10U	1x 1TB HDD + 8x 2TB HDD, or 16x 2TB HDD, or 24x 2TB HDD
GSSE, GSS10E, GSS40E	1x 1TB HDD + 24 or more 2TB or 4TB HDDs
APEX	1x 1TB HDD + 8x 2TB HDD

Viavi Solutions, Inc. reserves the right to change the specific amounts of memory and disk size configurations for its different models.

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STATEMENT OF VOLATILITY (SOV)

CUSTOMER		ISSUE DATE	4/16/2013

PRODUCTS COVERED IN THIS DOCUMENT

SMC PRODUCT NUMBER		CUSTOMER PRODUCT NUMBER	

THE FOLLOWING INFORMATION COVERS THE SOV INFORMATION FOR PARTS OF THE ABOVE PRODUCT .

PLEASE REFFERNCE THE APPROPRIATE PART NUMBER SECTIONS AS NEEDED.

PART	SMC PART NUMBER	X9DR3/I-F Motherboard	RESPONSIBLE ENGINEER	VICTOR WU
	CUSTOMER PART NUMBER		SIGNATURE	

TOPICS	Device	Reference	Volatility	User Data	Procedure to Clear
	PCH	U3	Non-Volatile	No	Remove AC and Battery for 5 Minutes
	LAN EEPROM	UL2	Non-Volatile	No	Use programmer to erase
	BIOS Chip	U34	Non-Volatile	No	Use programmer to erase
	VGA Memeory	UG1	Volatile	Yes	Power off for 2 seconds
	HW Monitor	U27	Non-Volatile	No	Remove AC and Battery for 5 Minutes
	IPMI FIRMWARE	UM6	Non-Volatile	NO	Use programmer to erase
	VRM CONTORLER	U47,U53,U62,U70,UF4,UF11	Non-Volatile	NO	Use programmer to erase.
	CPLD	U35	Non-Volatile	NO	Use programmer to erase.

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Letter of Volatility

The chart below shows the corresponding memory types for Areca RAID Controllers. Please note, there are no remnants of customer data retained in the controller when (i) HDD is removed, (ii) the power is turned off and (iii) the Battery module is removed.*1

Model	Memory size	Memory type	Volatility	User Data
ARC-1883I ARC-1883X ARC-1883LP	128MB	NORFLASH	Non-Volatile	No
	128KB	NVRAM	Non-Volatile	No
	2GB	DRAM	Volatile	Yes
ARC-1883IX-12/16/24	128MB	NORFLASH	Non-Volatile	No
	128KB	NVRAM	Non-Volatile	No
	2GB*2	DRAM	Volatile	Yes

Note :

NORFLASH is used for firmware code upload and store controller configuration settings, contains no user data. NVRAM is used to store operational parameters and contains no user data.

*1 Battery module is optional

*2 Default DRAM size is 2GB, upgradeable.