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# **S2A9900-docs Documentation**

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**Enproduktion GmbH**

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S2A9900 documentation, based on the HELP output of the S2A9900 terminal commands.



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## Connect to S2A9900

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1. Connect yourself to the RJ45 telnet plug (right above the RJ45 LINK connector)
2. *telnet* <IP>
3. default user: admin
4. default password: password





## 2.1 Recover failed state in a dual mode

if DUAL shows failed for the first node, do:

```
DUAL SINGLET  
DUAL HEAL
```

if DUAL shows failed for the second node, do:

```
DUAL HEAL
```

## 2.2 Graceful shutdown

1. Connect to device 2
2. SHUTDOWN
3. Connect to device 1
4. SHUTDOWN



## 3.1 ALARM

ALARM Functions pertaining to the AVR System Alarm.

This command controls the audible AVR system alarm.

**DISABLE** Disable the AVR system alarm. This command disables the AVR System Alarm for any alarms that are currently sounding and all future alarms. This command only disables the alarm for the current power cycle.

**ENABLE** Enables the AVR system alarm. This command enables the AVR System Alarm for any alarms that are in progress and all future alarms. By default alarms are always enabled unless they are disabled via the ALARM DISABLE command or the hardware alarm button.

**STATUS** Displays whether the AVR system alarm is enabled or disabled. NOTE: Even though the system alarm can be enabled or disabled by both hardware and software methods, the status does not identify the method used. Additionally, neither method takes precedence over the other. Therefore, a hardware command to disable the alarm can override a software command to enable it and vice versa.

**TEST** Tests the AVR system alarm.

## 3.2 APC\_UPS

APC\_UPS Displays the status of the APC UPS trap monitor.

This command is used to display the status of the APC UPS SNMP trap monitor. The monitor may also be enabled or disabled by this command. Any outstanding APC UPS traps may be also cleared through this command. Note: The SNMP community string on the UPS should be set to S2A.

**CLEAR\_FAULTS** This parameter deletes all pending APC UPS faults from the fault list. All APC UPS events that disabled writeback caching will be cleared.

**MONITOR=ON/OFF** This parameter enables and disables the APC UPS monitor. Default is OFF.

## 3.3 API

API Display/Change the enabling/disabling of API connections.

Allows the user to display/change whether API connections are currently (temporarily) ENABLED or DISABLED. Note that this command only provides control over API connections during the current power cycle. To 'permanently' disable or enable API connections (i.e. across power-cycles), the user is referred to the NETWORK [[API\_SERVER=ON|OFF] command. Note that the default setting for this command at power-on is ENABLED.

**CLEARSTATS** Resets the collected statistics on API connections.

**DISABLE** Allows the user to (temporarily) disable the establishment of connections to the API Server. Users at remote locations will be unable to establish a new API connection until an API ENABLE command is issued.

**ENABLE** Allows the user to (re-)enable the establishment of connections to the API Server.

**RESTART** Allows the user to do a full restart on the API server.

**SHUTDOWN** Allows the user to totally shutdown the API server. This command should not be used under normal circumstances, use API DISABLE to just turn off API accesses. Note: This command will only shutdown the API server during the current power cycle, refer to NETWORK API\_SERVER in order to make command permanent.

**START** Allows the user to start the API server the was shutdown using the API SHUTDOWN command. This command should not be used under normal circumstances. For most circumstances API ENABLE and API DISABLE are appropriate. Note: NETWORK API\_SERVER must be set to ON for this command to work.

**STATS** Displays the collected statistics on API connections.

## 3.4 AV

AV Displays information about the Audio/Visual settings.

This command is used to change the Audio/Visual configuration settings for the system. These parameters are used to tune the system and the disks for better performance and a lower latency. The writeback and prefetch settings for each LUN are changed with the **CACHE** command.

**FAILCC=ON|OFF** This parameter will tell the host ports to report a check condition for all SCSI commands when the unit is in a failed state. This command should only be used in AV environments when a check condition is required instead of taking the unit off the loop. Default is OFF.

**FASTAV=ON|OFF** This parameter enables and disables the disk fast Audio/Video read option for streaming data. If the FASTAV parameter is ON, the system will start the data transfer for read operations before all of the disk commands have finished. This feature reduces the latency for read operations but the system will be unable to check the integrity of the data. The FASTAVTIMEOUT parameter indicates how long the host command must wait before the FASTAV mechanism will activate. Note: This parameter is saved on a per-LUN basis. Use in combination with the LUN=x parameter to change the settings for a single LUN. Default is OFF.

**FASTAVTIMEOUT=x** This parameter sets the timeout before the FASTAV option will activate on a host read command. The FASTAV mechanism will not be used until the host command takes longer than the timeout value. A value of zero indicates that the system will start the data transfer as soon as a minimum number of drives are ready. This value is in 100 millisecond increments. The range for 'x' is 0 to 600. The default is 200.

**LUN=x** This parameter may be used in combination with the FAST\_AV and RC parameters, in order to specify which LUN is to be changed. By default, if no LUN is specified with this parameter, then all the LUNs in the system will be updated. Valid LUNs are 0 to 127. Default is all LUNs.

**ORDEREDQUEUE=x** Enables the use of ordered tags when communicating with the drives. The value 'x', indicates the number of disk commands that can be sent before an ordered tag must be sent to the disks: 0 indicates no ordered tags, 1 indicates every command has an ordered tag, 2 indicates every second command has an ordered tag, 3 indicates every third command has an ordered tag, 4 indicates every fourth command has an ordered tag, etc... Valid range is 0 to 255. Default is 0.

**RC=ON/OFF** This parameter enables and disables the Read Continuous option for Audio/Video streaming data. If the RC parameter is ON, the system will start the data transfer for read operations after RCTIMEOUT is reached even if the disks commands have not finished. This feature is used to reduce the latency for read operations in Audio/Visual environments where latency is more important than data integrity. **WARNING:** This feature allows the system to return invalid data to the initiator. Note: This parameter is saved on a per-LUN basis. Use in combination with the LUN=x parameter to change the settings for a single LUN. Enabling this feature will automatically enable FASTAV. Default is OFF.

**RCTIMEOUT=x** This parameter sets the host command timeout for the Read Continuous option for Audio/Video streaming data. A timeout value of zero will disable the Read Continuous feature in the system. This value is in 100 millisecond increments. The range for 'x' is 0 to 255. The default is 250.

**UA=ON/OFF** This parameter enables and disables the initial Unit Attention condition when an initiator logs into the system. If the UA parameter is ON, the system will report a Unit Attention condition on the first SCSI command after the initiator logs in. If the UA parameter is OFF, the system will automatically clear the unit attention condition when an initiator logs in. Default is ON.

## 3.5 BBM

BBM Displays/Changes the Bad Block Manager (BBM) functionality.

This command is used to enable and disable the Bad Block Manager (BBM) feature in the system. The bad blocks can be displayed, defaulted, and edited. Each LUN in the system can be configured to use the Bad Block Manager independently.

**CC\_ONLY=[ON/OFF]** This parameter is used to turn ON or OFF the Check Condition Only functionality. When ON, the Bad Block Manager generates a check condition SCSI status when attempting to read a host LBA that overlaps a bad block for the LUN specified. When OFF, the Bad Block Manager generates a check condition SCSI status but also gives the host the corrupted data when attempting to read a Host LBA deemed a BB on the system. The CC\_ONLY option is defaulted to ON.

**DEFAULT** This parameter is used to default the configuration and all entries for all LUNs. When this command is done it will have performed a 'clean' operation such that BBM will be in a completely defaulted power up state. The default configuration is as follows : BBM top level is disabled. All LUNs are disabled for BBM processing at the LUN level. Check condition on BBM will be set to also provide back data.

**DISABLE** Disables the Bad Block Manager feature in the system. This is the disable that shuts down BBM tracking at the highest level. When this is disabled, the BBM feature will not be in use for any part of the system.

**ENABLE** Enables the Bad Block Manager feature in the system. This is the highest level enable that allows the system to be able to start using the BBM. To actually put the BBM feature in use, individual LUN enables must also be activated via the 'LUN\_ENABLE' command.

**LUN\_DEFAULT** This parameter is used to default lun entries in the BBM for specified LUNs.

**LUN\_DISABLE** Disables the Bad Block Manager (BBM) feature in the system for all LUNs or a set of user specified LUNs where the Bad Block entries for that LUN will no longer be examined and no SCSI Check Condition (CC) status messages will be generated based upon the Bad Block entries for the LUN(s). While the BBM for a LUN is disabled, the user is still allowed to edit, default, and display Bad Block information on the LUN. This is the default setting.

**LUN\_DISPLAY** This parameter allows the user to display the Bad Block Manager data (including the entries in the bad block list) for all LUNs or a set of user specified LUNs.

**LUN\_EDIT[=x]** This parameter allows the user to edit the Bad Block Manager for a specified LUN. This will provide an interactive session for the user to make changes to the bad block entries.

**LUN\_ENABLE** Enables the Bad Block Manager feature in the system for all LUNs or a set of user specified LUNs where unrecoverable data conditions will be added to this LUN and the bad block entries will be managed. Bad block entries will be added for this LUN when data read from the disks do not provide enough information to recreate the host data. Bad block entries will be removed from this LUN when host data is written over an area that is considered a bad block. All reads and writes will be checked against the Bad Block Manager when the LUN is enabled for processing bad blocks. The default setting is disabled.

**LUN\_SUMMARY** This parameter allows the user to display the Bad Block Manager summary for all LUNs or a set of user specified LUNs.

## 3.6 BOOTUP

**BOOTUP** Displays/Changes the system boot settings.

This command displays the boot configuration settings of the system and allows the user to change them. The system must be rebooted before any changes will take effect. Improper use of this command can prevent the system from booting properly.

**BYPASS** Allows a unit to continue booting when the disks are missing. This parameter is not saved. Note: This can cause parameter block corruption! Restart is required to come out of the bypass mode

**CHANGE** Prompts the user to change the boot configuration settings of the system. Note: Requires Version 2.0 bootrom in order to utilize this functionality.

## 3.7 CACHE

**CACHE** Displays and adjusts the cache settings of the LUNs.

This command is used to change the performance of the system by adjusting the cache settings for the LUNs. This command will display the current cache settings for each LUN in the system and allow the user to modify them. These cache parameters are identical to the cache parameters in the SCSI caching mode page.

**DEFAULTS** This parameter will load the default settings for all of the cache parameters for the specified LUNs. This parameter will not change the WRITELIMIT or SIZE parameters. Note that when this parameter is used in combination with any of the following other parameters: WRITEBACK, PREFETCH, MAX, MF, that DEFAULTS is applied first to the specified LUNs, and these other parameters are applied after.

**HOSTCHANGEABLE=ON/OFF** This parameter enables and disables host changes to the SCSI cache mode page. When enabled (ON), the hosts are allowed to change the writeback cache setting through the SCSI cache mode page. When disabled (OFF), the host changes to the SCSI cache mode page will have no effect on the cache settings for the LUN. Default is ON.

**LUN=x** This parameter specifies the specific LUN(s) to be affected when used in combination with any of the following other parameters: DEFAULTS, MAX, MF, PREFETCH, WRITEBACK, If no LUN is specified then all LUNs will be updated by default. Valid LUN values, 'x', are 0 to 127. Default is ALL LUNs.

**MAX=x** This parameter sets the maximum prefetch ceiling, 'x', in blocks, for prefetches on read commands. This parameter is used to set an upper limit on prefetching when the MF parameter is ON. The system will automatically limit the amount of prefetching if the system is running low on resources. Valid range is 0 to 65535. Default is 65535.

**MF=ON/OFF** This parameter enables and disables the Multiplication Factor bit. If MF is OFF, the system will prefetch the number of blocks specified by the PREFETCH parameter after every read command. If MF is ON, then the system will multiply the transfer length of the command by the PREFETCH parameter to determine how much data will be prefetched. Default is ON.

**PREFETCH=x** This parameter sets the prefetch that will occur on read commands. If the MF parameter is OFF, the system will prefetch the number of blocks specified by this parameter after every read command. If the MF parameter is ON, then the system will multiply the transfer length of the command by this parameter to determine how much data will be prefetched. A prefetch value of less than 8 is recommended when the MF parameter is ON. Valid range is 0 to 65535. Default is 1.

**SIZE=x** This parameter sets the cache segment size, 'x', in KiB, for the system. This allows the user to adjust the performance of the system by changing the cache segment size to match the size of the host I/O requests. A large cache segment size may give better performance for large I/O requests and a small cache segment size may give better performance for small I/O requests. For the best performance, the cache segment size should be larger than the average host I/O request size. Use the STATS LENGTH command to determine the average host I/O request size. This command should not be used under heavy I/O conditions because the system will temporarily halt all I/O requests while the changes are taking effect. Warning: This operation will cause a cache restart to occur that will temporarily halt all IO activity until it completes. Valid segment sizes are 128, 256, 512, 1024, and 2048. Default is 1024.

**WRITEBACK=ON|OFF** This parameter enables and disables write back caching. Write back caching allows the system to increase the performance of write I/O requests by storing the data in cache and saving the data to the disks at a later time. Default is OFF.

**WRITELIMIT=x** This parameter specifies the maximum percentage of the cache that can be used for write back caching. The system will force all writeback requests to be flushed to the disks immediately if the percentage of writeback data in the cache exceeds this value. Range is 0 to 100. Default is 75.

## 3.8 COMMENT

COMMENT Echoes a message to the screen and saves it to the [LOG](#).

This command is used to echo a message to the CLI. The message is saved in the LOG and is also sent to syslog if it is enabled. Any printable text can be entered on the command line.

<message> Any printable text can be entered in the message.

## 3.9 CONSOLE

CONSOLE Displays/Changes the console settings of this unit.

This command displays information about the current serial console settings of this unit. The command also allows selection of the baud rate and the flow control settings for the serial console.

**BAUD** This option will display a list of console baud rates and allow the administrator to set a new console baud

**FLOW[=ON|OFF]** This option will display the current state of the hardware flow control settings and allow the administrator to set a new hardware flow control setting.

Default = OFF

**SOFTFLOW[=ON|OFF]** This option will display the current state of the software flow control settings (XON/XOFF) and allow the administrator to set a new flow control setting.

Default = OFF

## 3.10 DATE

DATE Displays/Changes the current system date.

Displays/Changes the current system date.

**mm dd yyyy** Allows the user to change the system date to the new value indicated by <mm> <dd> <yyyy>, where:

mm: indicates the month in the range 1..12 dd: indicates the day in the range 1..31 yyyy: indicates the year in the range 2000..2104

**Examples:**

To simply display the system date: DATE

To change the system date to Sept. 10, 2041: DATE 9 10 2041

## 3.11 DEBUG

DEBUG Enables/Disables the system debug messages.

This command is used to display and change the settings controlling the generation of the system debug messages. Each system debug message is assigned a general debug type and a specific debug level; enabling a debug level for a given debug type causes all debug messages belonging to that same type and level to be generated for display. Previously generated messages can be viewed by using the LOG command on the CLI. This command is provided for diagnostic purposes and should only be used by qualified service personnel.

**DMT\_IHD** Saving of cache nodes to persistent internal memory debug messages:

Level	Description of Messages Output:
0	Displays save high level requests.
1	– Not used. –
2	Displays save and load messages from persistent memory.
3	Displays save list entry messages.
4	– Not used. –
5	Displays save dual lockout messages.
6	IHD_RETURN_VALUES
7	IHD_FUNCTION_TRACE

## 3.12 DEFAULTS

DEFAULTS Restores the system to its default configuration.

This command is used to restore the system to its default configuration. The system will halt all I/O requests, delete all the LUNs, and restore all the parameters back to their defaults values. This is a destructive operation which will delete all the data stored in the system. The system will then ask if it should erase all the configuration information stored on the disks. This will prevent the system from retrieving the backup copies of the configuration settings from the disks after the system is restarted. This means that to read the parameter blocks off the disk, the current controller will have to be removed and replaced by another system. After the defaults have been loaded, the system will ask if it should begin reconfiguring by scanning for the disks. New LUNs can be created after the disks have been added back to the system.

The following table outlines the combinations of answers to the defaults questions and shows what the outcome will be for each combination:



Erase Configuration	Disk Scan	Outcome
Y	Y	IP address saved NVRAM cleared. Disk information is cleared. S2A remains powered up. Disk scan occurs. IP address is restored.
Y	N	IP address cleared NVRAM cleared. Disk information is cleared. S2A remains powered up.
N	N/A	IP address cleared, NVRAM cleared. Disk information is preserved. S2A powers down.
Y	Y	IP address saved, NVRAM cleared. Disk information is cleared. S2A remains powered up. Disk scan occurs. IP address is restored.
Y	N	IP address cleared, NVRAM cleared. Disk information is cleared. S2A remains powered up.
N	N/A	IP address cleared, NVRAM cleared. Disk information is preserved. S2A powers down.

### 3.13 DISK

**DISK** Displays information about the disks in the system.

This command is used to change the configuration settings for the disks in the system and monitor the status of the disk channels. The command will display the current disk configuration settings and the status of each disk channel. The **INFO=** parameter can be used to display all of the information about a disk in the system. The **LIST** parameter will display a list of the disks installed in the system and indicate how many were found.

**AGINGLIMIT=x|OFF** Sets the maximum time a command should wait in the disk command queue for. This parameter is for Hitachi SAS drives only. Each unit of this timer is 50 ms, where 0 is 50 ms. Range: 0 to 4 (50 to 250 milliseconds) or OFF. Default is 3, (200 milliseconds)

**AUTOREASSIGN=ON|OFF** Allows the user to turn on or off whether bad blocks will be reassigned when a medium error occurs on a healthy tier. Default is ON.

**CMD\_TIMEOUT=x** This parameter sets the retry disk timeout (in seconds) for an I/O request. The retry timeout value indicates the maximum amount of time that is allotted to receive a reply for each retry of an I/O request. If the I/O request does not complete within this time, it is aborted and potentially retried: if there is still time remaining in the overall disk timeout to allow for another retry, it is retried; if not, it completes with an error status. This parameter must be smaller than or equal to **TIMEOUT**. Valid range is 1 to 512 seconds. Recommended value for SAS drives is 11 seconds. Recommended value for SATA drives is 31 seconds. Setting the timeout below the recommended values can cause disk failures. Default is 31 seconds.

**DEFFECTLIST[=tc]** Allows the user to display the number of defects in the defect list for the specified disk. The defect list contains all the physical sectors on the disk that the drive has identified as bad, and to which the disk's hardware prevents access. The list is classified into two types: the permanent list and the grown list. The permanent list consists of the bad sectors that are identified by the disk manufacturer; the grown list consists of the bad sectors that are found after the disk has left the factory (and which can be added to at any time). The disk is specified by its tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>.

**DIAG[=tc]** Performs a series of diagnostics tests on the specified disk. The disk is specified by its physical tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>.

**FAIL[=tc]** This parameter tells the system to fail the specified disk at the physical tier and channel locations indicated by 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>. When a non-SPARE disk is specified: If failing the disk won't cause a multi-channel failure, the disk is marked as failed, and an attempt is made to replace it with a spare disk. When a SPARE disk is specified: If

the spare disk is currently in use as a replacement for a failed disk, then the disk that the spare is replacing is put back to a failed status, and the spare is released, but it is marked as unhealthy and unavailable.

**FAST\_FAIL=[ON|OFF]** This parameter turns on/off the fast fail mode for disks that are slow to respond to data access commands. The fast fail parameters can be customized to a particular need. Default is OFF.

**FAST\_FAIL\_THRESHOLD='num cmds'** This parameter indicates how many consecutive commands in the fast fail algorithm must occur before failing the drive for this reason. The default value is 5. Valid range = 2 - 20.

**FAST\_FAIL\_WINDOW\_END='t'** This parameter indicates the timeout in seconds for when a disk response is received outside of a window in the future. If the command finishes outside of this time value, it is not aggregated in the slow disk algorithm as it is considered a separate instance of the event and the counter will restart. The default value is 90 seconds. Valid range = 3 - 180.

**FAST\_FAIL\_WINDOW\_START='t'** This parameter indicates the timeout in seconds for when a disk response is considered slow and will count against the drive in the slow disk fail algorithm. The default value is 5 seconds. Valid range = 2 - 179.

**INFO[=tc]** This parameter displays the information and status about a specific disk in the system. The disk is specified by its physical tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>.

**LIST[=SAS\_ID|SPEED]** This parameter displays a list of all the disks installed in the system and indicates how many were found of each type. The optional SAS\_ID parameter will display the SAS ID of the device instead of the serial number. The optional SPEED parameter will display the link speed of the device instead of the RPM.

**LLFORMAT[=tc]** Allows the user to perform a low level format of a disk drive. The disk is specified by its tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>.

**MAXCMDS=x** Sets the maximum command queue depth to a tier of disks. Range: 1 to 32 commands per tier. Default: 16 commands. Setting should be as follows: - 16 if any SATA drives are used. - 32 for everything else.

**MAXREADLEN=x** Sets the maximum read command length for SATA drives in KiB. This parameter is used to increase throughput on systems with a large number of SATA tiers by reducing the contention for the SAS lanes. 128K is the recommended setting for systems with 16 tiers or more of SATA disks. 2048K is the recommended setting for systems with SAS disks. Range is 128 to 2048. Default is 128.

**MAXWRITELEN=x** Sets the maximum write command length to the drives in KiB. This parameter is provided for testing only and should normally not be changed. Range is 128 to 2048. Default is 2048.

**PLS[=t][c]** Requests/displays the PHY Link Error Status Block information for the specified drive. Note that SATA and SAS drives report PHY errors differently. The PHY information consists of the following items:

ER-ROR	SATA AAMUX PHY ERRORS Explanation
H-RX	Number of SATA FIS CRC errors received on the host port of the AAMUX
H-TX	Number of SATA R_ERR primitives received on the host port indicating a problem with the transmitter of the AAMUX
H-Link	Number of times the PHY has lost link on the host port
H-Disp	Number of frame errors for the host port of the AAMUX. These include: code error, disparity error, or realignment
O-RX	Number of SATA FIS CRC errors received on the other host port of the AAMUX
O-TX	Number of SATA R_ERR primitives received on the other host port indicating a problem with the transmitter if the AAMUX
O-Link	Number of times the PHY has lost link on the other host port
O-Disp	Number of frame errors for the other host port of the AAMUX. These include: code error, disparity error, or realignment
D-RX	Number of SATA FIS CRC errors received on the device port of the AAMUX
D-TX	Number of SATA R_ERR primitives received on the device port indicating a problem with the transmitter of the AAMUX
D-Link	Number of times the PHY has lost link on the device port
D-Disp	Number of frame errors for the device port of the AAMUX. These include: code error, disparity error, or realignment

  

Error	SAS PHY ERRORS Explanation
InvDW	Invalid DWORD Count - The number of invalid dwords received outside of the PHY reset sequence.
RunDis	Running disparity Count - The number of dwords containing running disparity errors received outside of the PHY reset sequence.
LD-WSYN	Loss of DWORD synchronization count - The number of times the PHY has lost synchronization and the link reset sequence.
PHYRES	PHY Reset Problem count - The number of times the PHY reset sequence has failed.

The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

If neither the tier nor the channel are specified, the PLS information is requested from all drives. If only the tier is specified, the PLS information is requested from all the drives on the specified tier.

**PMBIT=ON/OFF** When ON this parameter sets the PM (performance mode) bit in Seagate SAS drives mode pages. When OFF the Seagate drive uses its default performance mode settings. Default is OFF.

**QUARANTINE** Displays the of number quarantine events on this controller for each disk in the system. Only tiers with quarantine counts will be displayed. Use **QUARANTINECLEAR** to reset the quarantine counts.

**QUARANTINE=[ON/OFF]** Enables/disables the disk quarantine feature for all of the disks. A disk cannot be quarantined unless FASTAV is enabled for the LUN. Default is OFF.

**QUARANTINECLEAR** Resets the quarantine counts for all of the disks.

**QUARANTINECMDLIMIT=x** Sets the maximum number of outstanding disk commands after a good response before a quarantined disk can be put back into service. Range 0 to 32 where 0 indicates no delay before putting the disk back into service. Default is 0.

**QUARANTINETIMEOUT=x** Sets the minimum timeout before a disk can be quarantined in 16.6 millisecond increments. A disk cannot be quarantined unless FASTAV is enabled and has timed out on the command. Range 6 to 65535. Default is 12 (200 milliseconds)

**REASSIGN[=tc] [0xh** Allows for the reassigning of defective logical blocks on a disk to an area of the disk reserved for this purpose. The disk is specified by its tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>. 0xh is the hexadecimal value of the LBA (Logical Block Address) to be reassigned.

**REBUILD[=tc]ALL** This parameter tells the system to start a rebuild operation on a (presumably) already failed disk. A rebuild operation restores a failed disk to a healthy status once it completes. Note that this operation can take several hours to complete depending on the size of the disk and the speed of the rebuild operation. The speed of the rebuild operation can be adjusted with the DELAY and EXTENT parameters of the TIER command. In addition, the rebuild operation can be stopped, or paused and resumed with the TIER STOP, TIER PAUSE, and TIER RESUME commands. The TIER AUTOREBUILD command can be used to automate the rebuild process. Note that SPARE disks are handled slightly differently from other disks, in that SPARES that are not in use as an active replacement for a failed disk elsewhere in the system are simply returned to a normal healthy status by this command; SPARES that are in use are already considered healthy and are not rebuilt. The failed disk to be rebuilt is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

All failed and replaced disks can be rebuilt using the ALL parameter.

**REBUILDNOJOURNAL[=tc]ALL** This parameter tells the system to start a rebuild operation on a (presumably) already failed disk without using the journal. A rebuild operation restores a failed disk to a healthy status once it completes. Note that this operation can take several hours to complete depending on the size of the disk and the speed of the rebuild operation. The speed of the rebuild operation can be adjusted with the DELAY and EXTENT parameters of the TIER command. In addition, the rebuild operation can be stopped, or paused and resumed with the TIER STOP, TIER PAUSE, and TIER RESUME commands. The TIER AUTOREBUILD command can be used to automate the rebuild process. Note that SPARE disks are handled slightly differently from other disks, in that SPARES that are not in use as an active replacement for a failed disk elsewhere in the system are simply returned to a normal healthy status by this command; SPARES that are in use are already considered healthy and are not rebuilt. The failed disk to be rebuilt is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

All failed and replaced disks can be rebuilt using the ALL parameter.

**REBUILDVERIFY=ON/OFF** This parameter determines if the system will send SCSI Write with Verify commands to the disks when rebuilding failed disks. This feature is used to guarantee that the data on the disks is rebuilt correctly. Note: This feature will increase the time it takes for rebuilds to finish.

Default is OFF.

**REPLACE[=tc]** This parameter tells the system to replace the specified failed disk with a spare disk or replace a healthy disk that is believed to be on the verge of failing. The healthy disk replacement is referred to in the system as a proactive replacement operation. A replace operation is used to temporarily replace a disk with a healthy spare disk. This operation can take several hours to complete depending on the size of the disk and speed of the replace operation. The speed of the replace operation can be adjusted with the DELAY and EXTENT parameters of the TIER command. The disk to be replaced is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHP>.

(Note that spare disks themselves cannot be replaced with this command).

**RESTART[=tc]** This parameter tells the system to start a restart operation on a (presumably) already failed disk. The failed disk to be restarted is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

All failed and replaced disks can be restart using the ALL parameter.

**SCAN** This parameter checks each disk channel in the system for any new disks and verifies that the existing disks are in the correct location. It also starts a rebuild operation on any failed disks which pass the disk diagnostics.

**STATUS** Displays the loop status of each disk channel and a count of the fibre channel errors encountered on each channel.

**STATUSCLEAR** Resets the fibre channel error counts on each disk channel.

**TIMEOUT=x** This parameter sets the total disk timeout (in seconds) for an I/O request. The total disk timeout value indicates the total overall length of time allotted to each I/O request to complete; if an I/O request has not completed within this time frame, then an error status is reported for it. This parameter must be greater than or equal to CMD\_TIMEOUT. Valid range is 1 to 512 seconds.

- Recommended value for SAS drives is 27 seconds.
- Recommended value for SATA drives is 60 seconds.

Default is 60 seconds.

**WRITESAME=ON|OFF** Enable and disables use of the SCSI Write Same command when formatting LUNs. The SCSI Write Same command is used by the system to format a LUNs faster. This parameter is provided for backwards compatibility with disks or enclosures that do not support the SCSI Write Command.

Default is OFF.

## 3.14 DISK\_CLI

**DISK\_CLI** Sends a disk CLI command to any of the disk channels.

Sends the supplied disk CLI command and parameters to each specified disk channel.

This command is provided for diagnostic purposes and should only be used by qualified service personnel.

Usage: DISK\_CLI [DISKCPU=<CPU(s)>] [SECONDS=s] <disk CLI command>

## 3.15 DUAL

**DUAL** Displays information about the dual system configuration.

Displays information about the dual system configuration.

**COHERENCY=ON|OFF** Enables/Disables the cache coherency between the two units. Warning: Enabling cache coherency will cause a cache restart to occur that will temporarily halt all IO activity until it completes.

**FAIL** Fails the partner unit in the system.

**HEAL** Restores the partner unit in the system to a healthy status. Warning: This operation will cause a cache restart to occur that will temporarily halt all IO activity until it completes.

**LABEL=x** This parameter allows the user to change the label assigned to each unit. This allows the user to uniquely identify each unit in the system. The CLI prompt for each unit is built by adding a colon and a space at the end of the label. Each unit can have a label up to 31 characters long. Entering DEFAULT will restore the label of the unit to its default setting.

Valid values for 'x' are 1 and 2.

**SINGLET** This parameter tells the system that it is in singlet mode and not in couplet mode and only unit 1 is installed. This command will disable cache coherency, heal unit 1 if it is failed and fail unit 2 before attempting to remove it. The system may automatically add unit 2 if it is connected to the system so unit 2 should be powered off and removed from the system after the command is finished.

**TIMEOUT=x** Sets the dual cache coherency timeout for cache node requests. The timeout value is given in seconds. A value of zero allows for only one retry. It is recommended that this timeout value be smaller than the host timeout (HOST TIMEOUT=x). The valid range for 'x' is 0 to 255 seconds.

Default is 0 seconds.

## 3.16 EXIT

EXIT Allows the user to log out of a CLI or Telnet session.

Allows the user to log out of a CLI or Telnet session. For the CLI, control is returned to the general purpose user level. For the Telnet, the current session is disconnected.

## 3.17 FAULTS

FAULTS Displays all current faults, warnings and errors.

This command will display a list of all current faults, warnings and errors in the system. This provides a convenient way to quickly check the status of the system.

**ARRAYPARITY** Displays the number of LUN array parity errors detected by the system. The system saves the counts for each tier of all the LUNs.

**ARRAYPARITYCLEAR** Clears the counts of LUN array parity errors in the system.

**BUSPARITY[=ALL]** Displays the number of bus parity and data path errors detected by the system. =ALL Parameter shows the 7 day history for the bus parity errors.

**BUSPARITYCLEAR** Clears the counts of bus parity and data path errors in the system.

**DISKECC** Displays the number of ECC errors detected on the disk boards.

**DISKECCCLEAR** Clears the counts of ECC errors detected on the disk boards.

**ECCSHUTDOWN=ON|OFF** Enables or Disables the Shutdown for Unrecoverable ECC Errors. If set to ON indicates the system will shutdown for unrecoverable ECC errors. If set to OFF indicates the system will not shutdown when receiving unrecoverable ECC errors.

Default is ON.

**EXCEPTIONSHUTDOWN=ON|OFF** Enables or Disables the Shutdown for Task Exceptions. If set to ON indicates the system will shutdown for task exceptions. If set to OFF indicates the system will not shutdown on task exceptions.

Default is ON.

**MEMCLEAR** Clears the values in the memory faults (ECC) statistics.

**MEMORY** Displays the current SDRAM memory faults (ECC). Error counters will not be displayed if there are no errors.

**RECOVERYCLEAR** Clears the latched disk recovery fault code.

**RESTARTCOUNT** Display the number of I/O processor restarts that occurred due to error conditions on the I/O processors.

**RESTARTCOUNTCLEAR** Clears the I/O processor restart counters.

**SFP** Displays the current status of the host and disk SFPs.

---

**Note:** A transmitter fault and a loss of signal on a disk channel or host port may indicate that there is no connection at the corresponding connector.

---

## 3.18 HELP

**HELP** Displays help information about system commands.

By default, this command will display a list of all the available system commands. This command will also display detailed information about a specific command if one is specified. Information about the specific parameters of a command can be displayed if the command is specified followed by the parameters of interest.

Usage:

```
HELP|?
HELP|? <command>
HELP|? <command> <parameter, parameter, ...>
(and as a special exception to the usual method of command order:
<command> HELP|?
<command> HELP|? <parameter, parameter, ...>
```

For example:

```
# To display detailed help on the help command:
HELP HELP
# To display detailed help on any parameters beginning
# with a 'P' for the help command:
HELP HELP P
```

**SHORT** Displays a shorter form of help for the command(s) and/or parameter(s). This flag only applies to the current **HELP** command's execution. It must appear immediately adjacent to the **HELP** command in order to be honored with it.

## 3.19 HOST

**HOST** Displays information about the host fibre channel ports.

This command is used to change the configuration settings for the host fibre channel ports in the system and monitor their status. The command will display the current settings and status for each host port. This command will also display a list of the host users currently logged into the system.

**CONTROLPAGE** This command allows the user to view the current settings of the SCSI Control Mode page (0x0A) for each host port.

**ERRORPAGE** This command allows the user to view the current settings of the SCSI Error Recovery Mode page (0x01) for each host port.

**FRAME\_SIZE** This parameter allows the user to set/change the maximum transmit data frame size per host port(s). The user is prompted for the desired transmit size as well as for the choice of the host port(s).

**GUIDS** Displays additional information about the GUIDs of our HCAs.

**IBUSERS** Displays additional information about all IB users logged in.

**ID=x** This parameter changes the hard loop ID of a host port. The supplied value, 'x', is the fibre channel AL PA value which will be used by the host port. The system will select a soft ID if the hard loop ID is already taken by another device. Refer to the manual for a list of valid loop IDs. This parameter is entered as an 8-bit hex value.

Default is EF.

**LIPINFO** Shows the last LILP payload for all host ports.

**PORT=x|ALL** This parameter specifies the specific host port(s) to be affected when used in combination with any of the following other parameters:

- ID,
- TIMEOUT,
- WWN.

(If PORT is left unspecified, the user is prompted for his choice of host ports). Valid port values, 'x', are 1 to 4.

Default is ALL host ports.

**QERR=0|1** This parameter allows the user to change the queue error management (QERR) field in the SCSI Control Mode page. This parameter determines what action is taken when a host command is terminated with check condition. When QERR=0, all outstanding host commands will resume after the ACA condition is cleared. When QERR=1, all outstanding host commands for the affected initiator will be aborted. The system only supports a TAS bit of 1 so no other initiators are affected.

Default is 0.

**SPEED** This parameter allows the user to set/change the port speed on the host port(s). The user is prompted for the desired speed as well as for the choice of the host port(s). Note: When displaying the speed settings (which can be done using the 'HOST' command), the following acronyms are used:

- Gbps - Gigabits per second
- NA - Not Applicable

**STATUS** Displays the loop status of each host port and a count of the fibre channel errors encountered on each port.

**STATUSCLEAR** Resets the fibre channel error counts on each port.

**TIMEOUT=x** This parameter sets the host command timeout for an I/O request to the value specified by 'x'. The valid range for 'x' is 1 to 512 seconds.

Default is 75 seconds.

**WWN=x|DEFAULT** This parameter is used to override the system ID and specify a different World Wide Name for a host port. The new World Wide Name value may be entered as one of:

- 'x' : a 64-bit hex value,
- DEFAULT : Resets the World Wide name back to the default settings.



## 3.20 IHD

IHD Displays and adjusts the IHD settings.

This command is used to format, display, and trigger IHD activities in the system.

**AUTO\_BACKUP=[ON|OFF]** This parameter enables and disables the automatic backups of the cache to occur is a power event is detected.

Default is OFF.

**BACKUP** Cache will be backed up on the Internal Hard Drive. Host I/O will not be accepted after running this command.

**FORMAT** This parameter will format an internal hard drive to a default state for use in an S2A. This command will prompt for the hard drive and will look at the drive ownership state to determine if the format request can be processed at this time.

**IHD\_APP=[ON|OFF]** This parameter enables and disables the IHD Application. A restart is required for the change to take an effect.

Default is OFF.

**RESTORE[=x]** Cache will be restored from the Internal Hard Drive. Host I/O will be accepted after running this command. An optional parameter LUN can be provided to the call to ONLY restore and clear that LUN information from the IHD. Host I/O will be accepted after running this command. This command accepts the following :

- No parameter means RESTORE ALL
- =ALL parameter means RESTORE ALL
- ='x' where x is a lun means RESTORE LUN x

**RESTORE\_REPORT[=x]** The IHD will be scanned and provide a report of what is available on the IHD for data. An optional parameter LUN can be provided to the call to ONLY check for a single LUNs information from the IHD. Host I/O will be accepted after running this command.

## 3.21 LICENSE

LICENSE Displays information about the license installed on the S2A.

Provides mechanism to install license on S2A using TFTP protocol or by using CLI.

**INSTALL** Allows user to perform licensing using CLI prompt. This is limited for files 100KiB in size.

**INSTALL\_TFTP** Allows user to perform licensing using TFTP protocol.

## 3.22 LOG

LOG Displays a log of previous system messages.

This command is used to display a log of previous system messages. The log is saved in non-volatile memory and will automatically roll over when full.

**CHECKCLEAR** Clears the Check Condition Log.

**CHECKCONDITION|CHECKCONDITION=MORE** Displays the Check Condition Log. 'MORE' will display additional information concerning the check condition.

**CLEAR** Allows the user to clear the log of all previous messages.

**DISKFAILCLEAR** Clears the Disk Fail Log.

**DISKFAIL|DISKFAIL=MORE** Displays the Disk Fail Condition Log. 'MORE' will display additional information concerning why the disk failed.

**FILTER=EMERG|ALERT|CRITICAL|ERROR|WARNING|NOTICE|INFO|DEBUG** Allows the user to filter the display of the MLS log according to what level of message they would like to view. When using the FILTER command the log will show messages at the specified priority level and all of the messages above the specified priority level.

**FILTERCPU** Allows the user to filter the display of the MLS log according to what card slot the message came from. When using the FILTERCPU command the log will show messages of the specified slot ID.

**LINES=x** Specifies the number of lines that should be displayed from the end of the log specified.

## 3.23 LOGIN

LOGIN Allows the user to log into a CLI or Telnet session.

Allows the user to log into a new CLI or Telnet session (i.e. at a specific security level).

<login name> Indicates which login level the user wishes to log in under.

## 3.24 LOGOUT

LOGOUT Allows the user to log out of a CLI or Telnet session.

Allows the user to log out of a CLI or Telnet session. For the CLI, control is returned to the general purpose user level. For the Telnet, the current session is disconnected.

## 3.25 LUN

LUN Displays the status of, or Adds/Removes LUNs. This command is used to change the configuration settings for the LUNs in the system and to monitor their status. This command allows the user to create LUNs with the ADD parameter and delete LUNs with the DEL parameter. The FORMAT parameter can be used to format LUNs after they are created. A LUN must be formatted before it can be used. The ADD parameter will prompt the user to format a LUN after it has been added to the system. The speed of the LUN format operations can be adjusted with the DELAY and EXTENT parameters of the TIER command.

**ADD[=x]** This parameter will add a 64-bit LUN to the system. The system will prompt the user for all the necessary information to create the LUN and will indicate if the LUN was successfully added to the system. The system can support up to 1024 LUNs. The LUN to be added can be specified by 'x', where 'x' is in the range 0..1023.

**ADD32[=x]** This parameter will add a 32-bit LUN to the system. The system will prompt the user for all the necessary information to create the LUN and will indicate if the LUN was successfully added to the system. The system can support up to 1024 LUNs. The maximum capacity of a 32-bit LUN is limited to 0xFFFF0000 host blocks.

Block size	Maximum Capacity
512	2.097.120 MiB
1024	4.194.240 MiB
2048	8.388.480 MiB
4096	16.776.960 MiB

The LUN to be added can be specified by 'x', where 'x' is in the range 0..1023.

**ADD64[=x]** This parameter will add a 64-bit LUN to the system. The system will prompt the user for all the necessary information to create the LUN and will indicate if the LUN was successfully added to the system. The system can support up to 1024 LUNs.

The LUN to be added can be specified by 'x', where 'x' is in the range 0..1023.

**APTPL** This parameter allows the user to enable SCSI 3 persistent reservations support for AIX Host on a specific LUN

**APTPL=ALL** This parameter allows the user to enable SCSI 3 persistent reservations support for AIX Host on all valid LUNs

**CONFIG** Display the configuration information about all the valid LUNs in the system.

**DELAY=x** This parameter sets the system verify delay value to 'x'. The verify delay value determines how long a verify operation will pause after it reaches the verify extent. This parameter slows down the verify operation so that it will not affect the performance of the system. This value is in 100 millisecond increments. The range for 'x' is 0 to 1000.

**DEL|DELETE[=x]** This parameter will delete a LUN, 'x', from the system. It will delete all of the data in the LUN. The LUN to be deleted can be specified by 'x', where 'x' is in the range 0..1023.

**EXTENT=x** This parameter sets the system verify extent value, 'x', in MiB. The verify extent determines how much data can be verified before the verify operation must pause. This parameter slows down the verify operation so that it will not affect the performance of the system. Increasing the extent value will allow more data to be verified in a single pass. The range for 'x' is 1 to 128 MiB.

**FORMAT[=x]** This parameter will perform a destructive initialization of a LUN by over-writing all the data on the LUN with zeroes. The LUN to be formatted can be specified by 'x', where 'x' is in the range 0..1023.

**LABEL[=x]** This parameter allows the user to change the label of the LUN. A LUN label can be up to 16 characters long. The LUN to be labeled can be specified by 'x', where 'x' is in the range 0..1023.

**LIST** Display a list of all valid LUNs in the system. The list shows the capacity, owner, status and serial number of each LUN.

The following is a list of possible statuses and their definitions:

- 'Not Installed' - The LUN does not exist.
- 'Config Error' - The LUN has a configuration error.
- 'Unavailable' - Cache data for the LUN is being purged. This is done when the LUN is being deleted or mirrored by the other unit in the system.
- 'Not Ready' - The unit is still booting up.
- 'Stopped' - The unit was stopped.
- 'Unformatted' - The LUN has not been formatted.
- 'Critical' - The LUN has a failed disk.
- 'Critical [GHS]' - The LUN has a failed disk and a disk that is replaced by a spare.
- 'Degraded' - The LUN has a failed disk (8+2 Only).
- 'Degraded [GHS]' - The LUN has a failed disk and a disk that is replaced by a spare (8+2 Only).
- 'Ready [GHS]' - The LUN has a replaced disk.
- 'Ready' - The LUN is OK.

**[LOCK[=x]]** This parameter will lock a LUN in the data cache. It will keep all of the data for the LUN in the cache for faster access. Up to 50 percent of the data cache can be used for locking LUNs. The LUN to be locked can be specified by 'x', where 'x' is in the range 0..1023.

**LOCKOUT\_CLEAR=type** This parameter is used to clear a lockout code on the prompted LUN so that admin can clear an event from a particular lun. Clearing this field will remove the lockout state from the LUN regardless of the enabled setting at the system level.

- 'ALL' - Disables system from locking out LUNs from all reasons below
- 'BBM' - Disables system from lockint out LUNs when BBM is enabled and crosses a shutdown threshold or becomes full.
- 'UNIT\_PROBLEM' - Disables system from locking out LUNs when it is determined that the problem could cause potential data loss.

**LOCKOUT\_DISABLE=type** This parameter specifies whether or not the system can determine when a LUN should NOT be locked out from new host accesses. Regardless of what state the system determines, we cannot lockout host access at run time due to the lockout type.

- 'ALL' - Disables system from locking out LUNs from all reasons below
- 'BBM' - Disables system from locking out LUNs when BBM is enabled and crosses a shutdown threshold or becomes full.
- 'UNIT\_PROBLEM' - Disables system from locking out LUNs when it is determined that the problem could cause potential data loss.

**LOCKOUT\_ENABLE=type** This parameter specifies whether or not the system can determine when a LUN should be locked out from new host accesses. Examples of when a LUN will be locked out internally would be when the BBM is enabled and becomes full. Another example would be when a multi-channel failure exists on the LUN. The default setting of the parameter is 0, indicating no internal reasons can cause a lun to be locked out from a host.

- 'ALL' - Allows system to restrict LUNs from all reasons below
- 'BBM' - Allows system to restrict LUNs when BBM is enabled and crosses a shutdown threshold or becomes full.
- 'UNIT\_PROBLEM' - Allows system to restrict LUNs when it is determined that the problem could cause potential data loss.

**MOVE[=x]** This parameter will change the ownership of a LUN from one unit to the other when the units are in dual mode. This command will override all the configuration checks and allow the user to move any LUN. The system will display a list of all the tiers and other LUNs that need to be moved in order to move the LUN specified. The LUNs should not be moved while any unit in the system has active format, verify, rebuild or mirror operations. The LUN to be moved can be specified by 'x', where 'x' is in the range 0..1023.

**PAUSE[=x]** This parameter will pause all active LUN maintenance operations including format, verify and mirror operations. A single LUN can be specified 'x', where 'x' is in the range 0..1023.

**RELEASE[=x][=ALL]** This parameter allows the user to release all SCSI reservations and registrations on the LUN. The command LUN RESERVATIONS can be used to view the current SCSI reservations and registrations on the LUNs. All LUNs can be specified by RELEASE=ALL or a singe LUN can be specified by 'x', where 'x' is in the range 0..1023.

**RESERVATIONS[=x]** This command displays the current SCSI reservations and registrations on the LUNs in the system. The system supports the following types of SCSI reservations:

- SPC-2 - Compatible with SPC-2
- Wr\_Ex - Write Exclusive

- Excl - Exclusive access
- Wr\_RO - Write exclusive registrants only
- Ex\_RO - Exclusive access registrants only
- REG - Indicates a SCSI registration on the LUN.

The 'Port' column indicates the unit and host port the reservation or registration was made on. A specific LUN can be viewed by 'x', where 'x' is in the range 0..1023.

**RESUME[=x]** This parameter will release all the paused LUN maintenance operations including format, verify and mirror operations. A single LUN can be specified 'x', where 'x' is in the range 0..1023.

**START** This parameter allows the user to start all the LUNs that have been stopped by a SCSI START/STOP request. This parameter is not related to the STOP parameter.

**STOP[=x]** This parameter will abort all active LUN maintenance operations including format, verify and mirror operations. A single LUN can be specified 'x', where 'x' is in the range 0..1023. Note that it does not, however, change the Background Verify setting for the affected LUN(s). Use 'LUN VERIFY=OFF' to change the Background Verify setting for a LUN.

**UNASSIGN\_LIST** This parameter allows the user to view the system LUNs that have not been assigned to a user or port.

**UNLOCK[=x]** This parameter will unlock a LUN and release the cache locked by the LUN. The LUN to be unlocked can be specified by 'x', where 'x' is in the range 0..1023.

**VERIFY** Displays the current background verify settings for all LUNs in the system.

**VERIFY=ON/OFF** Prompts the user for a list of LUNs on which background verify will be turned either ON or OFF. The 'VERIFY=ON' argument will turn on background verify for the specified LUN(s), optionally running in continuous mode. A 'VERIFY=OFF' command, however, only turns off the Background Verify setting for the specified LUN(s). Therefore, any verifies already active on the LUN(s) will not terminate until after the completion of that verify's current iteration. To stop all Verify operations immediately, use 'LUN STOP'.

**VERIFY=x** Turns ON background verify for LUN 'x', where 'x' is in the range 0..1023.

**VERIFYCLEAR[=x|ALL]** This parameter allows the user to clear the verify count and the time of last verify for a specific LUN designated by 'x' or all LUNs.

## 3.26 MEMORY

**MEMORY** Displays the unit's current memory usage information.

Displays the unit's current memory usage information. This command is intended for debugging purposes only.

## 3.27 NETWORK

**NETWORK** Displays/Changes the system's network and IP settings.

This commands displays the current network settings of the system and allows the user to change them.

**API\_PORT=x** Changes the API Server port number for this unit to that specified by 'x'. The system must be restarted before the changes will take effect. Valid ports are 0 to 32767. Note however, that the results may be unpredictable if the port number chosen is already in use (on this unit) by either the TELNET or SYSLOG facilities.

Default port is 8008.

**API\_SERVER=ON|OFF** Specifies whether or not the API Server capability is active. The API interface relies on an active and enabled API Server for its communications with the system. The system must be restarted before the changes will take effect. Note: To affect the API Server connection availability only temporarily during the current power-cycle, refer to the API ENABLE/DISABLE command.

**FIREWALL=ON|OFF** Enables/disables the network firewall.

Default value is ON.

**GATEWAY=aaa.bbb.ccc.ddd** Sets the current gateway in the network routing table to the supplied Internet address. The gateway is where IP datagrams are routed when there is no specific routing table entry available for the destination IP network or host. Note that GATEWAY= (with no Internet address) will clear out the current gateway.

IP=aaa.bbb.ccc.ddd Changes the IP address of the system. Warning: Changing the network IP address may temporarily shutdown cache coherency until the operation completes.

**LEGACY\_SNMP\_TRAP=ON|OFF** Specifies whether or not the SNMP generic traps will use a format that corresponds to the current MIB or an older format.

Default is OFF.

**LIMIT\_SNMP=ON|OFF** Specifies whether or not the SNMP functionality will only report component-level information, or all levels of information.

Default is OFF.

**NETMASK=aaa.bbb.ccc.ddd** Changes the netmask of the system.

**PING=PARTNER** Attempts to ping the partner unit.

**PING=aaa.bbb.ccc.ddd** Attempts to ping the specified destination with a single packet.

**PRIVATE** Displays information about the private network device.

**SNMP=ON|OFF** Specifies whether or not the SNMP trap functionality is active. The system must be restarted before the changes will take effect.

**SNMP\_FIREWALL=ON|OFF** Specifies whether or not SNMP is active or fully disabled. This function requires the main Firewall to be active. Turning on the SNMP Firewall will disable IHD functionality and will prevent communication with the UPS.

Default is OFF.

**SNTP=ON|OFF** Specifies whether or not the system will periodically poll a STNP server for the time. The STNP time server IP address is specified by NETWORK SNTPIP=aaa.bbb.ccc.ddd. The system will poll the timer server at 8 hour intervals. If the time update fails then the system will wait a minimum of 1 minute before polling again. An additional minute will be added to the delay after each failure until the maximum delay of 8 hours is reached. This will prevent the system from polling excessively on failures. An immediate update can be requested using the command TIME GETTIME or TIME GETTIME=aaa.bbb.ccc.ddd.

The default setting is OFF.

**SNTPIP=aaa.bbb.ccc.ddd** Specifies an IP address of a STNP time server for the system to poll.

**SYSLOG=ON|OFF** Specifies whether or not the Syslog capability is active.

**SYSLOGIP=aaa.bbb.ccc.ddd or aaaa:bbbb:cccc:dddd:eeee:ffff:gggg:hhhh** Changes the destination IP address for syslog packets. If the unit is coupled with a second unit and setup for dual mode, both units in the system will share the same syslog destination IP address but each unit can specify a different destination port.

**SYSLOGPORT=x** Changes the destination port number for syslog packets for this unit. If the unit is coupled with a second unit and setup for dual mode, both units in the system will share the same syslog destination IP address but each unit can specify a different destination port. Valid ports are 0 to 32767. Note however, that the results

may be unpredictable if the port number chosen is already in use (on this unit) by either the TELNET or API facilities. Default port is 514.

TELNET=ON/OFF Specifies whether or not the Telnet capability is active. The system must be restarted before the changes will take effect.

---

**Note:** To affect telnet session availability only temporarily during the current power-cycle, refer to the TELNET ENABLE/DISABLE command.

---

**TELNETLOGIN=x** Changes the maximum number of seconds the system will wait for a new character during a Telnet login attempt to 'x'. The system will allow 3 login attempts before disconnecting the session. Valid wait times in seconds are 0 to 300 where 0 indicates to use the default of 120 seconds (2 minutes.) Default value is 0.

**TELNETPORT=x** Changes the Telnet port number for this unit to that specified by 'x'. The system must be restarted before the changes will take effect. Valid ports are 0 to 32767. Note however, that the results may be unpredictable if the port number chosen is already in use (on this unit) by either the API or SYSLOG facilities. Default port is 23.

**TRAPIP=aaa.bbb.ccc.ddd or aaaa:bbbb:cccc:dddd:eeee:ffff:gggg:hhhh** Changes the destination IP address for SNMP trap packets. The system must be restarted before the changes will take effect.

**USAGE** Displays the address resolution protocol map. Also, displays ICMP (ping), general network, and IP, TCP, and UDP layer statistics.

## 3.28 PASSWORD

**PASSWORD** Changes the CLI and Telnet usernames and passwords.

This command allows the user to change the CLI's (and Telnet's) administrative and general purpose login name(s) and password(s). Login names may be no more than 10 characters in length. Passwords must be between 8 and 40 characters in length.

**DEFAULTS** Allows the user to reset all the login names and passwords to their default values.

## 3.29 PCI

**PCI** Displays PCI Device and Header information.

Displays Error and Error Header Log Information of Main And Hosts.

**ERR\_SHOW=HOST12** Display HOST12 CPU ATUE Errors.

**ERR\_SHOW=HOST34** Display HOST23 CPU ATUE Errors.

**ERR\_SHOW=MAIN** Display MAIN CPU ATUE Errors.

## 3.30 POWER

**POWER** Configures and displays the power information in the system.

Configures and displays the power information in the system.

**STATUS[=ALL]** Displays the current system power status. If only status is provided a text display will be provided. If STATUS=ALL is input, then a text input and a graphical indication of the system power will be displayed.

**UPS\_IP=aaa.bbb.ccc.ddd** Sets the IP for the UPS SNMP Server.

**UPS\_MONITOR=OFF|ON** This parameter enables and disables the UPS monitoring via SNMP. Default is ON.

**UPS\_PROBE** Performs a network probe for the UPS on the given IP address. The probe will only discover and talk to known and supported UPS devices.

## 3.31 RESTART

**RESTART** Performs a restart of the system.

This command will prepare the system to be restarted. The system will halt all I/O requests and save the data to the disks before restarting. The restart process may take several minutes to complete.

**DELAY=x** Performs a restart of the unit in 'x' minutes. 'x' may be any number between 0 and 255.

**DUAL** Will restart both this unit and the other unit.

**KILL** Stops a timed restart that is in progress.

## 3.32 ROUTE

**ROUTE** Displays/Updates the unit's IP routing table.

This command allows the user to display/update the current IP routing table of the unit.

**ADD[=[aaa.bbb.ccc.ddd] [GATEWAY=aaa.bbb.ccc.ddd]]** Allows the user to add a host route to the network routing tables, where 'aaa.bbb.ccc.ddd' represents a standard Internet address. For example: To indicate that the machine with Internet address 91.0.0.3 is the gateway to the destination host 90.0.0.0, enter: **ROUTE ADD=90.0.0.0 GATEWAY=91.0.0.3** Up to 6 permanent routes can be added to the routing table.

**DEL|DELETE[=[aaa.bbb.ccc.ddd] [GATEWAY=aaa.bbb.ccc.ddd]]** Allows the user to delete a gateway from the network routing table, where 'aaa.bbb.ccc.ddd' represents a standard Internet address.

**GATEWAY[=[aaa.bbb.ccc.ddd]** Sets the current gateway in the network routing table to the supplied Internet address. The gateway is where IP datagrams are routed when there is no specific routing table entry available for the destination IP network or host. If an empty gateway value is provided then the current gateway is

## 3.33 SAVE

**SAVE** Saves the parameter blocks.

This command is used to save the system configuration to non-volatile memory. Backup copies of the system configuration are also saved on the disks. The system will automatically save and update the backup copies when changes are made to the system configuration or status.

**STATUS** Displays the current status of the system parameters.

## 3.34 SES

**SES** Displays all current disk enclosure faults.

This command will display a list of all current enclosure faults detected by the SCSI Enclosure Services (SES) as well as provide a means to access SES specific functions such as disk, channel, lun, or tier visual identification.



**DOWNLOAD** Allows the operator to Download firmware to the enclosures. During downloading, SES will suspend enclosure monitoring.

**ENCLRESET=tc** This parameter commands the system to send a RESET command to a specific enclosure, 'tc', where 't' is the tier and 'c' is the channel of the enclosure. The valid range for 't' is <1..128>. The valid range for 'c' is <ABCDEFGHPS>.

**EVENTLOG=tc** This parameter commands the system to get and print to the console an Event Log from the specified enclosure, 'tc', where 't' is the tier and 'c' is the channel of the enclosure. The valid range for 't' is <1..128>. The valid range for 'c' is <ABCDEFGHPS>.

**ID=OFF** This parameter clears the visual indication task that is currently in progress and restores the system to its original visual state.

**IDCHANNEL=c** This parameter commands the system to provide a visual indication of the specified channel, 'c'. The valid range for 'c' is <ABCDEFGHPS>.

**IDDISK=tc** This parameter commands the system to provide a visual indication of the specified drive, 'tc', where 't' is the tier and 'c' is the channel. The valid range for 't' is <1..128>. The valid range for 'c' is <ABCDEFGHPS>.

**IDLUN=n** This parameter commands the system to provide a visual indication of the specified LUN, 'n'. The valid range for 'n' is <0..the max. number of LUNs> (which is set at 128 in the current system).

**IDTIER=t** This parameter commands the system to provide a visual indication of the specified tier, 't'. The valid range for 't' is <1..128>.

**MUTE=c** This parameter commands the system to mute the enclosure alarms on the specified channel, 'c'. The valid range for 'c' is <ABCDEFGHPS>.

**M\_WAIT** This parameter displays the current value for the SES device monitoring rate. The value is given in seconds.

**M\_WAIT=x** This parameter sets the SES device monitoring rate for the system to 'x'. The monitoring rate is given in seconds. The valid range for 'x' is <4..90>.

**Warning:** Improper use of this command can prevent the SES monitors from detecting an enclosure fault before the enclosure automatically shuts down.

**OFF** Allows the user to save the SES state to the parameter blocks, and shutdown the SES monitors.

**ON** Allows the user to save the SES state to the parameter blocks, and startup the SES monitors.

**SHOW=tc** Allows the user to display the configuration information and the status information returned from an SES Enclosure Status page for the SES device for the specified drive, 'tc', where 't' is the tier and 'c' is the channel. The valid range for 't' is <1..128>. The valid range for 'c' is <ABCDEFGHPS>.

**SHOWALL** Allows the user to display all configuration information for all the SES devices on all channels.

**SHOWDEVICES** Allows the user to display all the SES devices on all channels.

**UNMUTE=c** This parameter commands the system to unmute the enclosure alarms on the specified channel, 'c'. The valid range for 'c' is <ABCDEFGHPS>.

## 3.35 SETTINGS

**SETTINGS** Displays/Changes the CLI/Telnet session control settings.

This command allows the user to display/change the CLI's (and Telnet's) various session control settings.

**DEFAULTS** Allows the user to reset all the CLI and telnet session control settings to their default values.

**LINES[=x]** This parameter displays or sets the number of lines displayed at a time in a page of screen information. Pages provide a way to control the amount of information displayed to the user at one time. The user is prompted to either press a specified key in order to scroll from one page to the next, or, (in certain circumstances) to terminate the display entirely. Valid range is 0 to 512 lines, where 0 indicates that no paging is to be performed on the output information.

Default is 0.

**PROMPTINFO=ON|OFF** This parameter enables and disables extra status information in the CLI prompt. When enabled, the CLI prompt will indicate if the system is booting (BOOTING), failed (FAILED) or waiting for a restart (RESTART NEEDED).

Default is enabled.

## 3.36 SFP

SFP Displays information about the host SFPs.

This command is used to display information about the host SFPs.

**HOSTDIAG** This parameter specifies that the SFP diagnostic information for ports specified by the **PORT** parameter will be displayed. If **PORT** is not supplied, it will prompt for port(s).

**HOSTINFO** This parameter specifies that the SFP information for ports specified by the **PORT** parameter will be displayed. If **PORT** is not supplied, it will prompt for port(s).

**PORT=x|ALL** This parameter specifies the specific host port(s) to be displayed when used in combination with any of the following other parameters:

- **HOSTINFO**,
- **HOSTDIAG**.

(If **PORT** is left unspecified, the user is prompted for his choice of host ports).

Valid port values, 'x', are 1 to 4.

## 3.37 SHOWALL

SHOWALL Displays the output from essential CLI commands.

This command displays the output from a collection of essential CLI commands that, taken all together, present a comprehensive view of the system's current configuration. In order, this command shows the results from each of the following commands:

TIME, DATE, VERSION, VERSION HOST, VERSION DISK, VERSION AVR, VERSION IHD, UPTIME, TIER, TIER CONFIG, TIER VERIFY, TIER MAP, TIER JOURNAL, LUN, LUN CONFIG, LUN VERIFY, LUN LIST, CACHE, AV, DISK, DISK LIST, DISK STATUS, DISK CMDINFO, DUAL, HOST, HOST STATUS, HOST TASKINFO, MIRROR, NETWORK, SPARE, USER, USER CONNECTIONS, USER SHOWMAP, ZONING, STATS, STATS DELAY, STATS TIERDELAY, STATS OFFSET, STATS LENGTH, STATS TIERLENGTH, STATS LENGTH, STATS TIERLENGTH, STATS DISKPIECES, FAULTS, LOG CHECKCONDITION, LOG UCCLOG, LOG EXCEPTION, and LOG.

**CONFIG** This command shows all the output for configuration related CLI commands that, taken all together, present a comprehensive view of the system's current configuration. In order, this command shows the results from each of the following commands:

TIME, DATE, VERSION, VERSION HOST, VERSION DISK, VERSION AVR, VERSION IHD, UP-TIME, TIER, TIER CONFIG, TIER VERIFY, TIER MAP, TIER JOURNAL, LUN, LUN CONFIG, LUN VERIFY, LUN LIST, CACHE, AV, DISK, DISK LIST, DISK STATUS, DISK CMDINFO, DUAL, HOST, HOST STATUS, HOST TASKINFO, MIRROR, NETWORK, SPARE, USER, USER CONNECTIONS, USER SHOWMAP, ZONING.

**PERF** This command shows all the performance related CLI commands that taken all together, present a comprehensive view of the system's performance. In order, this command shows the results from each of the following commands:

STATS, STATS DELAY, STATS TIERDELAY, STATS OFFSET, STATS LENGTH, STATS TIERLENGTH, STATS LENGTH, STATS TIERLENGTH, STATS DISKPIECES, FAULTS, LOG CHECKCONDITION, LOG UCCLOG, LOG EXCEPTION, and LOG.

### 3.38 SHUTDOWN

**SHUTDOWN** Performs a shutdown of the system.

This command will prepare the system to be shutdown. All hosts and users actively using this system should be safely shutdown before using this command. The system will halt all I/O requests and save the data to the disks. The unit can be safely turned off after using this command. Once shutdown is complete, either all power supplies must either first be switched off, or else their plug should be pulled out of its socket. Power must be removed from the system for at least 10 seconds before it will start up again.

**DELAY=x** Performs a shutdown of the unit in 'x' minutes. 'x' may be any number between 0 and 255.

**DUAL** Will shutdown both this unit and the other unit.

**KILL** Stops a timed shutdown that is in progress.

**RESTART[=x]** Performs a Hard Restart of the unit by cycling the power, where 'x' indicates the number of seconds before the unit powers up again. 'x' may be any number between 1 and 127. If a time, 'x', is not specified, the default delay will be 15 seconds. Note: you can not use both the DUAL and RESTART parameters together with this command.

**SPINDOWN** Spindown all non-PB SATA drives before performing a shutdown.

### 3.39 SMART

**SMART** Control and Display SMART facilities on the disk.

This command is used to configure and display SMART facilities on the disk. It can be used to enable and disable SMART, retrieve SMART data from the disks and display to the user, start self tests on the disks and retrieve test results and display to the user. It can also be used to display the vendor specific SMART data on any specified disk.

**ABORTSELFTEST=ALL** Request to abort BACKGROUND SELF TESTS on all disks. This command only works for SAS Disks.

**ABORTSELFTEST=tc** Request to abort BACKGROUND SELF TESTS on the specified disk. This command only works for SAS Disks. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**CLEAR=ALL** Clears all SMART trips on all drives.

**CLEAR=tc** Clears SMART trips on specified drives. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**DATA=tc** Displays all the SMART information for the specified disk. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**DISABLE** Disables SMART for all the disks.

**ENABLE** Enables SMART for all the disks.

**INTERVALTIME** Displays the interval (in hours) that SMART Information will be polled for.

**INTERVALTIME=h** Sets the interval (in hours) that SMART Information polling will occur. 'h' indicates the interval in hours in the range <1..24>.

**LOG=ALL** Displays the SELF TEST LOG stored on all installed disks. This command only works for SAS Disks.

**LOG=tc** Displays the SELF TEST LOG stored on the specified disk. This command only works for SAS Disks. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**SELFTEST=ALL [testtype]** Request to start a specified SELF TEST on all installed SAS disks. This command only works for SAS Disks. The type of test is specified as one of the following.

- 0 : DEFAULT SELF TEST
- 1 : BACKGROUND SHORT SELF TEST
- 2 : BACKGROUND EXTENDED SELF TEST

**SELFTEST=tc [testtype]** Request to start a specified SELF TEST on the specified disk. This command only works for SAS Disks. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

The type of test is specified as one of the following.

- 0 : DEFAULT SELF TEST
- 1 : BACKGROUND SHORT SELF TEST
- 2 : BACKGROUND EXTENDED SELF TEST

**STATUS=tc** Displays SMART ENABLE STATUS of the specified disk. Displays if the information exception is enabled and if Temperature warning is enabled or not. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**TEST=OFF** Disables the TEST Bit in the Information Exception Mode Page for all disks. TEST Bit disabled will stop simulating a SMART trip condition.

---

**Note:** This command currently works only with SAS Disks.

---

**TEST=ON** Enables the TEST Bit in the Information Exception Mode Page for all disks. TEST Bit set will simulate a SMART trip condition and a FALSE ALARM is raised.

---

**Note:** This command currently works only with SAS Disks.

---

**UPDATE** This parameter tells the system to recheck all of the mode parameters for the disks in the system. This allows the user to update the disk mode parameters after changing the SMART capability instead of changing them one at a time.

## 3.40 SPARE

SPARE Displays information about the spares in the system.

This command is used to change the configuration settings for the spare background diagnostics in the system. The command will display the current spare configuration settings as well as task status. The INFO parameter can be used to display all of the information about a specific spare in the system. The default output will provide a snapshot of the current test status of all spares, any tests in progress, and the status of the spare task. Spare diagnostics are automatically disabled when the unit is in a failed state. When the diagnostics are started, a search algorithm is run to select a disk for testing. Disks will be selected with the following restrictions:

1. the disk must pass diagnostics, ie. cli command disk diag
2. the disk has not been tested within the present calendar month

If no disks are found for testing within the search algorithm, the test software will sleep for 24 hours before searching for disks to test again. If the user wants to force a new search algorithm to run, the spare start command can be executed and that will awaken the test software immediately.

**CLEAN[=tc]** This parameter will erase any previous test data stored on the disk. The disk is specified by its physical tier and channel locations, 'tc', where:

- 't' indicates the tier in the range <1..128>, and
- 'c' indicates the channel in the range <ABCDEFGHPS>.

**COVERAGE=x** This parameter sets the spare diagnostic coverage of the blocks being tested as a percent of the total number of blocks available for test. Note that increasing the coverage to higher numbers means that more blocks on the disk will be tested for better coverage but it also will take a longer time for the test to complete. This parameter can be tuned to provide an optimal test time for a single disk in the system such that all spares are tested in a reasonable amount of time. The parameter is limited to a discrete set of values. The valid parameters for 'x' are [1, 5, 10, 20, 40, 80, 100] Percent.

Default is 1 Percent.

**DELAY=x** This parameter sets the system spare diagnostics delay. The test delay determines how long a test operation will pause after it reaches the test EXTENT. This parameter slows down the spare test so it will not affect the performance of the system. Any changes applied to delay will affect tests in progress as well as future testing. This system spare diagnostic delay value is given in 100 millisecond increments. The valid range for 'x' is 0..10 which translates into a time delay of 0..1 seconds in 100 millisecond increments.

The default is 0.

**EXTENT=x** This parameter sets the spare diagnostic extent in MiB. The diagnostic extent determines how much data can be tested before the test must sleep. This parameter slows down the test operations so they will not affect

the performance of the system. Increasing the EXTENT will allow more data to be tested in a single pass. Any changes applied to extent will affect tests in progress as well as future testing. The valid range for 'x' is 1..32 MiB.

Default is 8 MiB.

**INFO[=tc]** This parameter displays the information and status about a specific spare in the system. The disk is specified by its physical tier and channel locations, 'tc', where: 't' indicates the tier in the range <1..128>, and 'c' indicates the channel in the range <ABCDEFGHPS>.

**PATTERN=x** This parameter sets the system spare diagnostics pattern. The test pattern determines the pattern written to the disks during the test. The system supports the following patterns:

- **UNIQUE** - includes unique information including timestamp
- **AA** - A pattern of 0xAA is written to each byte
- **55** - A pattern of 0x55 is written to each byte
- **FF** - A pattern of 0xFF is written to each byte
- **00** - A pattern of 0x00 is written to each byte
- **COUNTUP** - A pattern of counting up is written to each byte
- **COUNTDOWN** - A pattern of counting down is written to each byte

The default is **UNIQUE**.

---

**Note:** Tests in progress are not affected by this parameter setting. Changing the pattern only applies to tests started after the parameter was modified.

---

**PAUSE** This parameter will pause any ongoing diagnostic operation only on the unit from which the command is run. If a test is being run from the other unit in a dual, the pause command will NOT affect that test.

**RESUME** This parameter will release any paused diagnostic operations and allow them to continue only on the unit from which the command is run. If a test has been paused on the other unit in a dual, the RESUME command will NOT affect that test.

**START** This parameter will start the spare diagnostics task if it is not running. Note that this will start diagnostics on both units in a dual as this is a system parameter.

**STOP** This parameter will abort any ongoing diagnostic operations. Note that this command will stop them and then the task will be idle until the RESTART command is executed. Note that this will stop diagnostics on both units in a dual as this is a system parameter.

## 3.41 STATS

**STATS** Displays the system performance statistics.

This command will display the performance statistics for the host ports, disk channels, and the cache memory. The command will show the read and write performance of each of the host ports. Read hits shows the percentage of read I/O requests where the data was already in the cache. Prefetch hits shows the percentage of read I/O requests where the data was already in the cache because of prefetching. Prefetches shows the percentage of host read I/O requests to the disks which are due to prefetching. The bottom of the screen shows the read and write performance of the disks. Disk pieces shows the total number of disk I/O requests from the host ports. BDB pieces is the number of host I/O blocking deblocking requests. Cache writeback data shows the percentage of the cache which contains writeback data which must be written to the disks. Cache rebuild data shows the percentage of the cache in use for rebuild operations, and Cache data locked shows the percentage of the cache which is locked by the locked LUNs.

**CLEAR** This parameter resets all the statistics back to zero.

**DELAY** This parameter displays a histogram of the time it takes for the host and disk I/O requests to complete. The disk queue delay includes the time the disk commands were queued up waiting to be sent to the disks.

**DISKPIECES** This parameter displays a histogram of the number of transfer pieces per disk command by disk command type. The system will combine several host I/O requests into a single disk I/O request. This histogram shows how often this is occurring.

**DISKIDISK=[tlcltc] [CLEAR]** This parameter displays a histogram of which disks in the system have taken an unusually long time to complete an I/O request. The count is incremented for a disk if the disk took longer than the other disks to finish an I/O request. This command is used to determine if a disk in the array is slowing down the system performance. Normally all the disks in a tier should have similar counts. A disk with a significantly higher count indicates that the disk may be slower or it may have problems. Optionally a specific tier ('t'), channel ('c') or drive ('tc') can be used to narrow the scope. The optional CLEAR can be used to clear (instead of displaying) these statistics on a drive, channel, tier or whole system basis.

**DUAL** This parameter displays the statistics for the dual mode messages.

**HOSTDELAY** This parameter displays a histogram of the time delay between when a data transfer is set ready and the host interface completes the transfer.

**INTERVAL=x** This parameter determines how many seconds the system will wait before displaying the repeating statistics information. This parameter is not saved. The valid range for 'x' is 1 to 60 seconds.

Default is 2 seconds.

**LENGTH** This parameter displays a histogram of the length of the host I/O requests in 16 KiB intervals.

**OFFSET** This parameter displays a histogram of the offset of the host I/O requests into the cache segments. Host I/O requests with offsets that are not in the 0x0 column may require blocking/deblocking which can slow down the performance of the system.

**REPEAT=MAIN|MBS|IOS|OFF** Allows the user to enable/disable the repeating statistics display, where:

- MAIN - display the normal STATS display.
- MBS - displays MiB/s.
- IOS - displays IO/s.
- OFF - turns off the repeating displays.

**SAMPLES=x** This parameter allows the user to specify how many times the repeating statistics display should repeat before turning off. Setting this value to a non-zero value will automatically enable the repeating statistics. The valid range for 'x' is 0 to 65535 samples. Default is 0.

**TIERDELAY|TIERDELAY=[tlcltc] [CLEAR]** This parameter displays a histogram of the time it takes for the disk I/O requests to complete for all the disks in the specified tier, 't', or specified channel, 'c', or specified drive, 'tc'. If nothing is specified, then all valid tiers will be displayed.

The CLEAR option will allow for selective clearing of these statistics. The optional CLEAR will allow for selective clearing (instead of displaying) of these statistics.

**TIERLENGTH|TIERLENGTH=n** This parameter displays a histogram of the length of the disk I/O requests for each tier in 8 KiB intervals.

## 3.42 TELNET

TELNET Display/Change the enabling/disabling of remote Telnet sessions.

Allows the user to display/change whether remote Telnet sessions are currently (temporarily) ENABLEd or DISABLEd. Note that this command only provides control over Telnet sessions during the current power cycle. To 'permanently' disable or enable Telnet sessions (i.e. across power-cycles), the user is referred to the NETWORK [TELNET=ON|OFF] command. Note that the default setting for this command at power-on is ENABLEd. The administrator is strongly advised to perform any commands affecting the system's configuration from the CLI UART only (and not from a Telnet session), and to only perform such commands after issuing the DISABLE command, so that remote users cannot log in to the system in the middle of an administrative command.

**CLEARSTATS** Clears the collected statistics on Telnet sessions.

**DISABLE** Allows the user to (temporarily) disable the establishment of remote Telnet sessions during the current power cycle. Users at remote locations will be unable to start a new Telnet session until after a corresponding TELNET ENABLE command is issued. To disable the Telnet functionality completely and maintain that setting through a power-cycle, refer to the NETWORK TELNET=ON/OFF command.

**ENABLE** Allows the user to (re-)enable the establishment of remote Telnet sessions during the current power cycle. Note that basic Telnet functionality for the system must already have been enabled with the NETWORK TELNET=ON/OFF command for this parameter to have any effect.

**KILLPARTNER[=m] [DISABLE]** Allows the user to cancel the currently active Telnet session on the other unit in a dual configuration, where 'm' specifies the number of minutes to pause after notifying the remote user of the impending termination before actually cancelling the session, and DISABLE, if present, indicates that the creation of future telnet sessions should be disabled after the current session is terminated. Sessions can be re-enabled with the TELNET ENABLE command. Valid values for 'm' fall in the range: 0..15. An attempt is made to prompt the remote user to first complete any active CLI command, and then to logout of the telnet session. However, the remote session will be automatically cancelled within 'm' minutes if there is no response; 'm' defaults to 1 if left unspecified. If 'm' is 0, the remote user is notified, but the session is cancelled immediately without waiting for any response from the remote user. Note that if the remote session is KILLED while a CLI command is in progress, the rest of the command's interaction will be transferred back to the unit's serial CLI interface.

**STATS** Displays the collected statistics on Telnet sessions.

## 3.43 TFTP

TFTP Performs an update of the firmware on the system using TFTP.

This command is used to update the firmware of the unit using TFTP. The system will download the new firmware image and save it in flash. The unit will need to be restarted before the new firmware can be used.

**<IP\_address> <Filename> <RESTART>** Supplies the TFTP server the IP Address from which to transfer a copy of the filename containing the desired software upgrade. Note that the user is prompted for this information if it is not explicitly given.

<IP\_address> is a string in the form: aaa.bbb.ccc.ddd,

<Filename> is a string value.

If RESTART is entered with all the other parameters after a successful TFTP download, the unit will restart without prompting for any information.

## 3.44 TIER

TIER Displays information about the tiers in the system.



This command displays the current status and configuration of the tiers in the system. Tiers are automatically added to the system when the disks are detected. Tier ownership is determined when the first LUN is added to a tier, and is unassigned when the last LUN resident on a tier is removed. A tier will be automatically uninstalled if it is both not in use by any of the LUNs and if all of the disks in the tier are removed or moved to another location.

The status of the disks in each tier is shown as follows:

A single character in the range ABCDEFGHPS indicates a healthy status for the disk on the channel corresponding to that letter, where:

- 'S' indicates the spare channel,
- 'P' indicates the parity channel, and all remaining characters indicate data channels.
- An 'e' indicates the disk is served by an enclosure.
- A '.' indicates that the disk was failed by the system.
- An 'r' indicates that the disk was failed by the system and replaced by a spare disk.
- A '!' indicates that the disk is in the wrong location.
- A '?' indicates that the disk has failed the diagnostics tests.
- A '\*' indicates that the disk is an enclosure device.
- A ' ' indicates that the disk is not installed.

The speed of the rebuild and format operations can be adjusted with the DELAY and EXTENT parameters.

**8+1=t|ALL** This parameter converts a tier into 8+1 mode. If the tier is currently an 8+2 Tier then the following applies: If any LUNs exist on the tier then the system will need to fail the P channel. The disks on the P channel will need to be rebuilt. The tier will not be converted if any other disks on the tier are failed. If the tier is currently a SPARE Tier then the following applies: The tier will not be converted if any of the channel spares are currently replacing a failed disk on another tier. Specify the tier to convert with 't' or use 'ALL' to convert all the tiers in the system. The 'ALL' parameter will also changed the default setting of missing tiers to be 8+1.

Tiers are 8+2 mode by default.

**8+2=t|ALL** This parameter converts a tier into 8+2 mode. If the tier is currently an 8+1 Tier then the following applies: If any LUN exists on the tier then the system will need to fail the P and S channels. The disks on the P and S channels will need to be rebuilt. The tier will not be converted if any other disks on the tier are failed. The tier will not be converted if any disks are replaced by a spare or the spare disk is currently replacing a failed disk on another tier. If the tier is currently a SPARE Tier then the following applies: The tier will not be converted if any of the channel spares are currently replacing a failed disk on another tier. Specify the tier to convert with 't' or use 'ALL' to convert all the tiers in the system. The 'ALL' parameter will also change the default setting of missing tiers to be 8+2.

Tiers are 8+2 mode by default.

**AUTOREBUILD=ON|OFF** This parameter enables and disables the automatic disk rebuilding when a failed disk is removed and replaced with a new disk or a failed disk that has not been replaced has returned and can be rebuilt quickly using the rebuild journal. This parameter also enables and disables the automatic replacement of failed disks with spare disks.

Default is ON.

**AUTORESTART=ON|OFF** This parameter enables and disables the automatic disk restart when a failed disk due to I/O timeout.

Default is OFF.

**CHANGEMAP** This parameter changes the current tier mapping for the disks in the array. This changes the position of the tiers in the system to conform with the layout of different disk modules. This parameter should only be used when the system is first configured.

**CONFIG** Displays the detailed disk configuration information for all of the tiers. See the general TIER command help description for an explanation of the 'Owner' and 'Disk Status' fields. 'Total LUNs' indicates the number of LUNs which currently reside on the tier. Note that the health indication for the spare channel under the 'Healthy Disks' heading is an indication of the health of the spare disk (if any) which is currently being used to replace a disk on the listed tier; the health indication for the spare channel that is physically on the listed tier is found under the 'Sp H' heading. 'F' indicates the failed disk (if any) on the tier. 'R' indicates the replaced disk (if any) on the tier. 'Sp H' indicates if the spare disk that is physically on the tier is healthy. 'Sp A' indicates if the spare disk that is physically on the tier is available for use as a replacement. 'Spare Owner' indicates the current owner of the physical spare, where ownership is assigned when the spare is used as a replacement. Note that 'RES-#' will appear under this heading while a replacement operation is underway to indicate that unit '#' currently has the spare reserved. 'Spare Used on' indicates the tier (if any) on which this physical spare is being used as a replacement. 'Repl Spare from' indicates the tier (if any) whose spare disk is being used as a replacement on this tier.

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**Note:** Note that this command will not display the detailed information about channel spares.

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**CONFIG=ALL** Displays the detailed disk configuration information for all of the tiers. This command is a combination display of both the CONFIG command and the CONFIG=SPARE command to provide a detailed picture of the entire system configuration.

**CONFIG=SPARE** Displays the detailed disk configuration information for channel spares only. 'Sp H' indicates if the spare disk that is physically on the tier is healthy. 'Sp A' indicates if the spare disk that is physically on the tier is available for use as a replacement. 'Spare Owner' indicates the current owner of the physical spare, where ownership is assigned when the spare is used as a replacement. Note that 'RES-#' will appear under this heading while a replacement operation is underway to indicate that unit '#' currently has the spare reserved. 'Spare Replaces' indicates the disk (if any) for which this spare is being used as a replacement.

**DELAY=x** This parameter sets the system rebuild delay. The rebuild delay determines how long a rebuild or format operation will pause after it reaches the rebuild extent. This parameter slows down the rebuild and format operations so they will not affect the performance of the system. This system rebuild delay value is given in 100 millisecond increments. The valid range for 'x' is 0..1000.

The default is 30.

**DELAYIOLIMIT=x** This parameter indicates how many host IO requests the system will allow per second before the system begins automatically slowing down the maintenance operations. The valid range for 'x' is 0..1000.

The default is 0.

**EXTENT=x** This parameter sets the system rebuild extent in MiB. The rebuild extent determines how much data can be rebuilt before the rebuild and format operations must pause. This parameter slows down the rebuild and format operations so they will not affect the performance of the system. Increasing the EXTENT will allow more data to be rebuilt in a single pass. The valid range for 'x' is 1..128 MiB.

Default is 32 MiB.

**JOURNAL** Displays information about the rebuild journal for each tier in the system. If a tier is specified then detailed information about the tiers journal will be displayed. The rebuild journals contain bitmaps which indicate which portions of the disks in a tier have been updated with new data while a disk was failed or replaced. The system uses the information in the journals to reduce the rebuild time of a drives that have not been swapped out. This can dramatically lower rebuild time since only portions of the tier may have been updated while the drive was failed or replaced. The granularity of the journal will be 8MiB of data on a single disk or 64MiB of host data. Thus a single host write will force the system to rebuild a minimum of 8MiB of data on the disk.

A new host write into a 8MiB section that has already been journaled will not cause a new journal entry. The system will automatically update journals when disks are failed or replaced regardless of whether journaling is enabled. To ensure that the journals are correct the system carefully monitors the state of the journals and will automatically invalidate or disable the journals if it detects a condition where the journal cannot be used or journal information could potentially be lost.

The following summarizes the limitations that apply to journaling:

Rebuild journaling will automatically be disabled if the failed disk is swapped with a new disk. The system will track the serial number of the disks when they are failed and will force a rebuild of the entire disk if the serial number changes.

Rebuild journaling will not be used when a failed disk is replaced by a spare. The rebuild journal can be used when rebuilding a replaced disk that has not been swapped.

The system will invalidate the journal on tiers that have failed or replaced disks on boot up. This is required because the system does not save the journal information.

Rebuild journaling will be managed by the controller that owns the tier. If a controller is failed, then the journals on the tiers owned by that controller will be invalidated.

The system tracks the original owner of a tier when a drive is failed so changing the ownership of the tier will disable use of the journal for rebuilds on that tier.

Rebuild journaling will be disabled when rebuilding disks that are failed due to a change in the parity mode of the tier.

Use of the rebuild journal will be temporarily disabled if the system is rebuilding a LUN that is a backup LUN in a mirror group.

The status field indicates the current status of the journal. Ready - The journal is waiting for updates. Active - A disk is failed and the journal has updates. All other statuses indicate why the journal cannot be used.

The Rebuild OK field indicates if a rebuild can use the journal.

- Off - Journaling not enabled. Use JOURNAL=ON to enable.
- Yes - Journaling can be used when rebuilding.
- No - Journaling cannot be used.

The rebuilds will only use the journals if the 'Rebuild OK' field indicates 'Yes'. In order to use journaling on rebuilds, the operation must be manually started using DISK REBUILD=tc where 't' indicates the tier, and 'c' indicates the channel or REBUILD=ALL which will start a rebuild on all disks.

**JOURNAL=ON|OFF** This parameter enables and disables use of the journals during rebuild operations. The system will automatically update the journals when disks are failed or replaced regardless of this setting. This parameter only indicates if the journal can be used during the rebuild.

Default is ON.

**JOURNAL=t** Displays information about the rebuild journal for the specified tier. This screen will give detailed information about the status of the journal and a display of all the journal entries for the tier. This screen will also give more detailed information on the status of the journal and will indicate why it was disabled or invalidated

**MAP** This parameter shows the current tier mapping mode for the disks in the array.

**MAXREBUILDS=x** This parameter sets the maximum number of active rebuilds for each controller in the system. Additional rebuilds will be queued up. The valid range for 'x' is 1..16.

Default is 4.

**MAXVERIFIES=*x*** This parameter sets the maximum number of concurrent tier verifies on a system. The range is 1 to 16. The default value is 2.

**PAUSE[=*t*]** This parameter will pause any ongoing rebuild operations. A single tier can be specified by '*t*'. Note that rebuild operations can be started either automatically (see the AUTOREBUILD option), or with the DISK REBUILD command.

**QSHOW** Display the rebuild queue in a debug format and in order of request.

**RESUME[=*t*]** This parameter will release any paused rebuild operations. A single tier can be specified by '*t*'. Note that rebuild operations can be started either automatically (see the AUTOREBUILD option), or with the DISK REBUILD command.

**SMARTREPLACE=ON|OFF** This parameter enables and disables the automatic proactive replacement of disks that indicate a SMART event has triggered. A disk will only be replaced by a spare disk if it indicates that SMART has tripped, AUTOREBUILD is ON, and SMARTREPLACE is on.

Default is OFF.

**SPARE=*t*** This parameter converts a tier into a SPARE Tier to be used for Channel Sparring. If any LUN exist on the tier then the system will not allow the conversion. The tier will not be converted if the spare disk is currently replacing a failed disk on an 8+1 tier. Specify the tier to convert with '*t*'.

Tiers are 8+2 mode by default.

**STANDBY[=*t*]** This parameter displays the current STANDBY status for all tiers owned by the unit. A single tier can be specified by '*t*'. This parameter is only valid for SATA tiers. The valid range for '*t*' is <3..128>.

**STANDBY\_DISABLE=[*t*|ALL]** This parameter disables STANDBY mode for the specified tier(s). A single tier can be specified by '*t*' as long as it is not owned by the other unit. The valid range for '*t*' is <3..128>. If ALL tiers are specified, then all tiers owned by the unit will be disabled for STANDBY mode.

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**Note:** This parameter is only valid for SATA tiers.

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**STANDBY\_ENABLE=[*t*|ALL]** This parameter enables STANDBY mode for the specified tier(s). A single tier can be specified by '*t*' as long as it is not owned by the other unit. The valid range for '*t*' is <3..128>. If ALL tiers are specified, then all tiers owned by the unit will be enabled for STANDBY mode with the current standby timeout value.

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**Note:** This parameter is only valid for SATA tiers.

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**STANDBY\_MAX\_TIERS[=*x*]** This parameter sets the maximum number of tiers that may be taken out of STANDBY mode at once, to avoid over-stressing the enclosure power supplies. This parameter is only valid for SATA tiers. The valid range for '*x*' is 1..120.

Default is 8.

**STANDBY\_TIMEOUT[=*x*]** This parameter sets the standby timeout value for all disks (in minutes). It defines the period that a disk must receive no I/O commands before entering STANDBY mode (if enabled for the tier in which the disk resides). This parameter can only be changed if STANDBY mode is disabled for all tiers. This parameter is only valid for SATA tiers. The valid range for '*x*' is 30..330.

Default is 30.

**STOP[=*t*]** This parameter will abort any active rebuild operations. A single tier can be specified by '*t*'. Note that rebuild operations can be started either automatically (see the AUTOREBUILD option), or with the DISK REBUILD command.

**VERIFY** Displays the verify information by tier settings for all valid tiers in the system.

**VERIFY=ON|OFF** Prompts the user for a list of TIERS on which background verify by tier will be turned either ON or OFF. The 'VERIFY=ON' argument will turn on background verify for the specified tier(s), optionally running in continuous mode. A 'VERIFY=OFF' command, however, only turns off the Background Verify setting for the specified tier(s). Therefore, any verifies already active on the tier(s) will not terminate until after the completion of that verify's current iteration. To stop all Verify operations immediately, use 'TIER STOP'.

**VERIFY=x** Turns ON background verify for TIER 'x', where 'x' is in the range 0..128.

**VERIFYPCLEAR[=x|ALL]** This parameter allows the user to clear the verify count and the time of last verify for a specific tier designated by 'x' or all tiers.

## 3.45 TIME

**TIME** Displays/Changes the current system time.

Displays/Changes the current system time.

**GETTIME** Instructs the system to get the time from the default SNTP time server. The default SNTP time server address can be changed with the command **TIME SNTPIP=aaa.bbb.ccc.ddd**

**GETTIME=aaa.bbb.ccc.ddd** This command instructs the system to get the time from the SNTP time server specified. This command will not update the SNTP address the system uses for periodic polling. The SNTP address the system uses for polling can be changed with the command **TIME SNTPIP=aaa.bbb.ccc.ddd**

**SNTPIP=aaa.bbb.ccc.ddd** Specifies an IP address of a SNTP time server for the system to poll.

**TIMEZONE** Sets the timezone-specific information for the system by prompting the user. The following fields will be requested interactively from the user: <name> : is for display only. It can be 3 characters, maximum, with no embedded whitespace. <UTC\_offset> : is the offset in hours and minutes from Coordinated Universal Time (i.e. Greenwich Mean Time). Timezone offsets are represented as:

- '+/-HH.MM'

where:

- HH: indicates the hours of the offset. The valid range is: 0..+/-12.
- MM: indicates the minutes of the offset. The valid range is: 00..59. <DST\_start> : indicates the start time for Daylight Savings. <DST\_end> : indicates the end time for Daylight Savings. Both the <DST\_start> and <DST\_end> times are given in the format: 'MMDDHH', where:
  - MM: indicates the month, in the range 1..12.
  - DD: indicates the day, in the range 1..31.
  - MM: indicates the hour, in the range 0..23.

The user can verify the designated DST functionality, as follows:

1. Ensure that SNTP updating is disabled, via the CLI command: 'NETWORK SNTP=OFF'.
2. Set the <DST end time> to a particular day at, e.g. 1:00am.
3. Using the CLI DATE and TIME commands, set the system's current date and time to 23:55pm of the day before DST expiration.
4. As the 1:00am. time is passed an hour later, the time will be automatically adjusted appropriately. Also, if the DST start date is set and is in effect, the effective offset will be adjusted by 1 hour.

The TIMEZONE parameter is flexible enough to support any time zone in the world. However in order to support daylight saving time (DST) the administrator will need to update the time zone information each year because the start and end times change each year.

**TIMEZONEDISABLE** Clears the timezone.

**hh:mm:ss** Allows the user to change the system time to the new value indicated by 'hh:mm:ss', where:

- hh: indicates the hour in the range 0..23.
- mm: indicates the minute in the range 0..59.
- ss: indicates the second in the range 0..59.

#### **Examples**

To simply display the system time: `TIME` To change the system time to noon: `TIME 12:00:00`

## **3.46 UPTIME**

**UPTIME** Displays the system's Uptime.

Displays the system's Uptime value (also known as Power on Hours) which is the total time the system has been operational since release from the factory. The Uptime value is displayed as YY:DDD:HH:MM where:

- YY = Number of years,
- DDD = Number of days,
- HH = Number of hours, and
- MM = Number of minutes.

This command also displays the system's uptime value since restart which is the total time the system has been operational since the system was powered up. The Uptime 'Since Restart' value is displayed as DDD:HH:MM:SS where:

- DDD = Number of days,
- HH = Number of hours, and
- MM = Number of minutes
- SS = Number of seconds.

## **3.47 USER**

**USER** Displays/Changes the host and anonymous users' information.

This command is used to display/change the system security settings for all the host users accessing the system by specifying their LUN and port mappings:

The LUN mapping indicates which internal LUNs the user will have access to and where the internal LUN will appear to the user (i.e. as its external LUN).

The Port mapping indicates those ports through which the user may gain access to the unit.

The host users are identified by their 64-bit World Wide Name. The system can store the configuration of up to 512 host users. Any user accessing the system without a World Wide Name entry in the configuration table will be considered anonymous and will be granted the default LUN zoning for the host port they are connected to. The default LUN zoning for each host port can be changed with the ZONING command. Known host users may be assigned either

their own unique LUN mapping, or the default LUN zoning for the host port they are connected to. A listing of the system's internal LUNs can be displayed with the LUN command.

**ADD** This parameter adds and configures a new host user for the system. Users who are currently logged in anonymously may be specified simply by their current ID value; otherwise a World Wide Name value is required to identify the new host user.

**AUDIT[=ON|OFF]** This parameter enables and disables the host user auditing, if ON or OFF is specified, respectively. Otherwise, it will display the current host user auditing setting. When auditing is turned ON, the system will display a message whenever a host user logs into or out of the system. Anonymous users are included.

Default is OFF.

**CONNECTIONS** This parameter displays all the current host and anonymous user connections. Note that only LUNs which currently exist in the system are displayed in the LUN Zoning/Mapping list for each user.

**DEL|DELETE[=x]** This parameter deletes an existing host user, 'x', from the system. If no host user is specified, the user is prompted for one.

**DLM[=x|ALL]** This parameter displays the direct LUN mapping information for the host user(s) designated by 'x', or ALL. 'x' will display the LUN mapping information for a single host user; ALL will display the LUN mapping information for all host users with DLM enabled. If no host user is specified, the user will be prompted for one. Note that all LUNs that are mapped for the user(s) are displayed, regardless of whether or not the LUNs currently exist in the system.

**DLM\_DISABLE[=x|ALL]** This parameter disables the direct LUN mapping for the host user(s) designated by 'x', or ALL. 'x' will disable the direct LUN mapping for a single host user; ALL will disable the direct LUN mapping for all host users. If no host user is specified, the user will be prompted for one. Note that users can be disabled for DLM, regardless of whether or not the users currently exist in the system.

**DLM\_ENABLE[=x|ALL]** This parameter enables the direct LUN mapping for the host user(s) designated by 'x', or ALL. 'x' will enable the direct LUN mapping for a single host user; ALL will enable the direct LUN mapping for all host users. If no host user is specified, the user will be prompted for one. Note that users can be enabled for DLM, regardless of whether or not the users currently exist in the system.

**DLM\_LUN\_DISABLE[=ALL]** This parameter disables the direct LUN mapping for specified LUNs for the specified host user; ALL will disable the direct LUN mapping for all LUNs for all users where DLM is enabled.. If ALL is not specified, the user will be prompted for LUNs. Note that LUNs can be disabled for DLM, regardless of whether or not the LUNs currently exist in the system.

**DLM\_LUN\_ENABLE[=ALL]** This parameter enables the direct LUN mapping for specified LUNs for the specified host user; ALL will enable the direct LUN mapping for all LUNs for all users where DLM is enabled. If ALL is not specified, the user will be prompted for LUNs. Note that LUNs can be enabled for DLM, regardless of whether or not the LUNs currently exist in the system. DLM must be enabled via the DLM\_ENABLE command before LUNs can be enabled.

**EDIT[=x]** This parameter edits the LUN mapping for an existing host user, 'x'. If no host user is specified, the user will be prompted for one.

**SHOWMAP[=x|ALL]** This parameter displays the detailed user LUN mapping information for the host user(s) designated by 'x', or ALL. 'x' will display the LUN mapping information for a single host user; ALL will display the LUN mapping information for all host users. If no host user is specified, the user will be prompted for one. Note that all LUNs that are mapped for the user(s) are displayed, regardless of whether or not the LUNs currently exist in the system.

## 3.48 VERSION

VERSION Displays the firmware version of the system.

This command displays information about the current version of the system hardware and firmware.

**RCM\_API** Displays the revision of the RCM API that is currently supported by the system firmware. The RCM API revision number refers to the pertinent revision of the API Interface document.

## 3.49 WHOAMI

WHOAMI Displays the owner of the current CLI or Telnet session.

Displays the owner of the current CLI or Telnet session.

## 3.50 ZONING

ZONING Displays and changes the default host port LUN zoning.

This command is used to change the default LUN zoning for the anonymous users on each host port. LUN zoning indicates which internal LUNs the user will have access to and where the internal LUN will appear to the user. The users are identified by their 64-bit World Wide Name. The system can store the configuration of up to 512 users. Any user accessing the system without having a World Wide Name entry in the configuration table will be considered anonymous and will only be granted the default LUN zoning for the host port they are connected to. Note that users can be added to and configured for the system using the USER command.

**DEFAULT[=x|ALL]** This parameter is used to restore the zoning on a host port to the default settings. If no host port is specified, the user will be prompted for one.

**DLM[=x|ALL]** This parameter displays the direct LUN mapping information for the host port(s) designated by 'x', or ALL. 'x' will display the LUN mapping information for a single host port; ALL will display the LUN mapping information for all host ports with DLM enabled. If no host port is specified, the user will be prompted for one. Note that all LUNs that are mapped for the port(s) are displayed, regardless of whether or not the LUNs currently exist in the system.

**DLM\_DISABLE[=x|ALL]** This parameter disables the direct LUN mapping for the host port(s) designated by 'x', or ALL. 'x' will disable the direct LUN mapping for a single host port; ALL will disable the direct LUN mapping for all host ports. If no host port is specified, the user will be prompted for one.

**DLM\_ENABLE[=x|ALL]** This parameter enables the direct LUN mapping for the host port(s) designated by 'x', or ALL. 'x' will enable the direct LUN mapping for a single host port; ALL will enable the direct LUN mapping for all host ports. If no host port is specified, the user will be prompted for one.

**DLM\_LUN\_DISABLE[=ALL]** This parameter disables the direct LUN mapping for specified LUNs for the specified host port; ALL will disable the direct LUN mapping for all LUNs for the specified host port. If ALL is not specified, the user will be prompted for LUNs. Note that LUNs can be disabled for DLM, regardless of whether or not the LUNs currently exist in the system.

**DLM\_LUN\_ENABLE[=ALL]** This parameter enables the direct LUN mapping for specified LUNs for the specified host port; ALL will enable the direct LUN mapping for all LUNs for the specified host port. If ALL is not specified, the user will be prompted for LUNs. Note that LUNs can be enabled for DLM, regardless of whether or not the LUNs currently exist in the system. DLM must be enabled via the DLM\_ENABLE command before LUNs can be enabled.

**EDIT[=x]** This parameter is used to edit the default LUN zoning on each host port. If no host port is specified, the user will be prompted for one.