



Intel[®] RAID Technology

OEM Customization Technical Guide

For the Intel[®] Application Accelerator 4.1 Software using Intel[®] ICH6R

October 2003

Revision 3.0

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Revision History

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3.0	Initial Release Version	October 2003



1 **About This Document**

This document was prepared to assist customers in evaluating, testing, configuring, and delivering RAID on platforms using the Intel® ICH6R SATA RAID controller, Intel® ICH6R SATA AHCI Controller, or Intel® ICH6R SATA RAID controller and using the *Intel® Application Accelerator 4.1* software. This document describes installation procedures, common usage models, and any special notes necessary to enable customers to make a timely and competitive delivery of this product.



2 Intel® RAID Technology

Intel is delivering a RAID solution for the Microsoft Windows* XP and Microsoft Windows* 2000 operating system with the Grantsdale and Alderwood series core-logic chipsets. This RAID solution supports RAID level 0 (striping), RAID level 1 (mirroring), and a combination of the two by having two volume in a single RAID array using Intel® Matrix RAID Technology, and is targeted for availability on systems using ICH6R. Targeted for desktops and workstations, this RAID solution addresses the high demand from PC enthusiasts, high-end gamers, tech zealots, and other users requiring high-performance platforms. RAID 0 breaks the data into blocks which are written to separate hard drives. Spreading the hard drive I/O load across independent channels greatly improves I/O performance. RAID 1 provides data redundancy by mirroring data between the hard drives and provides enhanced read performance. The RAID configuration is transparent to Windows; the RAID volume appears as a single physical hard drive.

Note: The RAID 0 volume appears as a single physical hard drive with a capacity equal to twice the size of the smaller hard drive. The RAID 1 volume appears as a single physical hard drive with a capacity equal to that of the smaller hard drive.

The increasing requirements for performance in desktop platforms, combined with increasing price pressures make RAID solutions extremely attractive to both system integrators and end-users. The Intel RAID Technology solution offers data striping for higher performance and data mirroring for data redundancy (RAID 0 and RAID 1, respectively). This alleviates hard drive bottleneck by taking advantage of the dual independent Serial ATA150 controllers integrated into the Intel® ICH5R. System integrators can offer these features to their customers through the use of only two hard drives and no loss of PCI resources (request/grant pair) or add-in card slot. Intel's RAID 0 solution provides end-users the performance necessary for any disk-intensive applications; these include video production and editing, image editing, and gaming applications. Intel's RAID 1 solution provides end-users with data redundancy by mirroring data between the hard drives.

The Intel RAID Technology solution offers a very simple design, eliminating the need for any add-in card, discrete controller, or dedicated HDD for the operating system. RAID is the perfect complement for Intel's 2003 performance core-logic chipsets.

The Intel RAID Technology product is comprised of the following three core components:

- Intel® ICH6R I/O Controller Hub (ICH6R)
- Intel® Application Accelerator 4.1 software
- Intel® Application Accelerator RAID Option ROM

3 **Intel® Application Accelerator 4.1**

The *Intel® Application Accelerator 4.1* is the major software component needed for supporting Intel RAID Technology. It will provide a RAID driver for support under Windows XP or Windows 2000 operating systems and Intel® Storage Utility (a Win32 application). The RAID driver is designed specifically to support the Intel® ICH6R SATA RAID controller and will recognize its unique device ID and sub-class code. Because of this, it must be present in order to install the Windows operating system onto a RAID 0 or RAID 1 volume or onto a single SATA hard drive connected to the RAID controller. The RAID driver, in conjunction with the *Intel® Application Accelerator RAID Option ROM*, will provide seamless boot support for a two drive RAID 0 solution. The RAID driver, in conjunction with the Intel® Storage Utility, will provide RAID volume management (create, delete, migrate) from within the Windows operating system. It will also display useful SATA device and RAID volume information.



4 **Intel® Application Accelerator RAID Option ROM**

The *Intel Application Accelerator RAID Option ROM* is a standard PnP option ROM that adds the Int13h services and provides a pre-OS user interface for the Intel® RAID Technology solution. The Int13h services provide the ability for a RAID volume to be used as a boot hard drive. They also detect any faults in the RAID volume being managed by the RAID controller. The RAID Option ROM's Int13h services are used up to the point where the Intel RAID driver takes over. The *Intel Application Accelerator RAID Option ROM* expects a BIOS Boot Specification (BBS) compliant BIOS. It exports multiple PnP headers for each non-RAID hard drive or RAID volume, allowing boot order to be selected from within the BIOS's setup utility. When the system BIOS detects the RAID controller, the *RAID Option ROM* should be executed. The user interface integrated into the *Intel Application Accelerator RAID Option ROM* provides the basic functionality needed to create and delete RAID volumes in a pre-OS environment. This provides the ability for the OS to be installed directly onto the volume.

The *Intel Application Accelerator RAID Option ROM* is delivered as a single uncompressed binary image compiled for the 16-bit real mode environment. To conserve system flash space, the integrator may compress the image for inclusion into the BIOS. The uncompressed Option ROM image will be less than 64 KB in size. The run-time image that resides in BIOS compatibility space will reduce to less than 20 KB in size and consume no more than 12 KB of system memory. System memory is taken from conventional DOS memory and is not returned.

5 Intel RAID Configuration Utility

The Intel RAID Configuration utility is a 16bit DOS executable with capabilities similar to the *Intel Application Accelerator RAID Option ROM*. Its sole purpose is to provide customers with the ability to create, delete, and manage RAID volumes on a system within a DOS environment. For ease of use, the utility supports a set of command line parameters that make it possible to perform these functions without user interaction through the use of DOS scripts or shell commands.

The RAID Configuration utility has two main modes. The first one is through the use of command line parameters. Below is a screen shot of the help text displayed when using the -? flag. It shows the usage for all supported command line flags necessary for creating, deleting, and managing RAID volumes.

The second mode of operation is console mode. If this utility is executed without any command line flags, a console interface identical to that of the *Intel Application Accelerator RAID Option ROM* is presented and is fully functional within the DOS environment. The mode requires user interaction; however, it may be used to create, delete, and manage RAID volumes from a DOS environment when the *Intel Application Accelerator RAID Option ROM* is unavailable.

The usage for the Intel RAID Configuration Utility is below.

```
RaidCfg.exe [/?] [/Y] [/Q] [/C:vol_name] [/SS:strip_size] [/L:raid_level]
[/S:vol_size] [/DS:disk_ports] [/D:vol_name] [/X] [/I] [/P] [/OR] [/ST]
[/CS:file_name]

/? Displays Help Screen. Other options ignored.
/Y Suppress any user input. Used with options /C, /D, /X, & /F
  Should not be specified with /OR or /ST
/Q Quiet mode / No output. Should not be used with /I, /OR, or /ST
  COMMANDS - Only one at a time. Specifying no Command enters UI
/C Create a volume with the specified name.
  /S, /DS, /SS, & /L can be specified along with /C.
/SS Specify strip size in KB. Only valid with /C
/L Specify RAID Level (0 or 1). Only valid with /C
/S Specify volume size. Only valid with /C
/DS Selects the disks to be used in the creation of volume.
  List should be delimited by spaces.
/D Delete Volume with specified name.
/X Remove all metadata from all disks. Use with /DS to delete
  metadata from selected disks.
/I Display All Drive/Volume/Array Information. /P can be specified.
/P Pause display between sections. Only valid with /I.
/OR Run the status/UI same as the OROM.
/ST Display Volume/RAID/Disk Status. /CS can be specified to capture.
/CS Captures the screen to file from screen buffer. Only valid with /ST
```

6 Common RAID Setup Procedures

6.1 Build a SATA RAID 0 or RAID 1 System

This is the most common setup. This configuration will have the operating system striped for RAID 0, or mirrored for RAID 1, across two SATA hard drives. This would be a configuration commonly shipped by a system vendor. To prepare for this, you will need to have the Intel RAID driver on a floppy disk. See the procedure for creating this floppy in section 11.3 of this document.

1. Assemble the system using a motherboard that supports Intel® RAID Technology and attach two SATA hard drives.
2. Enter System BIOS Setup; ensure that Intel RAID Technology is enabled. This setting may be different for each motherboard manufacturer. Consult your users manual if necessary. When done, exit Setup.
3. Upon re-boot you will see the Option ROM status message on the screen – press CTRL-I to enter the Intel Application Accelerator RAID Option ROM user interface. Within this UI, select option #1 ‘Create RAID volume. Enter a volume name, press enter, select RAID level (0 or 1), press enter; press enter again to select the hard drives to be used, press enter, if RAID 0 was selected, select the strip size (128 KB is the default for RAID 0), (if RAID 1 is selected, the strip size will be inapplicable and will be skipped), press enter, select the size of volume (the default value will be the maximum size, if you select a smaller size, you will be able to create a second volume in the remaining space), press enter again, then press ‘Y’ to confirm. Once this is done, exit the Intel Application Accelerator RAID Option ROM user interface.

Note: Selecting the stripe size is only applicable for RAID 0.

4. Begin Windows XP or Windows 2000 Setup by booting from the installation CD.
5. At the beginning of Windows Setup, press F6 to install a third-party SCSI or RAID driver. When prompted, insert a floppy disk containing the Intel RAID driver. After reading the floppy disk, the ‘Intel® ICH6R SATA RAID Controller’ will be presented -- select this driver to install.
6. Finish the Windows installation and install all necessary drivers.
7. Install the *Intel® Application Accelerator 4.1* software via the CD-ROM included with your motherboard or after downloading it from the Internet. This will add the *Intel Storage Utility* that can be used to manage the RAID configuration.

6.2 Build a SATA “RAID Ready” System

The following steps outline how to build an Intel “RAID Ready” system with Windows XP or Windows 2000 installed on a single SATA hard drive. A “RAID Ready” system can be seamlessly upgraded to RAID 0 or RAID 1 at a later date using the RAID migration feature built into Intel Application Accelerator 4.1. This technology enables you to install a second SATA

hard drive, and then migrate to a RAID 0 or RAID 1 volume without re-installing the operating system.

1. Assemble the system using a motherboard that supports Intel RAID Technology and attach one SATA hard drive.
2. Enter System BIOS Setup; ensure that Intel RAID Technology is enabled. This setting may be different for each motherboard manufacturer. Consult your user manual if necessary. When done, exit Setup.
3. Begin Windows Setup by booting from the installation CD.
4. At the beginning of Windows Setup, press F6 to install a third-party SCSI or RAID driver. When prompted, insert a floppy disk containing the Intel RAID driver. After reading the floppy disk, the 'Intel® ICH6R SATA RAID Controller will be presented -- select this driver to install.
5. Finish the Windows installation and install all necessary drivers.
6. Install the *Intel® Application Accelerator 4.1* software via the CD-ROM included with your motherboard or after downloading it from the Internet. This will add the *Intel Storage Utility* that can be used to manage the RAID configuration and to use the Intel Application Accelerator migration feature to migrate a "RAID Ready" configuration to a RAID 0 or RAID 1 configuration.

6.3 Migrate to RAID 0 or RAID 1 on Existing "RAID Ready" System

If you have an existing "RAID Ready" system as defined in section 6.2, then you can use the following steps to perform a migration from a single non-RAID configuration to a two drive RAID 0 or RAID 1 configuration. The resulting configuration will be identical to that created by the procedure in section 6.1. To prepare for this, you will need another SATA hard drive with a capacity equal to or greater than that currently being used as the source hard drive.

1. Physically attach one SATA hard drive to the SATA port not being used. Note the serial number of the hard drive already in the system; you will use this to select it as the source hard drive when initiating the migration.
2. Boot Windows, install the Intel Application Accelerator software, if not already installed, using the setup package obtained from a CD-ROM or from the Internet. This will install the necessary Intel® Storage Utility and start menu links.
3. Open the Intel Storage Utility from the Start Menu and select 'Create RAID volume from Existing Hard Drive' from the Actions menu. This will activate the Create RAID volume from Existing Hard Drive Wizard. Click through the dialogs as prompted. It's important to understand what will occur during the migration process because any data on the destination hard drive will be lost.
4. Once the migration is complete, reboot the system. If you migrated to a RAID 0 volume, use Disk Management from within Windows in order to partition and format the empty space created when the two hard drive capacities are combined. You may also use third-party software to extend any existing partitions within the RAID volume.



6.4 Migrate an Existing Data Hard drive to a RAID 0 or RAID 1 Volume

When you are booting from a PATA drive containing the operating system, you may use the Intel Storage Utility to create a RAID 0 or RAID 1 volume on two SATA drives. Furthermore, if you have a SATA hard drive that contains program or personal data, you may use the migration feature to use this hard drive as the source hard drive for a migration. After the migration completes, you will have a two hard drive RAID 0 volume where data is striped or a two hard drive RAID 1 volume where the data is mirrored across the two SATA hard drives. To do this, the ICH6R SATA RAID controller will have to be enabled in BIOS and you will need to have the Intel® Application Accelerator software installed.

Begin with a system where you are booting Windows XP or Windows 2000 from a PATA hard drive. Make sure the ICH6R SATA RAID controller is enabled and the Intel® Application Accelerator software is installed. Then do the following:

1. Physically attach one SATA hard drive to the SATA port not being used. Note the serial number of the hard drive already in the system. You will use this to select it as the source hard drive when initiating the migration.
2. Boot to Windows, install the Intel Application Accelerator software, if not already installed, using the setup package obtained from a CD-ROM or from the Internet. This will install the necessary Intel Storage Utility and start menu links.
3. Open the Intel Storage Utility from the Start Menu. Select 'Create RAID volume from Existing Hard Drive' from the Actions menu. This will activate the Create RAID volume from Existing Hard Drive Wizard. Click through the dialogs as prompted. It's important to understand what will occur during the migration process because any data on the destination hard drive will be lost.
4. Once the migration is complete, reboot the system.

6.5 Create a RAID volume on SATA While Booting to PATA

This configuration is intended for users who would like to use a RAID 0 volume as a high performance data hard drive or use the data redundancy properties of RAID 1. Starting with a configuration where the system is booting to a Windows XP or Windows 2000 operating system, installation on a Parallel ATA hard drive, the user can add two SATA hard drives and create a RAID volume on them.

1. Physically install two SATA hard drives to the system.
2. Enter System BIOS Setup; ensure that Intel RAID Technology is enabled. This setting may be different for each motherboard manufacturer. Consult your user manual if necessary. When done, exit Setup.
3. Boot to Windows; install the Intel® Application Accelerator software, if not already installed, use the setup package obtained from a CD-ROM or from the Internet. This will install the necessary Intel Storage Utility and start menu links.
4. Use the Intel Storage Utility to create a RAID 0 volume on two SATA drives according to the procedure in section 7.1 of this document.

5. After the RAID volume is created, you will need to use Windows Disk Management or other third-party software to create a partition within the RAID volume and format the partition. At this point, you may begin to copy files to, or install software on, the RAID volume.

6.6 Build a RAID 0 or RAID 1 System in an Automated Factory Environment

This procedure consists of two steps. The first is to create the master image of a Windows installation. This should be the master image you would like pre-loaded on your systems to be pre-loaded with before they are delivered to the customer. The second step is to apply this image to a system with two SATA hard drives installed with a RAID 0 or RAID 1 volume present. This procedure will apply the image to the RAID volume so that the system may boot from it and the operating system will be fully striped by the RAID 0 volume or mirrored by the RAID 1 volume. The same procedure, and master image, could be applied to a single SATA hard drive to create a “RAID Ready” system.

6.6.1 Step 1: Create the Master Image

1. Build a RAID 0 or RAID 1 System as described in section 8.1 of this document.
2. Install the *Intel® Application Accelerator 4.1* software via the CD-ROM included with your motherboard or after downloading it from the Internet. This will add the *Intel Storage Utility* that can be used to manage the RAID configuration in Windows*.
3. Use third-party software to create an image of the RAID volume as if it were a physical hard drive or create an image of the partition within the RAID volume containing the operating system, program and data files. Store it in a place where it can be accessed by systems on the assembly line.

6.6.2 Step 2: Apply the Master Image

1. Assemble the system using a motherboard that supports Intel® RAID Technology and attach two SATA hard drives.
2. Enter System BIOS Setup; ensure that Intel RAID Technology is enabled. This setting may be different for each motherboard manufacturer. Consult your user manual if necessary. When done, exit Setup.
3. Within a DOS environment, use the Intel RAID Configuration Utility (RAIDcfg.exe) to create a RAID volume. The following command line will instruct the utility to create a RAID 0 volume named “OEMRAID0” on the hard drives on Port 0 and 1 with a strip size of 128 KB and a size of 120GB:

```
C:\>raidcfg.exe /C:OEMRAID0 /DS:0,1 /SS:128 /L:0 /S:120
```

The following command line will display all supported command line parameters and their usage:

```
C:\>raidcfg.exe /?
```

NOTE: The system does not need to be rebooted before moving on to the next step. If there are no PATA hard drives in the system, the RAID volume created will become the boot device upon reboot.



4. Use third-party software to apply the image created in Step 1 to the RAID volume.

7 Creating a RAID Volume

RAID volumes can be created three different ways. The one most widely used by end-users is to use the Intel Storage Utility in Windows*. The second method to create a RAID volume would be to use the Intel Application Accelerator RAID Option ROM user interface. The third way, used by OEMs only, is using the RAID Configuration Utility (RAIDcfg.exe).

7.1 Using the Intel Storage Utility

1. Run the Intel Storage Utility from the following Start menu link within Windows XP or Windows 2000:
2. Start→Programs→Intel Application Accelerator→Intel Application Accelerator
3. Select 'Create RAID Volume' from the Actions menu. This will launch the Create RAID Volume Wizard. Click through the dialogs as prompted. It's important to understand what will occur during the migration process because any data on the destination hard drive will be lost.
4. Once the RAID volume is created, you will be presented with a dialog stating that the RAID volume was successfully created. Click OK to close this dialog.
5. After the RAID volume is created, you will need to use Windows Disk Management or other third-party software to create a partition within the RAID volume and format the partition. At this point, you may begin to copy files to, or install software on, the RAID volume.

7.2 Using the RAID Option ROM User Interface

1. Upon re-boot, you will see the Option ROM status message on the screen – press CTRL-I to enter the Intel Application Accelerator RAID Option ROM user interface.
2. In the Main Menu, select option #1 'Create RAID Volume'. Enter a name you wish to use for the RAID volume, press enter when done.
3. Select the RAID level using the arrow keys, press enter when done.
4. Press enter to select the disks to be used by the array that the volume will be created on. Press enter when done.
5. Select the strip size (128 KB is the default for RAID 0) using the arrow keys, press enter when selected done.
6. Enter the size for the RAID volume in Gigabytes. By default, the maximum size that the volume can be will be shown. If you modify this field and make it smaller than the maximum size, there will be remaining array space on which you can create a second RAID volume using this same procedure.
7. Once this is done, exit the Option ROM user interface.



7.3 Using the RAID Configuration Utility

1. Within a DOS environment, run RAIDcfg.exe with the following command line flags to create a RAID volume.

The following command line will instruct the utility to create a RAID 0 volume named "OEMRAID0" on the hard drives on Port 0 and 1 with a strip size of 128 KB and a size of 120GB:

```
C:\>raidcfg.exe /C:OEMRAID0 /DS:0 1 /SS:128 /L:0 /S:120
```

The following command will create a RAID volume using all of the default values. It will create a RAID 0 volume with a strip size of 128KB on the only two hard drives in the system. The volume will be the maximum size allowable.

```
C:\>raidcfg.exe /C:OEMRAID0
```

The following command line will display usage for all support command line parameters:

```
C:\>raidcfg.exe /?
```

Note: Selecting the strip size is only applicable for RAID 0, and **not** for RAID 1.

8 Deleting a RAID Volume

RAID volumes can be deleted in three different ways. The method most widely used by end-users is the Windows user interface utility. The second method would be to use the Intel Application Accelerator RAID Option ROM user interface. The third way, used by OEMs only, is using the RAID Configuration Utility (RAIDcfg.exe).

8.1 Using the Windows* User Interface Utility

1. Run the Intel Storage Utility from the following Start menu link within Windows XP or Windows 2000:

Start→Programs→Intel Application Accelerator→Intel Application Accelerator
2. Right-click the RAID volume and select 'Delete Volume'
3. You will be presented with two confirmation dialogs. The first one will explain that all the data in the RAID volume will be lost. Click Yes to continue. The second dialog will again confirm the deletion of the RAID volume. Click Yes to continue.

8.2 Using the RAID Option ROM User Interface

1. Upon re-boot, you will see the Intel RAID BIOS status message on the screen – press CTRL-I to enter the Intel Application Accelerator RAID Option ROM user interface.
2. Within this UI, select option #2 'Delete RAID volume'.
3. You should be presented with another screen listing the existing RAID volume. Select the RAID volume you wish to delete using the up and down arrow keys. Press the Delete key to delete the RAID volume
4. Click Y to confirm.

Note: Option #3 "Reset Hard Drives to Non-RAID" may also be used to delete a RAID volume. This mechanism is provided as a way to reset one or more SATA hard drives to non-RAID status, essentially deleting all metadata on the hard drives. This has the affect of deleting any RAID volumes present. This function is provided for re-setting the hard drives when there is a mismatch in RAID volume information on the hard drives, and Option #2 cannot be used.



8.3 Using the RAID Configuration Utility

1. Within a DOS environment, run RAIDcfg.exe with the following command line flag to delete a RAID volume. The following command line will instruct the utility to delete a RAID 0 volume named "OEMRAID0"

```
C:\>raidcfg.exe /D:OEMRAID0
```

The following command line will display usage for all support command line parameters:

```
C:\>raidcfg.exe /?
```



9 Pre-Installation of the Intel® Application Accelerator Driver

Installation of Windows XP or Windows 2000 on a RAID volume or when in AHCI mode will require that the Intel Application Accelerator driver be pre-installed. An AHCI or RAID configuration would require this type of installation.

9.1 Pre-Installation Using F6 Method

1. Most likely, when you start the installation of Windows, you will be presented with a message stating, "Setup could not determine the type of one or more mass storage devices installed in your system". If this is the case, then you are already in the right place and are ready to supply the driver. If this is not the case, then simply press F6 when prompted at the beginning of Windows setup.
2. Press the 'S' key to select 'Specify Additional Device'
3. At this point you should be prompted to insert a floppy drive containing the manufacturer-supplied driver into the A: drive. In this case, it should contain the driver which includes the driver binary (iastor.sys), the INF files (iastor.inf and iaAhci.inf), the .cat files (iaStor.cat and iaAhci.cat) and the txtsetup.oem file (txtsetup.oem). These should be in the root directory of the floppy. Insert this floppy and press ENTER.
4. A few seconds later, you should be presented with a list of available SCSI Adapters. It should list "Intel(R) ICH6 SATA RAID Controller" when the system is in RAID mode and "Intel(R) ICH6R SATA AHCI Controller" when the system is in AHCI mode. Select it and press ENTER.
5. The next screen should confirm that you have selected the Intel(r) RAID controller. Press ENTER again to continue.
6. At this point, you have successfully F6'ed in the IAA RAID driver, and Windows setup should continue. Leave the floppy disk in the floppy driver until the system reboots itself. Windows setup will need to copy the files from the floppy again after the RAID volume is formatted, and Windows setup starts copying files.

9.2 Unattended Installations of Microsoft Windows* XP

To install the driver as outlined in the Microsoft document, "Deployment Guide Automating Windows NT* Setup" use the supplied TXTSETUP.OEM file included in this package and insert the lines below into the UNATTEND.TXT file. This method is available for Microsoft Windows XP operating system. For Windows XP, the iaStor.inf, iaAhci.inf, iaStor.sys, iaStor.cat, iaAhci.cat, and Txtsetup.oem files need to be extracted. To extract these files, use the method described in section 11.3 of this document

For Microsoft Windows XP, insert the following text into the UNATTEND.TXT file:

For system in RAID mode:

```
[MassStorageDrivers]
```



```
"Intel(R) ICH6R SATA RAID Controller" = OEM  
  
[OEMBootFiles]  
  
iaStor.inf  
  
iaStor.sys  
  
iaStor.cat  
  
Txtsetup.oem
```

For systems in AHCI Mode:

```
[MassStorageDrivers]  
  
"Intel(R) ICH6R SATA AHCI Controller" = OEM  
  
[OEMBootFiles]  
  
iaAhci.inf  
  
iaStor.sys  
  
iaAhci.cat  
  
Txtsetup.oem
```

9.3 Creating a Floppy Disk Containing the Intel® RAID Driver

This procedure should be used to create a floppy disk containing the Intel Application Accelerator driver for use in installing the driver using the F6 method described in section 9.1.

1. On a system running Windows, download the Intel Application Accelerator package or obtain it from your Intel representative.
2. Insert a blank, formatted floppy disk onto the a: drive.
3. Unpack the individual driver files using the following command line flags. There are several package types as follows: English only executable (iata_enu.exe), multi-language executable (iata_cd.exe), English only zip package (iata_enu.zip), and multi-language executable (iata_cd.zip).

```
C:\>setup.exe -a -p c:\IAAdriver
```

Used for setup.exe within the English only and multi-language .zip files)

```
C:\>iata_enu.exe -a -a -p c:\IAAdriver
```

```
C:\>iata_cd.exe -a -a -p c:\IAAdriver
```



Driver

**Where `c:\IAADriver` is an already existing folder on the c: drive

4. Once this is done, copy the driver binaries (`iastor.sys`), the INF files (`iastor.inf` and `iaAhci.inf`), the .cat files (`iaStor.cat` and `iaAhci.cat`) and the `txtsetup.oem` file (`txtsetup.oem`) from `c:\IAADriver\Driver` to the root directory of the floppy.



10 Determining the Software Versions of the Components

10.1 Determining the Version of the RAID Driver

There are two ways to do this. The first is to use the Intel Storage Utility. It reports the current version of the driver installed. The second is to locate the driver (iaStor.sys) itself and view its properties.

10.1.1 Using the Intel Storage Utility

1. Run the Intel Storage Utility from the following Start Menu path:
Start→All Programs→Intel Application Accelerator→Intel Application Accelerator
2. Select 'System Report' from the View menu.
3. Look for a parameter in the Parameters list box entitled "Driver Version". It should have a number in the following format:
4.1.0.xxxx
4. This is the current version of the user interface utility installed on your system. The 4.1.0 portion is the product release number; the xxxx portion is the build number.

10.1.2 Using the Intel Application Accelerator Driver File Properties

1. Locate the file "iaStor.sys" within the following path:
<System Root>\Windows\System32\Drivers
2. Right Click on "iaStor.sys" and select Properties
3. Select the "Version" tab
4. Located at the top of this tab's view should be a parameter called "File version". Next to it is the driver currently installed on your system. It should have the same format and version obtained using the method above.

10.2 Determining the Version of the Option ROM

There is only one way to determine the version of the Intel Application Accelerator RAID Option ROM integrated into the system BIOS. Use the following procedure to determine the version.



1. Early in system boot-up, during post, or when you see the “Intel(R) RAID for Serial ATA” status screen output, type CTRL-I. This will open the Option ROM user interface.
2. Located in the top right corner you should see a number in the following format:
V4.1.0.xxxx
3. This is the version of the Intel Application Accelerator RAID Option ROM currently installed on your system. The 4.1.0 portion is the product release number; the xxxx portion is the build number.

11 Un-installation

Un-installation of the RAID driver could potentially cause an end-user to lose access to important data within a RAID volume. This is because it's the only driver that can provide functionality for the ICH6R SATA RAID controller. Therefore, Intel does not provide a way to permanently remove it from the system. However, there are steps for disabling the SATA RAID Controller thereby causing the operating system to simply not use the RAID driver. The un-installation application that is provided when installing the Intel Application Accelerator software via the installer package does provide a means of removing all components except the RAID driver (i.e. UI application, Start Menu links, Control Panel Applet, etc.). Use the following procedures to remove the Intel Application Accelerator software or to disable the SATA RAID controller:

11.1 Uninstalling the Intel® Application Accelerator Software Except the RAID Driver

1. Run the Uninstall program from the following start menu link:
Start→Programs→Intel Application Accelerator→Uninstall
2. The first dialog that appears gives you the option of un-installing all components of the Intel Application Accelerator software except the RAID driver. Click OK to do so.
3. The next dialog is simply a confirmation that you would like to un-install all components of the software except the driver. Click Yes to confirm.
4. At this point, all components of the software will be un-installed except the RAID driver. You should no longer see start menu links to the UI application or a control panel applet for IAA. However, the RAID configuration should still function normally.

11.2 Disabling the use of the RAID Driver by Disabling the RAID Controller

1. Enter System BIOS Setup and disable Intel RAID Technology. This setting may be different for each motherboard manufacturer. Consult your user manual if necessary. When done, exit Setup.
2. Reboot the system. You should no longer see the RAID Option ROM status screen during boot, and you should no longer see the ICH6R SATA RAID controller in device manager.
3. At this point, Windows will no longer be using the RAID driver and you will not have Intel RAID functionality. Any data contained in existing RAID volumes will no longer be accessible. To re-enable Intel RAID functionality, re-enter System BIOS Setup and re-enable Intel RAID Technology.



Uninstall Note: End-Users can use this same procedure to disable the SATA RAID Controller if necessary. In fact, the un-install program used in section 11.1 of this document will display a text file with a similar procedure. Simply run the Uninstall Program, click Cancel when presented with the first dialog, then click Yes at the second dialog to view the text document containing the procedure.

12 Registry Customizations

After installation of the Intel® Application Accelerator, the registry will contain keys to allow customization of several features. The registry key used to customize the Intel Application Accelerator is at the following path:

HKEY_LOCAL_MACHINE/SOFTWARE/Intel/Intel Application Accelerator

12.1 Tray Icon Configuration

The Intel Application Accelerator Tray Icon can be configured for the following behaviors:

12.1.1 User Notification Balloons

This value configures the tray icon balloons for the following behavior:

“RAIDNotificationIcon”=

0x0 – Disabled – In this mode, the tray icon will never be shown. The user will never receive notifications using balloons or dialogs.

0x1 – No SMART – In this mode, the tray icon only shows notification for RAID volume status changes and hard drive failures. SMART event notifications are not shown.

0x2 – Default – In this mode, the tray icon only appears when a balloon is presented or there is a migration or rebuild occurring. The mode shows all events.

0x3 – Persistent Tray Icon – In this mode, the tray icon will be show in the system tray at all times. No other functionality is affected.

12.1.2 User Notification Dialogs

This value configures popup dialogs with the following behavior:

“RAIDNotificationDialogs”=

0x0 – Disabled – this mode does not present any dialogs.

0x2 – Enabled All – this mode presents dialogs for all events.

13 Glossary

Term	Definition
ATA	Advanced Technology Attachment
BIOS	Basic Input / Output System
BOM	Bill Of Materials
CD	Compact Disc
Chipset	Term used to define a collection of integrated components required to make a PC function.
Hard drives	Physical hard drives attached to a RAID controller
DOS	Disk Operating System
GB	Giga-byte
HDD	Hard Drive
I/O	Input/Output
ICH	I/O Controller Hub
ICH5R	Intel® ICH6R I/O Controller Hub
IDE	Integrated Drive Electronics
INF	Information file (.inf) used by Microsoft operating systems that support the Plug&Play feature. When installing a driver, this file provides the OS needed information about driver filenames, driver components, and supported hardware.
Intel® Option ROM (OROM)	Standard PnP option ROM that provides a pre-operating system user interface for the Intel® RAID implementation.
MB	Mega-byte
Migration	Term used to describe the movement of data from one configuration or usage model to another.
OEM	Original Equipment Manufacturer
Option ROM	A code module built into the System BIOS that provides extended support for a particular piece of hardware. For this product, the Option ROM provides boot support for RAID 0 and RAID 1 volumes, and provides a user interface for configuring and managing RAID 0 and RAID 1 volumes.
OS	Operating System
PATA	Parallel ATA
PCI	Peripheral Components Interface
PFW	Package for the Web
PIO	Programmed Input Output
PnP	Plug and Play
Port 0	Term used to describe the point at which a SATA drive is physically connected to the SATA Controller. Port 0 is the first of two on ICH5(R) systems.



Term	Definition
Port 1	Term used to describe the point at which a SATA drive is physically connected to the SATA Controller. Port 1 is the second of two on ICH5(R) systems.
RAID	Redundant Array of Independent Disks
RAID 0	A RAID level where data is striped across multiple physical hard drives (aka striping)
RAID 1	A RAID level where data is mirrored between hard drives to provide data redundancy (aka mirroring)
RAID volume	A block of capacity allocated from a RAID Array and arranged into a RAID topology. Operating Systems typically interpret a RAID volume as a physical hard drive.
RAM	Random Access Memory. Usually refers to the system's main memory
ROM	Read Only Memory
SATA	Serial ATA
SCSI	Small Computer Systems Interface
SP#	Service Pack (number)
Strip	Grouping of data on a single physical hard drive within a RAID volume
Stripe	The sum of all strips in a horizontal axis across physical hard drives within a RAID volume
UI	user interface