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# User Guide

# CLI

Command Line Interface  
for Linux

For use on 7000 and 8000 Series  
Escalade™ ATA RAID Controllers

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# Introduction

The Command Line Interface (CLI) for Linux is provided to manage 7000 and 8000 series 3ware Escalade™ ATA RAID controllers. Multiple systems containing Escalade controllers may be managed using the CLI via a command line or script. CLI is useful in environments where a graphical user interface (GUI) is not available.

# Features

The 3ware CLI provides the basic functionality of the 3ware Disk Management (3DM®) utility through a Command Line Interface. You can view array status and version information, and perform maintenance functions like adding or removing drives. CLI also includes advanced features for reconfiguring RAID arrays online.



**Note:** Refer to the *Escalade ATA RAID Controller User's Guide* for complete information on 3DM and for configuring or upgrading your computer.

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The CLI command set is listed below and described in detail in the *Command Line Interface* chapter of this guide:

- info - to view basic controller information
- alarms - to display a list of AENs for all controllers
- set - to display and modify current settings
- maint - to perform drive and RAID array maintenance operations for a single controller
- help - to display a list of commands and options

# Installation

You will need to be root or have root privileges to install the CLI to /usr/sbin and to run the CLI.

```
Filename: tw_cli.tar
```

To install the CLI, type the following as root:

```
tar xf tw_cli.tar -C /usr/sbin
```

To install the CLI to a different location, change /usr/sbin/ to the desired location.



**Note:** The installation location needs to be in the environment path for root to execute the CLI without using complete paths (i.e., if installed to /usr/sbin/, you can type tw\_cli on the command line, otherwise you will have to type the complete path: /home/user/tw\_cli).

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## Warning!

For all of the functions of the CLI to work properly, you must have the proper CLI, firmware, and driver versions installed. Check [www.3ware.com](http://www.3ware.com) for the latest versions and upgrade instructions. If the proper firmware and driver versions are not installed CLI will not report the controller when issuing the info command.

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# Command Line Interface



**Note:** In this chapter, text surrounded by [] brackets indicates optional parameters.

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## Ways to Run the CLI

### 1) Interactive with command interface

`tw_cli`

**Description:**

Execute `tw_cli` to get into a console where you can interactively enter commands to get, set or maintain your Escalade.

**Example:**

```
tw_cli
3ware CLI>
```

The main prompt is displayed when the program is awaiting a command.

```
3ware CLI>
```

### 2) Single command with output

`tw_cli <command line arguments>`

CLI run command

**Description:**

This command doesn't invoke the main CLI prompt if used with command line arguments.

**Syntax:**

```
tw_cli <command line arguments>
```

**Example:**

```
tw_cli info c0 u0
```

### 3) Multiple commands through an input file

**tw\_cli -f <filename>**

CLI run command

**Description:**

This method executes a specific filename, where the filename is the name of a text file containing a list of CLI commands which the user types in advance. Each command should be on a separate line.

**Syntax:**

```
tw_cli -f <filename>
```

**Example:**

```
tw_cli -f clicommand.txt
```



**Note:** All examples given in the following sections will reflect the interactive mode method.

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## Controller Information

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**Note:** Commands will be displayed in italics for easy identification.

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### The *info* command

The *info* command provides information about the 3ware Escalade controller, the attached drives, and configured RAID arrays or units. This command is for querying purposes only. To make modifications use the *set* command to change the settings and the *maint* command to maintain the RAID arrays.



Specific options for the *info* command:

- Controller information options
  - *model* - provides the controller model number
  - *firmware* - provides the controller firmware version
  - *bios* - provides the controller bios version
  - *monitor* - provides the controller monitor version
  - *driver* - provides the controller driver version.
  - *serial* - provides the controller serial number
  - *pcb* - provides the controller revision number
  - *achip* - provides the controller achip version
  - *pchip* - provides the controller pchip version
  - *numunits* - provides the number of units on the controller
  - *numports* - provides the number of ports on the controller
  - *numdrives* - provides the number of drives on the controller
  - *allunitstatus* - provides simple numeric status for all units
  - *drivestatus* - provides the status of drives on the controller
- Unit information options
  - *status* - provides the status of a specific unit
  - *rebuildstatus* - provides percent complete of rebuild
  - *verifystatus* - provides percent complete of verify
  - *initializestatus* - provide percent complete of initialization.
- Port (drive) information options
  - *status* - provides the status of a drive on the controller
  - *model* - provides the drive manufacturer model number
  - *serial* - provides the drive serial number
  - *capacity* - provides drive capacity
  - *smart* - provides SMART data in hex format for troubleshooting a drive

**Syntax:**

```
info [c<c>[u<u>|p<p>]][item]]
```



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**Note:** •

- If *c* is not specified, information for all controllers is displayed, including a brief description of each.
  - If only *c* is specified, information about the *c*th controller is provided in detail.
  - If *c* is specified and *u* is also specified, information about the *u*th unit on the *c*th controller is provided in detail.
  - If *c* is specified and *u* is also specified with *status*, text and hex code of the status is displayed in the form OK (0xFF). Also, an error code is returned, bit masking bad drives if any of the drives used by the array are bad. For example, if port 2 is bad, the return code would be 4 (in hex).
  - If *c* is specified and *u* is also specified with *rebuildstatus*, then the status of the array is displayed (e.g., 0=array is not rebuilding, 1-99 = the percentage of the rebuild)
  - If *c* is specified and *p* is also specified, information about the *p*th port on the *c*th controller is displayed.
- 
- 

## Examples using Interactive Mode

### info

**Example:**

```
3ware CLI> info
```

**Sample of output:**

```
List of controllers
```

```
-----
```

```
Controller 1: Escalade 7000-2 (2 ports)
```

```
Controller 0: Escalade 7500-8 (8 ports)
```

**info** for specific controller**Example:**

```
3ware CLI> info c0
```

**Sample of output:**

```
Controller 0
```

```
-----
```

```
Model: 7500-8
```

```
FW: FE7X 1.05.00.034
```

```
BIOS: BE7X 1.08.00.038
```

```
Monitor: ME7X 1.01.00.035
```

```
Serial #: D415TGZE
```

```
PCB: Rev B
```

```
Achip: 3.2
```

```
Pchip: 1.3
```

```
# of units: 3
```

```
Unit 0: RAID 5 60.3 GB (117262592 blocks):  
REBUILDING (2%)
```

```
Unit 3: JBOD 20.48 GB (40000464 blocks): OK
```

```
Unit 4: RAID 1 81.96 GB (160084480 blocks)  
: VERIFYING (16%)
```

```
# of ports: 8
```

```
Port 0: MAXTOR 98196H8 V80EDX1C 81.96 GB  
(160086528 blocks): OK(unit 0)
```

```
Port 1: Maxtor 98196H8 V80539XC 81.96 GB  
(160086528 blocks): OK(unit 0)
```

```
Port 2: Maxtor 98196H8 V80539RC 81.96 GB  
(160086528 blocks): OK(unit 0)
```

```
Port 3: Maxtor 92048D8 W802SE1A 20.48 GB  
(40000464 blocks): OK (unit 3)
```

```
Port 4: Maxtor 98196H8 V80HRGRC 81.96 GB  
(160086528 blocks): OK (unit 4)
```

```
Port 5: Maxtor 98196H8 V80HRGFC 81.96 GB  
(160086528 blocks): OK (unit 4)
```

```
Port 6: DRIVE NOT PRESENT
```

```
Port 7: DRIVE NOT PRESENT
```

**info** for specific unit on a controller

**Example:**

```
3ware CLI> info c0 u0
```

**Sample of output:**

```
Controller 0, Unit 0
-----
Status: REBUILDING (54%)
Unit type: RAID 5
Size: 60.3 GB (117262592 blocks)
# of subunits: 3

Subunit 0: CBOD: OK
Physical Port: 0
Logical Port: 0

Subunit 1: CBOD: OK
Physical Port: 1
Logical Port: 1

Subunit 2: CBOD: OK
Physical Port: 2
Logical Port: 2
```

**info** for specific port (drive)

**Example:**

```
3ware CLI> info c0 p0
```

**Sample of output:**

```
Controller 0, Port 0
-----
Status: OK
Model: MAXTOR 98196H8
Size: 81.96 GB (160086528 blocks)
FW: ZAH814Y0
Serial #: V80EDX1C
Unit: 0
```

**info** for specific code versions on a specific controller (firmware, bios, monitor, model, driver)

**Example:**

```
3ware CLI> info c0 firmware
```

**Sample of output:**

```
FE7X 1.12.34.24
```

**info** for specific port (drive)

**Example:**

```
3ware CLI> info c0 p0 serial
```

**Sample of output:**

```
D415TGZE
```

**info** for SMART data on a specific drive

**Example:**

```
3ware CLI> info c0 p0 smart
```

**Sample of output:**

```
10 00 01 0A 00 FD FC A8 00 00 00 00 00 03 27
00 C8 C8 52 53 00 00 00 00 00 04 32 00 FD FD 63
00 00 00 00 00 00 05 33 00 FD FD 00 00 00 00
00 00 06 01 00 FD FD 00 00 00 00 00 00 07 0A
00 FD FC 00 00 00 00 00 00 00 08 27 00 FC EF 49
BC 00 00 00 00 00 09 32 00 F6 F6 F4 69 00 00
00 00 0A 2B 00 FD FC 00 00 00 00 00 00 0B 2B
```



**Note:** The SMART data is displayed in hex format.

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## **drivestatus**

### **Description:**

To get a general status of the drives of a controller.

### **Example:**

```
3ware CLI> info c0 drivestatus
```

#### **Sample of output:**

```
# of ports: 4
```

```
Port 0: Maxtor 98196H8 V8096CCC 81.96 GB (160086528  
blocks): OK (unit 0)
```

```
Port 1: DRIVE NOT PRESENT
```

```
Port 2: DRIVE NOT PRESENT
```

```
Port 3: Maxtor 98196H8 V805W6SC 81.96 GB (160086528  
blocks): OK (unit 0)
```

## **rebuildstatus**

### **Example:**

```
3ware CLI> info c0 u2 rebuildstatus
```

#### **Sample of output:**

```
60
```

## **Controller not found**

### **Example:**

```
3ware CLI> info c2
```

#### **Sample of output:**

```
Invalid controller id specified, no control-  
ler with id 2 exists.
```

## Settings

### The *set* command

The *set* command can be used to display and modify settings.

- *rebuild* - sets the rebuild rate (per controller basis)
- *cache* - enables or disables caching on a per array unit basis for RAID 1, 5, and 10 arrays.



#### Note:

A value of 1 indicates slowest I/O and fastest rebuild rate. A value of 5 indicates fastest I/O and slowest rebuild. Interim values scale linearly (e.g., a value of 3 indicates a rebuild rate half as fast as a rebuild of 1).

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#### Syntax:

```
set [
rebuild c<c> <1..5> |
cache c<c> u<u> [on|off]
]
```

### Examples using Interactive Mode

#### set

##### Description:

Using the *set* command without the *rebuild* or *cache* options displays the current configuration, as shown below:

##### Example:

```
3ware CLI> set
```

##### Sample of output:

```
Controller 1
```

```
=====
```

```
Rebuild Rate setting for Controller 1
```

```
-----  
1 (Fastest Rebuild)  
  
Cache Settings for Controller 1  
-----  
Unit 0: ON  
  
Controller 0  
=====
```

Rebuild Rate setting for Controller 0

```
-----  
1 (Fastest Rebuild)  
  
Cache Settings for Controller 0  
-----  
Unit 0: ON
```



**set cache enable****Example:**

```
3ware CLI> set cache c0 u0 on
```

**Sample of output:**

```
Turning the cache on for unit 0 on controller
0
```

**set cache disable****Example:**

```
3ware CLI> set cache c0 u0 off
```

**Sample of output:**

```
Turning the cache off for unit 0 on controller
0
```



**Note:** The Escalade ATA RAID Controller gives you a choice of disabling the write cache for your disk arrays. Write cache is used to store data locally on the drive before it is written to the disk, allowing the computer to continue with its next task. Enabling the write cache results in the most efficient access times for your computer system. There may be instances when you always want the computer to wait for the drive to write all the data to disk before going on to its next task. For this case, you must disable the write cache.

---



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**set rebuild****Description:**

To set the rebuild rate of controller 0 to 3 (the middle value).

**Example:**

```
3ware CLI> set rebuild c0 3
```

**Sample of output:**

```
Setting the rebuild rate of controller to 3  
(Balanced rebuild and I/O)
```



**Note:** Setting the rebuild rate of a controller allows the user to set the relative performance of normal IO and background tasks.

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## Array Maintenance

### The *maint* command

The *maint* command enables a user to perform maintenance operations on the controller, its units, and drives. It is recommended that you use the *info* command first to query the controller information prior to using the *maint* command. The array maintenance feature supports:

- *add* - adds a drive. The new drive can be specified as a hot spare, as a new JBOD after it is physically connected to the controller, or a CBOD, which is a configurable JBOD that can be used to rebuild a degraded array.
- *remove* - removes a drive from a port. After this is done, a drive can safely be removed from the controller.
- *createunit* - creates a unit.
- *deleteunit* - deletes a unit.
- *rebuild* - rebuilds a degraded array. Specify a unit number on a controller you want to rebuild, along with the port number of an available disk drive. Specifying the *ignoreECC* option continues the rebuild even if ECC errors are detected.
- *flush* - flushes cache on the controller(s).
- *verify* - verifies the redundancy of a RAID 1, RAID 10, or RAID 5 array.

**Warning!**

If you try to add a JBOD, you must add it to a port that was a JBOD prior to removal of the drive.

**Syntax:**

```
maint [
  add c<c> p<p> [jbod|cbod|spare] |
  remove c<c> p<p> |
  createunit c<c> r<raid<0|1|10|5>|<j|c>bod|spare>
    [k<stripe>] p<p:p..> [noscan] |
  deleteunit c<c> u<u> [noscan] |
  rebuild c<c> u<u> p<p> [ignoreECC] |
  flush c<c> [u<u>] |
  verify c<c> u<u> [stop]
]
```

**Table 1: Createunit RAID Types and Stripe Sizes**

	RAID Type	Stripe Size
Createunit allows the following to be specified	JBOD CBOD SPARE RAID10 RAID1 RAID5	For RAID1 and RAID10: 64k, 128k, 256k, 512, and 1024k.  For RAID5: 64k.



**Note:** Do not specify a stripe size for JBOD, CBOD, or a spare. For more information regarding RAID types, see the *Escalade User Guide* available at [www.3ware.com](http://www.3ware.com).

## Examples using Interactive Mode

### **maint add**

#### **Description:**

To add a disk drive that is at port 3 to controller 0.



#### **Warning!**

Adding a drive with the CLI, as with 3DM, requires an approved hot swap carrier. If you do not have a hot swap carrier you must power down your system before adding any new drives. Refer to the Escalade User Guide's Hardware Installation section for physically attaching new drives and using the Disk Array Configuration Utility. Attaching a new drive without a hot swap carrier can cause a system hang and data corruption. You may even damage the drive and computer system.

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### **Adding a RAW drive**

Newly added drives, which are not specified as a CBOD, JBOD, or a spare drive, will be added as a raw device with no unit number assigned. This drive can be used later as part of the `createunit` command or for rebuilding a degraded array. If you reboot your system before using the raw drive it will automatically become a CBOD unit. To add a raw drive with the CLI, physically add the drive using an approved hot swap carrier and issue the following command:

#### **Example:**

```
3ware CLI> tw_cli maint add c0 p2
```

#### **Sample of output:**

```
Successfully added a raw drive to port 2 on  
controller 0
```

## Adding a CBOD drive

A CBOD unit is a "configurable JBOD" that will be assigned a unit number when added. This number is usually the same as the port number unless the unit number is already in use as in the case of a degraded array. If this happens the new drive will be assigned the lowest available unit number.

This single CBOD unit can be used later for rebuilding a degraded array. To add a CBOD unit with the CLI, physically add the drive using an approved hot swap carrier and issue the following command:

Example:

```
3ware CLI> tw_cli maint add c0 p1 cbod
```

**Sample of output:**

```
Successfully added a CBOD to port 1 on controller 0
```

## Adding a JBOD drive

JBOD units are "just a bunch of disks" and used just like an individual drive. This type of RAID unit is assigned a unit number when added and must be added to the same port the JBOD unit was on before. JBODs can also be configured later as part of a software RAID array instead of configuring them as a 3ware hardware RAID array. To add a JBOD unit with the CLI, physically add the drive using an approved hot swap carrier and issue the following command.

Example:

```
3ware CLI> tw_cli maint add c0 p0 jbod
```

**Sample of output:**

```
Successfully added a JBOD to port 0 on controller 0
```

When adding a JBOD drive the physical drive cannot be from a previous 3ware array including a CBOD or a spare drive. To use a drive from a previous array as a JBOD, add the drive as a raw device instead of a JBOD and then use the `createunit` command to overwrite the old configuration.

### Adding a SPARE drive

A SPARE unit is a drive that is reserved to replace a failed drive in a redundant array. The degraded array is then automatically rebuilt. This type of RAID unit will be assigned a unit number when added. This number is usually the same as the port number unless the unit number is already in use as in the case of a degraded array. If this happens, the new drive will be assigned the lowest available unit number.

Hot spares should be created immediately after creating a RAID-1, RAID-10, or RAID-5 array. To specify a hot spare with the CLI, physically add the drive using an approved hot swap carrier and issue the following command:

Example:

```
3ware CLI> tw_cli maint add c0 p0 spare
```

**Sample of output:**

```
Successfully added a JBOD to port 0 on controller 0
```



#### **Alert!**

Hot spare drives must be equal to or larger than the drives used for the redundant array in order for the rebuild to begin.

---

---

**maint remove****Description:**

To remove a disk drive from port 3 of controller 0.



**Note:** Drives cannot be removed if they are part of a degraded or non-redundant array, with the exception of JBOD drives.

---

---

**Warning!**

You must first unmount a JBOD drive before issuing the remove command. Failure to do so may result in a system hang and data corruption.

---

---

**Example:**

```
3ware CLI> maint remove c0 p3
```

**Sample of output:**

```
Successfully removed drive from port 3 on controller 0
```

**maint createunit****Description:**

To create raid arrays. The following example illustrates the creation of a RAID 5 array with a 64k stripe size with drives on ports 0 through 7 on controller 0.



**Note:** Before creating a unit you must first use the add command for the controller to recognize each drive after they are physically connected. Ports that have a unit number already assigned cannot be used to create a new unit.

Units include RAID arrays as well as CBOD, JBOD, and spare drives. Use the info command to determine if a port already has a

unit number. Newly added drives, which are not specified as a CBOD, JBOD, or spare drive, will be added as a raw device with no unit number assigned. Only raw drives can be used to create a new unit. When deleting a unit, the drives also become raw devices, which can then be used to create a new unit.

---

---

**Example:**

```
3ware CLI> maint createunit c0 rraid5 k64
p0:1:2:3:4:5:6:7
```

**Sample of output:**

```
Created unit 0
```

## **maint createunit (with noscan option)**

**Description:**

When creating a unit with the "noscan" option the unit will not be exported or seen by the OS.

**Example:**

```
3ware CLI> maint createunit c0 rraid10 k1024
p0:1:2:3:4 noscan
```

**Sample of output:**

```
Created unit 0
```



**Note:** Since "noscan" option was specified, device sda is not available to the OS, as shown below:

```
linux:~ # fdisk /dev/sda
Unable to open /dev/sda
```

---

---





**Note:** If the device needs to be added at a later time there are two options: 1) Reboot system, at which time the OS will scan and add detected arrays, or 2) Issue the following command:

```
echo "scsi add-single-device 0 0 0 0 "
>/proc/scsi/scsi
```

---



---

SCSI # (3ware controller #)  
 Channel # (Always 0)  
 ID Unit #  
 Port # (Always 0)

```
Echo "scsi add-single-device 0 0 0 0">/proc/scsi/scsi
```

**Figure 1 maint createunit (noscan) - Add device syntax options**

## **maint deleteunit**

### **Description:**

To delete an existing RAID array unit.

### **Example:**

```
3ware CLI> maint deleteunit c0 u2
```

### **Sample of output:**

```
Deleted unit 2
```



### **Warning!**

Backup any critical data prior to deleting a unit. Failure to do so will result in lost data.

---



---



### Warning!

You must first unmount the SCSI device in Linux before issuing the deleteunit command. CLI will not prevent you from deleting a mounted device.

---

---

#### **Example: Deleting 3 RAID-1 Arrays and Creating a Single RAID-5 Array**

```
3ware CLI> info c0
Controller 0
```

```
-----
Model:      7500-12
FW:        FE7X 1.05.00.042
BIOS:      BE7X 1.08.00.044
Serial #:  M12600A2170030
PCB:       Rev3
PCHIP:    V1.30
ACHIP:    V3.20
```

```
# of units: 5
```

```
Unit 0: RAID 1 30.01 GB (58631296 blocks): OK
Unit 2: RAID 1 122.94 GB (240119680 blocks): OK
Unit 4: RAID 1 122.94 GB (240119680 blocks): OK
Unit 6: RAID 1 122.94 GB (240119680 blocks): OK
Unit 8: RAID 5 245.88 GB (480253440 blocks): OK
```

```
# of ports: 12
```

```
Port 0: QUANTUM FIREBALLP LM30 186013438780
30.02 GB (58633344 blocks): OK (unit 0)
Port 1: QUANTUM FIREBALLP LM30 186013534268
30.02 GB (58633344 blocks): OK (unit 0)
Port 2: Maxtor 4G120J6 G6037FAE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 3: Maxtor 4G120J6 G603GLDE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 4: Maxtor 4G120J6 G603G1RE 122.94 GB
```

```

(240121728 blocks): OK (unit 4)
Port 5: Maxtor 4G120J6 G6037FPE 122.94 GB
(240121728 blocks): OK (unit 4)
Port 6: Maxtor 4G120J6 G603FZRE 122.94 GB
(240121728 blocks): OK (unit 6)
Port 7: Maxtor 4G120J6 G603F9TE 122.94 GB
(240121728 blocks): OK (unit 6)
Port 8: Maxtor 98196H8 V80FZGRC 81.96 GB
(160086528 blocks): OK (unit 8)
Port 9: Maxtor 98196H8 V80HRGWC 81.96 GB
(160086528 blocks): OK (unit 8)
Port 10: Maxtor 98196H8 V80HRG2C 81.96 GB
(160086528 blocks): OK (unit 8)
Port 11: Maxtor 98196H8 V80GXC1C 81.96 GB
(160086528 blocks): OK (unit 8)

```

**Step 1:** Backup any data (not shown) and unmount all arrays being deleted

```

linux:~ # umount /dev/sdb1
linux:~ # umount /dev/sdc1
linux:~ # umount /dev/sdd1

```

**Step 2:** Delete RAID arrays or units in CLI

```

3ware CLI> maint deleteunit c0 u2
Deleted unit 2

```

```

3ware CLI> maint deleteunit c0 u4
Deleted unit 4

```

```

3ware CLI> maint deleteunit c0 u6
Deleted unit 6

```



**Note:** sda and sde remains available, but sdb, sdc, and sdd are no longer available to Linux:

---

---

```
linux:~ # fdisk /dev/sda
```

The number of cylinders for this disk is set to 3649.

There is nothing wrong with that, but this is larger than 1024, and could in certain setups cause problems with:

- 1) software that runs at boot time (e.g., old versions of LILO)
- 2) booting and partitioning software from other OSs (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): q

```
linux:~ # fdisk /dev/sdb
```

Unable to open /dev/sdb

```
linux:~ # fdisk /dev/sdc
```

Unable to open /dev/sdc

```
linux:~ # fdisk /dev/sdd
```

Unable to open /dev/sdd

```
linux:~ # fdisk /dev/sde
```

Device contains neither a valid DOS partition table,  
nor Sun, SGI or OSF disklabel

Building a new DOS disklabel

Changes will remain in memory only, until you decide  
to write them. After that, of course, the pre-  
vious content won't be recoverable.

The number of cylinders for this disk is set to 29894.

There is nothing wrong with that, but this is larger than 1024, and could in certain setups cause problems with:

- 1) software that runs at boot time (e.g., old versions of LILO)
- 2) booting and partitioning software from other OSs (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): q

### **Step 3:** Create new RAID-5 unit in CLI

```
3ware CLI> maint createunit c0 rraid5 k64
                p2:3:4:5:6:7
Created unit 2
```

### **Step 4:** Partition and format new array

```
linux:~ # fdisk /dev/sdb
```

The number of cylinders for this disk is set to 74733.

There is nothing wrong with that, but this is larger than 1024, and could in certain setups cause problems with:

- 1) software that runs at boot time (e.g., old versions of LILO)
- 2) booting and partitioning software from other OSs (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): n

Command action

- e extended
- p primary partition (1-4)

```
P
Partition number (1-4): 1
First cylinder (1-74733, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-74733,
    default 74733):
Using default value 74733

Command (m for help): w
The partition table has been altered!
```

Calling ioctl() to re-read partition table.

Syncing disks.

```
linux:~ # mkfs /dev/sdb1
```

```
mke2fs 1.26 (3-Feb-2002)
```

```
Filesystem label=
```

```
OS type: Linux
```

```
Block size=4096 (log=2)
```

```
Fragment size=4096 (log=2)
```

```
75038720 inodes, 150073197 blocks
```

```
7503659 blocks (5.00%) reserved for the super user
```

```
First data block=0
```

```
4580 block groups
```

```
32768 blocks per group, 32768 fragments per group
```

```
16384 inodes per group
```

```
Superblock backups stored on blocks:
```

```
    32768, 98304, 163840, 229376, 294912, 819200,
```

```
    884736, 1605632, 2654208, 4096000, 7962624,
```

```
    11239424, 20480000, 23887872, 71663616, 78675968,
```

```
    102400000
```

```
Writing inode tables:   95/4580
```

### **Step 5:** Verify changes

```
3ware CLI> info c0
```

```
Controller 0
```

-----

Model: 7500-12  
FW: FE7X 1.05.00.042  
BIOS: BE7X 1.08.00.044  
Serial #: M12600A2170030  
PCB: Rev3  
PCHIP: V1.30  
ACHIP: V3.20

# of units: 3

Unit 0: RAID 1 30.01 GB (58631296 blocks): OK  
Unit 2: RAID 5 614.70 GB (1200598400 blocks): OK  
Unit 8: RAID 5 245.88 GB (480253440 blocks): OK

# of ports: 12

Port 0: QUANTUM FIREBALLP LM30 186013438780  
30.02 GB (58633344 blocks): OK (unit 0)  
Port 1: QUANTUM FIREBALLP LM30 186013534268  
30.02 GB (58633344 blocks): OK (unit 0)  
Port 2: Maxtor 4G120J6 G6037FAE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 3: Maxtor 4G120J6 G603GLDE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 4: Maxtor 4G120J6 G603G1RE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 5: Maxtor 4G120J6 G6037FPE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 6: Maxtor 4G120J6 G603FZRE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 7: Maxtor 4G120J6 G603F9TE 122.94 GB  
(240121728 blocks): OK (unit 2)  
Port 8: Maxtor 98196H8 V80FZGRC 81.96 GB  
(160086528 blocks): OK (unit 8)  
Port 9: Maxtor 98196H8 V80HRGWC 81.96 GB  
(160086528 blocks): OK (unit 8)  
Port 10: Maxtor 98196H8 V80HRG2C 81.96 GB  
(160086528 blocks): OK (unit 8)

```
Port 11: Maxtor 98196H8 V80GXC1C 81.96 GB  
(160086528 blocks): OK (unit 8)
```



### **Warning!**

When adding a new CBOD or SPARE drive to replace a defective drive the unit number may not be the same as the port number. Always double check the unit number before deleting a unit.

---

---

In the example below removing port# 9 degraded the RAID-1 array consisting of ports 9 and 10. One might assume that re-adding port# 9 back as a spare drive is now unit# 9. This is not correct since the original array retains the original unit number until the next reboot. The new spare is actually assigned the next available unit number, in this case unit# 0, since unit# 9 was still in use. Deleting unit# 9 to delete the newly added spare drive would actually delete the remaining member of the RAID-1 array and your data!

Example:

```
3ware CLI> info c0  
Controller 0  
-----  
Driver:    1.02.00.032  
Model:    7500-12  
FW:       FE7X 1.05.00.043  
BIOS:     BE7X 1.08.00.045  
Monitor:  ME7X 1.01.00.035  
Serial #: M12600A2170030  
PCB:      Rev3  
PCHIP:    V1.30  
ACHIP:    V3.20  
  
# of units: 4
```



```
Unit 1: RAID 10 60.03 GB (117262592 blocks): OK
Unit 2: RAID 5 491.76 GB (960478720 blocks):
DEGRADED
Unit 3: CBOD 122.94 GB (240121728 blocks): OK
OFFLINE
Unit 9: RAID 1 81.96 GB (160084480 blocks): OK
```

```
# of ports: 12
```

```
Port 0: QUANTUM FIREBALLP LM30 186013438780 30.02
GB (58633344 blocks): OK (NO UNIT)
Port 1: QUANTUM FIREBALLP LM30 186013534268 30.02
GB (58633344 blocks): OK (unit 1)
Port 2: Maxtor 4G120J6 G6037FAE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 3: Maxtor 4G120J6 G603GLDE 122.94 GB
(240121728 blocks): OK (unit 3)
Port 4: Maxtor 4G120J6 G603G1RE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 5: Maxtor 4G120J6 G6037FPE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 6: Maxtor 4G120J6 G603FZRE 122.94 GB
(240121728 blocks): OK (unit 1)
Port 7: Maxtor 4G120J6 G603F9TE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 8: Maxtor 98196H8 V80FZGRC 81.96 GB
(160086528 blocks): OK (unit 1)
Port 9: Maxtor 98196H8 V80HRGWC 81.96 GB
(160086528 blocks): OK (unit 9)
Port 10: Maxtor 98196H8 V80HRG2C 81.96 GB
(160086528 blocks): OK (unit 9)
Port 11: Maxtor 98196H8 V80GXC1C 81.96 GB
(160086528 blocks): OK (unit 1)
```

```
3ware CLI> maint remove c0 p9
```

```
Successfully removed drive from port 9 on control-
ler 0
```

```
3ware CLI> maint add c0 p9 spare
Successfully added a SPARE to port 9 on controller 0
```

```
3ware CLI> maint deleteunit c0 u9
Deleted unit 9
```

```
3ware CLI> info c0
Controller 0
```

```
-----
Driver: 1.02.00.032
Model: 7500-12
FW: FE7X 1.05.00.043
BIOS: BE7X 1.08.00.045
Monitor: ME7X 1.01.00.035
Serial #: M12600A2170030
PCB: Rev3
PCHIP: V1.30
ACHIP: V3.20
```

```
# of units: 4
Unit 0: SPARE 81.96 GB (160086528 blocks): OK
OFFLINE
Unit 1: RAID 10 60.03 GB (117262592 blocks): OK
Unit 2: RAID 5 491.76 GB (960478720 blocks):
DEGRADED
Unit 3: CBOD 122.94 GB (240121728 blocks): OK
OFFLINE
```

```
# of ports: 12
Port 0: QUANTUM FIREBALLP LM30 186013438780
30.02 GB (58633344 blocks): OK (NO UNIT)
Port 1: QUANTUM FIREBALLP LM30 186013534268
30.02 GB (58633344 blocks): OK (unit 1)
Port 2: Maxtor 4G120J6 G6037FAE 122.94 GB
(240121728 blocks): OK (unit 2)
Port 3: Maxtor 4G120J6 G603GLDE 122.94 GB
(240121728 blocks): OK (unit 3)
```

```

Port    4:  Maxtor  4G120J6  G603G1RE  122.94  GB
(240121728 blocks): OK (unit  2)
Port    5:  Maxtor  4G120J6  G6037FPE  122.94  GB
(240121728 blocks): OK (unit  2)
Port    6:  Maxtor  4G120J6  G603FZRE  122.94  GB
(240121728 blocks): OK (unit  1)
Port    7:  Maxtor  4G120J6  G603F9TE  122.94  GB
(240121728 blocks): OK (unit  2)
Port    8:  Maxtor  98196H8  V80FZGRC  81.96   GB
(160086528 blocks): OK (unit  1)
Port    9:  Maxtor  98196H8  V80HRGWC  81.96   GB
(160086528 blocks): OK (unit  0)
Port   10:  Maxtor  98196H8  V80HRG2C  81.96   GB
(160086528 blocks): OK (NO UNIT)
Port   11:  Maxtor  98196H8  V80GXC1C  81.96   GB
(160086528 blocks): OK (unit  1)

```

## **maint rebuild successful**

### **Description:**

To rebuild a degraded array, unit 2 on controller 0, with a disk drive that is attached to port 3.

### **Example:**

```
3ware CLI> maint rebuild c0 u2 p3
```

### **Sample of output:**

```
Rebuild started on unit 2 on controller 0
```



**Note:** When rebuilding a degraded RAID 10, the first degraded subunit mirrored pair that is found will be rebuilt. When issuing a *rebuildstatus* command immediately after the rebuild of a RAID 10 has started, the overall percentage complete of that array will display 50%. However, the degraded subunit that is being rebuilt will display 0%. If there are multiple degraded mirror pairs in a RAID 10 array, the

command will need to be issued again to initiate a rebuild on additional degraded pairs.

---

---

## **maint flush**

### ***Description:***

To flush the cache on all units attached to controller 1.

### ***Example:***

```
3ware CLI> maint flush c1
```

#### **Sample of output:**

```
Flushed cache on controller 1 unit 0  
Flushed cache on controller 1 unit 6  
Flushed cache on controller 1 unit 8
```

## **maint flush on specific unit**

### ***Description:***

To flush the cache only on unit 6 of controller 1.

### ***Example:***

```
3ware CLI> maint flush c1 u6
```

#### **Sample of output:**

```
Flushed cache on controller 1 unit 6
```

## **maint verify**

### ***Description:***

To start a verify on unit 3 of controller 2.

### ***Example:***

```
3ware CLI> maint verify c2 u3
```

#### **Sample of output:**

```
Verify successfully started on unit 3 on controller 2
```

The Verify feature verifies the redundancy of all RAID 1, 5 and 10 arrays. Arrays must be initialized and cannot be degraded to be verified. If the verify array process determines that the mirrored drives are not identical

or the parity is not correct, the array is degraded and the rebuild process is launched.

For RAID 1 or 10 Arrays: RAID 1 and 10 arrays are not profiled when created, or initialized after booting into the OS. When the firmware receives the first verify request, given that the array was never initialized, the initialization will then begin. Any subsequent verify operations will then perform the verification of the array (check data consistency). An AEN will inform the user that the first verify is actually an initialization.

## Alarms

### The *alarms* command

The *alarms* command provides a log of alarms, also called Automatic Event Notifications (AENs), that have occurred on the disk arrays. An alarm occurs when the ATA RAID controller requires attention, such as when a disk array becomes degraded and is no longer fault tolerant. SMART notifications appear in this display. Alarm messages are categorized by the following levels of severity:

- Errors
- Warnings
- Information



**Note:** When this command is executed, only AENs that have been logged since the last time the command was executed will be displayed. AENs are also saved in a text file at `/var/log/messages`.

---

---



**Warning!**

3ware does not recommend installing both 3DM and CLI. Conflicts may occur. Alarms will only be captured by one utility if both are installed.

---

---



**Warning!**

3DM and CLI handle alarms differently. CLI does not timestamp or save alarms as 3DM does. When using CLI, save the alarm data. Once the alarms are viewed, they cannot be viewed again.

---

---

## Examples using Interactive Mode

**Example:**

```
3ware CLI> alarms
```

Sample of output:

```
Controller 1 Alarms
-----
INFO: Verify started: Unit #0
ERROR: Drive error: Port #0
ERROR: Unit degraded: Unit #0
INFO: Rebuild started: Unit #0
INFO: Rebuild complete: Unit #0
-----
```

# Help

## The *help* command

The *help* command displays a list of the CLI commands and options.

## Examples using Interactive Mode

### **Example:**

```
Esclade CLI> help
```

### **Sample of output:**

```
Copyright (c) 2003 3ware, Inc. All rights reserved.
```

```
3ware CLI (version 2.00.00.006)
```

```
List of Commands
```

```
-----  
info - displays information about the controller  
  
alarms - displays or deletes the list of AENs  
  
set - displays or modifies controller settings  
  
maint - performs maintenance operations on the  
        controllers  
  
quit - exits the CLI
```

Type `help <command>` to get more details about a particular command

**Example:**

```
3ware CLI> help info
```

**Sample of output:**

This command will show you various pieces of information about controllers.

```
info [c<c> [u<u>|p<p>] [item]]
```

c - the controller id

u - the unit id

p - the port id

- If u is specified, item can be one of the following:  
*status, rebuildstatus, verifystatus, initializestatus*
- If p is specified, item can be one of the following:  
*status, model, serial, capacity, smart*
- If neither u or p is specified, item can be one of the following:  
*driver, model, firmware, bios, monitor, serial, pcb, pchip, achip, numports, numunits, numdrives, unitstatus, drivestatus*



**Example:**

```
Esclade CLI> help alarms
```

**Sample of output:**

This command will display alarms for each controller

```
alarms
```

**Example:**

```
Esclade CLI> help set
```

**Sample of output:**

This command will adjust certain settings on the controllers

```
set [
    rebuild c<c> <1..5> |
    cache c<c> u<u> [on|off]
]
```

c - the controller id

u - the unit id

If set is called without arguments, it will display rebuild and cache information for all controllers.

**Example:**

```
3ware CLI> help maint
```

**Sample of output:**

This command will perform certain maintenance functions on the controllers

```
maint [
    add c<c> p<p> [jbod|cbod|spare] |
    remove c<c> p<p> |
```

```
createunit c<c> r<raid<0|1|10|5>|<j|c>bod|spare>
    [k<stripe>] p<p:p..> [noscan] |
deleteunit c<c> u<u> [noscan] |
rebuild c<c> u<u> p<p> [ignoreECC] |
flush c<c> [u<u>] |
verify c<c> u<u> [stop]
]
```

c - the controller id

u - the unit id

p - the port id

For createunit, the k argument (stripe) is only valid for the following:

**raid0, raid10, raid5**

Valid values for the k argument (stripe) are the following (in KB):

**16, 32, 64, 128, 256, 512, 1024**

(Note: Raid5 can only be 64kb.)

If no unit is specified for flush, it will flush the cache on all units.

The "noscan" option for "create" and "delete unit" tells the CLI to NOT notify of the creation or deletion of a logical volume.

**Example:**

Esclade CLI> help quit

**Sample of output:**

This command quits the CLI

```
quit
```

Synonyms: q exit

# 3ware Technical Support and Services

Product information, Frequently Asked Questions, software upgrades, driver files and other support are available through the 3ware World Wide Web site at <http://www.3ware.com>. 3ware's software library is accessible at: <http://www.3ware.com/support/download.asp>. For specific answers to questions or to give feedback about the product, visit our Web site at <http://www.3ware.com/support> and use our convenient e-mail form. 3ware also offers toll-free (877) 883-9273 and (408) 523-1111 direct phone support during normal business hours.

## Sales and ordering information

For sales information, send an electronic mail message to [sales@3ware.com](mailto:sales@3ware.com).

## Feedback on this manual

Your feedback is welcome. If anything in the guide seems unclear please let us know by sending e-mail to [support@3ware.com](mailto:support@3ware.com).

