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Promise Technologies FastTrak100 IDE RAID Controller

Overview

ATA R.A.I.D. provides affordable data redundancy and fault-tolerance without the expense and complexity of SCSI devices. Also, inexpensive ATA drives of capacities in excess of one hundred gigabytes are now commonly available, bringing mass storage in to reach of most organisations. Both of these technologies have matured to a high level of stability, making them viable solutions for mission critical environments. This document outlines the use of these technologies with the worlds leading Internet filtering technology, ContentKeeper.

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Introduction

This document contains a brief introduction to the FastTrak100 as well as step-by-step installation instructions. For more information about the FastTrak100 refer to the Promise Technologies web site (<http://www.promise.com>).

Red Hat Linux Support

At the time of the publication of this document the following versions of Red Hat Linux support the Promise Technologies Embedded FastTrak100 IDE RAID controller:

- Red Hat Linux 6.2
- Red Hat Linux 7.1

What Is The FastTrak100?

Promise designed its FastTrak100 card to provide a high performance RAID card that adds performance and/or reliability to servers using Ultra ATA/100, Ultra ATA/66, Ultra ATA/33 or EIDE drives. FastTrak100 supports striping (RAID 0), mirroring (RAID 1), striping/mirroring (RAID 0+1), or spanning (JBOD) operation, respectively.

With striping, identical drives can read and write data in parallel to increase performance. Mirroring increases read performance through load balancing and elevator seek while creating a complete backup of your files. Striping with mirroring offers both high read/write performance and error tolerance. Spanning uses the full capacity of all attached drives without requiring identical drive size, but offers no other RAID functionality.

A FastTrak100 striped array can double the sustained data transfer rate of Ultra ATA/100 drives. FastTrak100 fully supports Ultra ATA/100 specification of up to 100 MB/sec per drive, depending on individual drive specifications.

FastTrak100 also offers fault tolerant, data redundancy for entry-level network file servers or simply for desktop PC users wanting to continually protect valuable data on their PC. FastTrak100 offers “**Security**”, RAID 1 mirroring (for two drives) and “**Performance**”, RAID 0+1 mirroring and striping (for four drives) to protect data. Should a drive that is part of a mirrored array fail, FastTrak100 uses the mirrored drive (which contains identical data) to assume all data handling. When a new replacement drive is later installed, FastTrak100 rebuilds data to the new drive from the mirrored drive to restore fault tolerance.

FastTrak100's bootable BIOS supports individual drives larger than 8.4GB. With FAT32 and NTFS partitioning, the array can be addressed as one large *single* volume.

Supported Hard Drives

Adhere to the following guidelines when installing or replacing hard drives. Hard drives must be Ultra ATA/100, Ultra ATA/66, Ultra ATA/33, EIDE and/or Fast ATA-2 compatible to operate with the FastTrak100 RAID Adapter. For optimal performance, install all *identical* drives of the same model and capacity. The drives' *matched performance* allows the array to function better as a single drive.

Configuring Disk Arrays

Creating A Disk Array

Use the onboard FastBuild BIOS utility to create an array from the attached drives. Always use a Security array (mirroring, RAID-1) with ContentKeeper. This adds a layer of redundancy to the data on the ContentKeeper appliance . . . which means if one of the hard disks fails not all is lost, ContentKeeper may still be rebuilt.

Below are step-by-step instructions for creating an array. Use them if you are building or rebuilding ContentKeeper.

1. Boot your system. If this is the first time you have booted with the FastTrak100 installed, or there are currently no arrays defined, the Promise onboard BIOS will display the following screen.

```
FastTrak100 (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

No array defined . . .

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.
```

If any arrays have been defined then a screen similar to the following one will be displayed.

```
FastTrak100 (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

ID   MODE           SIZE   TRACK-MAPPING   STATUS
=====
1 *  1x2 Mirror     16126M  611/128/32     Functional

Press <Ctrl-F> to enter FastBuild (tm) Utility....
```

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu

If there were no predefined arrays reported during the boot up process, go to step 4.

3. Press “4” to display the Delete Array Menu. Use the arrow keys to select, and the delete key / Control-Y keys to delete any existing arrays.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
===== [ View Array Definition Menu ]=====

Array No  RAID Mode      Total Drv  Capacity(MB)  Status
Array 1     Stripe           2             16126           Functional

Stripe Block: 64 KB

===== [ Drive Assignments ]=====

Channel:ID  Drive Model          Capacity (MB) Assignment
  1 : Master QUANTUMCR8.4A      8063           Y
  1 : Slave  QUANTUMCR8.4A      8063           N
  2 : Master QUANTUMCR8.4A      8063           Y

=====
Are you sure you want to delete this array?
Press Ctrl-Y to Delete, or others to abort . .
=====
```

Press “Escape” to exit the Delete Array Menu when all arrays are deleted.

4. Press “1” to display the Auto Setup Menu below. This is the fastest and easiest method for creating an array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
===== [Auto Setup Options Menu]=====

Optimize Array for: Security
Typical Application usage: Not Available

===== [ Auto Setup Configuration ]=====

Mode.....Mirror
Drives used in Array .....2
Array Disk Capacity .....16126

===== [ Keys Available ]=====

[↑] Up [↓] Down [←, →, Space] Change Option [ESC] Exit [Ctrl-Y] Save
```

- Using the Spacebar, choose “Security” under the **Optimize Array for** section.
- Press <Ctrl-Y> keys to Save your selection. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No)
 Y - Create and Duplicate
 N - Create Only

Press “N” for the Create Only option.

- A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system.

Array has been created.
 <Press Any Key to Reboot>

Repairing A Failed Disk Array

A ContentKeeper appliance freezing or exhibiting erratic behaviour may indicate a failed disk array. This may be confirmed by rebooting the appliance and observing what is reported by the Promise onboard BIOS.

FastTrak100 (tm) BIOS Version 1.xx (Build xxxx)
 (c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

ID	MODE	SIZE	TRACK-MAPPING	STATUS
=====				
1 *	1x2 Mirror	16126M	611/128/32	Critical

Press <Ctrl-F> to enter FastBuild (tm) Utility....

If the array is reported as critical then proceed with the remainder of this section, otherwise refer to the FastTrak100 manual. Information on obtaining the manual may be found in the Getting Support section below.

- When prompted during bootup, press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.
- Press “3” to display the View Array Menu.
- Use the arrow keys to select the failed array, and identify the channel and ID of the failed drive.
- Power off the server and physically remove the failed drive.
- Replace the failed drive with an identical model.

6. Reboot the server and, when prompted, press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.

7. Press “5” to display the Rebuild Array Menu.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
===== [Rebuild Array Menu]=====

Array No  RAID Mode      Total Drv  Capacity (MB)  Status
Array 1    Mirror                2             16126            Critical

===== [ Keys Available ]=====

[↑] Up [↓] Down  [ESC] exit  [Enter] Select
```

8. Use the arrow keys to highlight the array whose status is critical, then select it by pressing the <Enter> key. The following screen will appear.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
===== [Rebuild Array Menu]=====

Array No  RAID Mode      Total Drv  Capacity(MB)  Status
Array 1    Mirror                2             16126            Critical

Stripe Block: Not Available

===== [ Select Drive for Rebuild ]=====

Channel:ID      Drive Model      Capacity (MB)
1 : Slave        QUANTUMCR8.4A     8063

===== [ Keys Available ]=====

[↑] Up [↓] Down  [ESC] exit  [Enter] Select
```

9. Use the arrow keys to highlight the replacement drive.

10. Press <Enter> and confirm that the data will be copied on to the selected drive. All data on the replacement drive will be written over with mirrored information from the array drive. A progress bar will appear to indicate the progress of the rebuild.

11. A window will appear confirming that your Security array has been rebuilt. Press any key to reboot the system.

```
Array has been rebuilt.
<Press Any Key to Reboot>
```

Red Hat Linux

IMPORTANT: Do not enter quotation marks “” or brackets <> when entering commands. Pressing the <RETURN> key is implied after the closing quotation mark for each command.

Note: You will need 2 blank 1.44Mb floppy disks.

Preparing the Array Driver Source Disk

The FastTrak100 driver files for single processor and multi processor systems are available for download from the Documentation page of the ContentKeeper web site (<http://www.contentkeeper.com>). The files are named:

ftrehup_120b9.tar – Single-processor
ftrhsmp_120b9.tar – Multi-processor

Download the appropriate file, i.e. single or multi-processor, and copy it to a blank DOS formatted 1.44Mb floppy disk. This disk will be referred to as the **array driver source disk**.

Preparing the FastTrak Array Diver Disk

You should be able to perform the following procedure on any unix or linux workstation. The procedure may be performed on ContentKeeper. Exit from the console screen with <SHIFT>-<Q>, then log on with a user name of "root"; the default password at shipping is "ck2001".

1. Place the **array driver source disk** in to the floppy drive and mount it by typing “**mount /mnt/floppy**”
2. Change directory to /usr by typing the following:
“**cd /usr**”
3. Copy the array driver file from the **array driver source disk** to the hard drive by typing “**cp /mnt/floppy/FILENAME /usr/FILENAME**” where FILENAME is the name of the file on the **array driver source disk**.
4. Unmount the **array driver source disk** by typing the following:
“**umount /mnt/floppy**”
5. Remove the **array driver source disk** and insert the other blank floppy disk.
6. From a command prompt type **mkfs -t ext2 /dev/fd0** and press enter
7. When the disk has formatted, type **e2fsck -c /dev/fd0** and press enter

Note: Step 7. is to perform a check on the file system and can be skipped.

8. Mount the floppy disk by typing "**mount /mnt/floppy**" then copy the array driver source file to the floppy disk as follows:

"**cp /usr/FILENAME /mnt/floppy/FILENAME**" where FILENAME is the name of the file that was copied from the **array driver source disk**.

9. Change directory to the floppy by typing "**cd /mnt/floppy**"

9. Decompress FILENAME as follows "**tar xvf FILENAME**" where FILENAME is the name of the file on the floppy disk.

9. Change directory by typing **cd /**

10. Unmount the floppy disk as follows "**umount /mnt/floppy**".

11. You now have another FastTrak100 Array Driver Disk.

Red Hat Linux Setup

Start the Red Hat Linux installation with the procedure below, followed by the one outlined in the installation guide or administration guide.

1. **Insert RedHat CD 1** into the CDROM

2. **Re-Boot** the system if necessary, to start the RedHat Installation

3. At the "Welcome to Red Hat Linux ..." installation screen, a prompt labelled "boot:" will appear at the bottom of the screen. Type the following:

"linux ide0=0x1f0,0x3f6,14 ide1=0x170,0x376,15 ide2=0 ide3=0 ide4=0 ide5=0 ide6=0 ide7=0 ide8=0 ide9=0 expert" then press enter

4. When prompted select **yes to load drivers**

5. When prompted insert the driver floppy disk and **select ok**

6. At the section entitled **Lilo Configuration** (About 5 pages into the installation), type the following (minus the quotes) into the kernel parameters box: **"ide0=0x1f0,0x3f6,14 ide1=0x170,0x376,15 ide2=0 ide3=0 ide4=0 ide5=0 ide6=0 ide7=0 ide8=0 ide9=0"**

Note: The kernel parameters box is about half way down the screen.

7. Complete the Red Hat Installation as per the ContentKeeper installation instructions.

Getting Support

ContentKeeper Technologies

Email to: support@contentkeeper.com

Promise Technologies

Web Site: <http://www.promise.com>

Linux support: http://www.promise.com/support/linux_eng.asp

Documentation:

http://www.promise.com/support/download2_eng.asp?mode=download&product_id=15