

# HP Embedded SATA RAID Controller

## User Guide



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## Abstract

This guide provides reference information for using the HP Embedded SATA RAID Controller to configure SATA drive arrays.

## Audience assumptions

This guide is for the person who installs, administers, and troubleshoots servers. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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# Controller features

The HP Embedded SATA RAID Controller enables you to create arrays with RAID levels 0 and 1 on SATA hard drives in specified HP ProLiant server models.

For a complete list of the controller attributes and information about the compatibility of particular operating systems with the controller, refer to the HP website (<http://www.hp.com>).

## Installing the driver

A link to the downloadable driver for the controller is provided on the controller-specific page of the HP website, <http://www.hp.com>. Installation instructions are provided with the driver.

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# Configuring an array

Two utilities are provided to enable you to configure arrays on the controller:

- The menu-based RAID Configuration Utility, located on the controller BIOS, enables you to configure an array even before the driver or operating system is installed. However, this utility can be opened and used only while the system is rebooting, before any installed operating system is loaded. Also, you cannot change the properties of an existing array using this tool.

The rest of this guide describes how to use this tool.

- The GUI-based HP Storage Manager is provided on the HP website as an executable file that you install after you have installed the driver and operating system. This utility enables you to create new arrays and change the properties of an existing array. You can use this utility at any convenient time after the system has booted and the operating system has loaded.

For detailed information about using this tool, refer to the separate *HP Storage Manager User Guide* provided with the utility.

## Using the RAID Configuration Utility

The RAID Configuration Utility is loaded on the controller ROM. To run the utility, press the **Ctrl+A** keys or the **F8** key (depending on the version of the ROM) when prompted by the following message during system startup:

```
Press <Ctrl><A> for Adaptec RAID Configuration Utility
```

or

```
Press <F8> for HP Embedded SATA Setup
```

To select an option from any of the menus within the RAID Configuration Utility, browse with the arrow keys, and then press the **Enter** key. In some cases, selecting an option displays another menu. To return to the previous menu at any time, press the **Esc** key.

The main option on the RAID Configuration Utility menu is the array configuration utility, which enables you to:

- Create an array
- Manage an array
- Add or delete a hotspare
- Configure a drive
- Rebuild an array
- Verify drives

The procedures for performing each of these tasks are described in the following sections.

## Creating an array

Before creating an array, be sure that the drives to be used for the array are installed in your system and have been configured (on page 8). If the utility displays a drive in gray, the drive does not have any usable space, and it cannot be used to create an array.



**CAUTION:** Before adding a drive to an array, back up any data on the drive. Otherwise, the data will be lost.


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To create an array:

1. Power down the computer, and then restart it.
2. When the appropriate prompt appears during POST, press the **Ctrl+A** keys or the **F8** key to access the RAID Configuration Utility.
3. From the menu, select **Array Configuration Utility**.
4. From the array configuration utility menu, select **Create Array**.
5. Highlight a drive to be used in the new array, and then press the **Insert** key.
6. Repeat the previous step to select a second drive. (To deselect a drive, highlight the drive and press the **Delete** key.)
7. Press the **Enter** key when both drives for the new array are selected.

The Array Properties menu appears, showing the RAID levels (types of array) that can be configured for the selected number of drives. (For this controller, RAID 0 and RAID 1 are shown. Both of these RAID levels require two drives.)

8. Select the RAID level that you want to create, and press the **Enter** key.
9. (Optional) Enter a label of no more than 15 characters to identify the array.
10. If you are creating a RAID 0 array, select the stripe size that you want the array to use. Available stripe sizes are 16, 32, and 64 KB (the default setting).
11. Select one of the options listed under the Create Using heading to determine the method that the controller is to use to build the array. Table 1 describes typical circumstances for which each method is appropriate.

 **CAUTION:** Do not interrupt the creation of a RAID 0 array using the Migrate method. If you do, there is no way to restart the array creation or to recover the data that was on the source drive.

 **CAUTION:** Do not use the Migrate or Build methods to create an array on Microsoft® Windows® dynamic disks (volumes). These methods cause data loss in this case.

**Table 1** Choosing a method for creating the array

RAID level	Method	Method is appropriate for...
0	No Init	Creating a RAID 0 array on new drives.
0	Migrate	Creating a RAID 0 array when you want to preserve data on an existing drive. If you select this option, you are asked to designate the source drive. The contents of the source drive are preserved and any data on the new drive is lost.
1	Build	Creating a RAID 1 array when you want to preserve data on an existing drive. If you select this option, you are asked to designate the source drive. The contents of the source drive are preserved and any data on the new drive is lost.
1	Clear	Creating a RAID 1 array on new drives, or when you want to be sure that the new array contains no existing data.
1	Quick Init	Creating a RAID 1 array on new drives. This is the fastest way to create a RAID 1 array.



**NOTE:**

- If you pause a Build or Clear process on a RAID 1 array, you can restart the process by pressing the **Ctrl+R** keys.
- A RAID 1 array created using the Quick Init option might return some data mismatches if you later run a consistency check. This is normal and is not a cause for concern.
- You can use drives of different sizes in a RAID 1 array. However, during a Build operation, only the smaller drive can be selected as the source drive.
- When migrating from single volume to a RAID 0 array, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must have at least half the capacity of the source drive.

12. Click **Done**.

## Managing arrays

With the Manage Arrays option, you can:

- View array properties
- Make an array bootable
- Delete an array

### Viewing array properties

1. From the main menu of the array configuration utility, select **Manage Arrays**, and press the **Enter** key.
2. From the List of Arrays dialog box, select the array whose properties you want to view, and press the **Enter** key.

The Array Properties dialog box appears, showing detailed information about the array. The physical disks associated with the array appear here.



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**NOTE:** A maximum of two physical drives are supported per RAID set. The controller is capable of supporting multiple RAID sets.

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3. Press the **Esc** key to return to the previous menu.

## Making an array bootable

1. From the main menu of the array configuration utility, select **Manage Arrays**, and press the **Enter** key.
2. From the List of Arrays, select the array that you want to make bootable, and press the **Ctrl+B** keys. An asterisk appears next to the array to indicate that it is bootable.  
To make an array nonbootable, select the array and press the **Ctrl+B** keys.

## Deleting an array



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**CAUTION:** Before you delete an array, back up any important data on the array. Otherwise, the data will be lost. Deleted arrays cannot be restored.

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1. From the main menu of the array configuration utility, select **Manage Arrays**, and press the **Enter** key.
2. Select the array that you want to delete and press the **Delete** key.
3. In the Array Properties dialog box, select **Delete**, and press the **Enter** key. The following prompt appears:  
Warning!! Deleting the array will render the array unusable.  
Do you want to delete the array? (Yes/No):
4. **Enter Yes**. The following prompt appears:  
To delete the partition table, choose which member:  
member #0, member #1, both, none
5. Select the member to be deleted.
6. Press the **Esc** key to return to the previous menu.

## Adding or deleting a hotspare

1. From the main menu of the array configuration utility, select **Add/Delete Hotspares**
2. Use the arrow keys to highlight the drive that you want to assign as a hotspare, and press the **Insert** key.
3. Press the **Enter** key. The following prompt appears:  
Do you want to create spare? (Yes/No)
4. Enter **Yes**. The spare that you have selected appears in the Selected Drive menu.

## Configuring a drive



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**CAUTION:** If you configure a drive that is already part of an array, the array might become unusable. Do not configure a drive that is part of a boot array. To determine which drives are associated with a particular array, refer to on page 5.

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1. From the main menu of the array configuration utility, select **Configure Drives**.
2. Use the arrow keys to highlight the drive that you want to configure, and press the **Insert** key.
3. If you want to add another drive to be configured, repeat the previous step.
4. Press the **Enter** key.
5. Read the warning message, and confirm that you have selected the correct drives to configure.
6. Press the **Y** key to continue.

## Rebuilding an array

If a drive in a fault-tolerant (RAID 1) array fails, you can return the array to optimal status by performing a rebuild.

There are two ways to perform a rebuild:

- Shut down the system, replace the failed drive, and begin the rebuild at the next system restart.
- Add a hotspare to the array if necessary, and select the array for a manual rebuild.

## System shutdown rebuild

1. Power down the system.
2. Replace the failed drive with a new one of equal or greater capacity.
3. Restart the system.
4. At the appropriate prompt during POST, press the **Ctrl+A** keys or the **F8** key to access the **RAID Configuration Utility**.
5. From the menu, select **Array Configuration Utility**.
6. From the main menu of the array configuration utility, select **Add/Delete Hotspares**.
7. Assign the new drive as a hotspare. This starts the Rebuild task. All the data from the good drive is copied to the new one, and the original RAID 1 array is re-created.

## Manual rebuild



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**IMPORTANT:** If a hard drive in the array fails and the array does not have a hotspare, you must add a hotspare before you can rebuild the array. Refer to on page 5.

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1. From the main menu of the array configuration utility, select **Manage Arrays**.
2. From the List of Arrays, select the array that you want to rebuild.
3. Press the **Ctrl+R** keys to begin the rebuild process.

## Verifying drives



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**NOTE:** The Verify Drives menu option is not available if the array has failed.

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If you are notified of a data mismatch during RAID 1 array creation by a Build operation, you can verify the drives to determine a possible cause of the mismatch.

To verify the drives:

1. From the main menu of the array configuration utility, select **Verify Drives**.
2. Select the drives that you want to verify.
3. Press the **Ctrl+S** keys.

When the Verify Drives operation is complete, you are notified of any errors found.