Installing SATA Drivers on HP EliteBook Notebook PCs

Introduction

Purpose

This white paper provides instructions on how to successfully incorporate SATA drivers into a Windows XP installation on HP EliteBook Notebook PC models. The following guidelines provide procedures for adding SATA drivers to RIS (Remote Installation Service) installation points; adding SATA drivers to installation CDs; building an image and switching to SATA AHCI mode; using Sysprep with SATA in AHCI or NATIVE mode; and adding SATA drivers using WinPE.

Audience

This white paper is for use by HP personnel and customers.

Benefits of SATA

SATA Native Mode is a storage interface technology that provides up to 150MB/Sec transfer rate for disk traffic, and provides link power management with Intel® Application Accelerator drivers. Intel Matrix Storage Manager Driver provides support for the SATA Advanced Host Controller (AHCI) Interface.

System Requirements and Prerequisites

System requirements

Information regarding minimum hardware requirements for installing XP Professional is available at www.microsoft.com.

This document applies to all systems using Intel Matrix SATA AHCI Storage controllers.

System prerequisites

You will need the following items before installing SATA drivers:

- Microsoft Windows XP Professional Service Pack 2, Certificate of Authenticity and documentation.
- Necessary drivers, especially Intel SATA AHCI Controller Driver.
- Proper OS License for each PC

IMPORTANT:
Make sure you have the latest compatible version of Microsoft Windows XP drivers and enhancements. In addition, you must have a Microsoft OS license for each system on which you install Windows XP Professional.

Note:
You can also download HP drivers and utilities, including the most current available ROM for the platform, from the HP website www.hp.com.

Transitioning a Sysprep image from IDE to SATA

Where these guidelines are applicable

This section provides guidelines for customers who need to add SATA support to a sysprep image. Sysprep images with no SATA support will display a blue screen and reboot very quickly in an infinite loop. Adding SATA drivers to the image will allow XP to access the disk and finish booting.

Note:
PCI IDs for current HP desktop and workstation Intel SATA controllers are included in step 5. Although this whitepaper is intended to cover HP Notebook PCs, this section should also be applicable to HP desktop and workstation PCs.

Steps to add SATA support to the original image

1) Download and save the "Intel Matrix Storage Manager" softpaq that is available for your platform at www.hp.com.

2) Unpack all the files from the SoftPaq. Unpacking a Softpaq file uses this command line:
   - Sp#####.exe -e -f<path> -s

   - Where
     o SP####.exe is the Softpaq to unpack.
     o -e is a run time switch that overrides installation of the component inside the softpaq.
     o -f<Path> is a run time switch that overrides the default path set at build time.
     o -s instructs the package to unpack in silent mode skipping the welcome, license and directory screens.

   - Example: C:\tmp\sp99999.exe -e -fc:\sp99999 -s

   - This will unpack the files needed to c:\sp99999.

3) Browse to the location of the Intel storage drivers on your system. Using the example above that would be c:\sp99999\Winall\Driver (for XP32) or c:\sp99999\Winall\Driver64 (for XP64). Copy the files in that directory to removable media (i.e. floppy disk, usb key).

   a. iaahci.cat
   b. iaahci.inf
   c. iastor.cat
   d. iastor.inf
   e. iastor.sys
   f. txtsetup.oem

4) On the system you intend to Sysprep, add the first 5 files (a through e, from above) to the PnP drivers store (example: c:\drivers\sata).

5) Obtain the SATA Device ID as described in the section "How to Obtain SATA Device IDs" of this document and insert them where *[SATA Device ID]* is seen below. Add the following section to your c:\sysprep\sysprep.inf file:

```
[SysprepMassStorage]
[SATA Device ID] = %systemdrive%\drivers\sata\iaahci.inf   ;   [optional description]
[SATA Device ID]= %systemdrive%\drivers\sata\iastor.inf   ;   [optional description]
```

Please note that each line to be added starts with PCI\. These lines are continued over to a second row in this paper due to space limitations. In addition, the text displayed after the semicolon (;) is an example of optional text that can be used to identify which SATA Device ID is being inserted. This is entirely optional text which can be modified or completely removed at the customer's discretion.

6) Add or edit the following section of sysprep.inf to add the SATA drivers to the PnP drivers path.

```
[Unattended]
OemSkipEula=Yes
OemPnPDriversPath=drivers\sata;<your driver list will come
here>
ConfirmHardware=No
OverwriteOemFilesOnupgrade=No
DriverSigningPolicy = Ignore
oempreinstall=yes
updateInstalledDrivers=Yes
```

7) At this point, the Windows installation is ready for deployment. Run Sysprep on the updated OS, capture an image, and deploy the image to systems using SATA hardware set to the default AHCI SATA Native mode.

Adding SATA drivers to RIS Installation Points

Where these guidelines are applicable

IMPORTANT:
Follow the installation instructions in the order provided. Failure to complete these steps in the proper order can result in an unsuccessful or unstable installation.

This section provides guidelines for customers who need to add SATA support to a Remote Installation Service distribution point.

Steps to add SATA drivers to the distribution point

1) Download and save the "Intel Matrix Storage Manager" softpaq that is available for your platform at www.hp.com.

2) Unpack all the files from the SoftPaq. Unpacking a Softpaq file uses this command line:
   - Sp#####.exe -e -f<path> -s

   - Where
     - SP####.exe is the Softpaq to unpack.
     - -e is a run time switch that overrides installation of the component inside the softpaq.
     - -f<Path> is a run time switch that overrides the default path set at build time.
     - -s instructs the package to unpack in silent mode skipping the welcome, license and directory screens.

   - Example: C:\tmp\sp99999.exe -e -fc:\sp99999 -s

   - This will unpack the files needed to c:\sp99999.

3) Browse to the location of the Intel storage drivers on your system. Using the example above that would be c:\sp99999\Winall\Driver (for XP32) or c:\sp99999\Winall\Driver64 (for XP64). Copy the files in that directory to removable media (i.e. floppy disk, usbkey).

   a. iaahci.cat
   b. iaahci.inf
   c. iastor.cat
   d. iastor.inf
   e. iastor.sys
   f. txtsetup.oem

4) Copy all the files above to the following path on the distribution point (on the RIS server):
   `RemoteInstall\Setup\<Language>\Images\<Dir_name>\i386`

5) Also copy the same files (from step 3, above) to
   `RemoteInstall\Setup\<Language>\Images\<Dir_name>\$oem$\$1\drivers\sata`

6) Open `RemoteInstall\Setup\<Language>\Images\<Dir_name>\i386` `\txtsetup.sif` in Notepad.

7) Go to the end of the file. There will be several blank lines.

8) Move the cursor up a few lines. This is necessary because there is a hidden marker at the end of the file.

9) Add the following lines to the txtsetup.sif file. For the HardwareIdsDatabase, multiple device IDs can be added here using any of the SATA Device IDs obtained from the section of this document titled "How to Obtain SATA Device IDs". Simply replace the *[SATA Device IDs]* with the Device ID you received from the system. Only one is needed, but multiple IDs can be inserted for additional support of multiple SATA Device Controllers.

```
[SourceDisksFiles]
iastor.sys= 1,,,,,,,4_,4,1,,,1,4
iaAHCI.cat=1,,,,,,,20,0,0
iaAHCI.inf=1,,,,,,,20,0,0
iaSTOR.cat=1,,,,,,,20,0,0
iaSTOR.inf=1,,,,,,,20,0,0

[HardwareIdsDatabase]
[SATA Device ID1] = "iaStor"
[SATA Device ID2] = "iaStor"
[SATA Device ID3] = "iaStor"
[SATA Device ID4] = "iaStor"
[SATA Device ID...] = "iaStor"

[SCSI.Load]
iaStor = iaStor.sys,4

[SCSI]
iaStor = "Intel(R) 82801 SATA RAID/AHCI Controller
(ICH5,6,7)"
```

10) Save the file and exit notepad.

11) Open any other .sif file(s) in the path:
`RemoteInstall\Setup\<Language>\Images\<Dir_name>\i386\xxxx.sif` with notepad

12) In these files, under the section `[Unattended]`, add the following lines:
```
OemPreinstall=yes
OemPnPDriversPath=drivers\sata
DriverSigningPolicy = Ignore
```

13) Save all your edited .sif file(s), and close notepad
14) Restart the Remote Installation Service (binlsvc).

Adding SATA Drivers to an Installation CD

Where these guidelines are applicable

IMPORTANT:
Follow the installation instructions in the order provided. Failure to complete these steps in the proper order can result in an unsuccessful or unstable installation.

This section provides guidelines for customers who need to add SATA support by creating a custom Windows XP Service Pack 2 Installation CD.

Steps to add SATA drivers to the CD

1) Copy all the directories and files from the Windows XP CD to a temporary folder (these guidelines will use `c:\xpcd`)

2) Download and save the "Intel Matrix Storage Manager" softpaq that is available for your platform at www.hp.com.

3) Unpack all the files from the SoftPaq. Unpacking a Softpaq file uses this command line:
   - Sp#####.exe -e -f<path> -s

   - Where
     - o SP####.exe is the Softpaq to unpack.
     - o -e is a run time switch that overrides installation of the component inside the softpaq.
     - o -f<Path> is a run time switch that overrides the default path set at build time.
     - o -s instructs the package to unpack in silent mode skipping the welcome, license and directory screens.

   - Example: C:\tmp\sp99999.exe -e -fc:\sp99999 -s

   - This will unpack the files needed to c:\sp99999.

4) Browse to the location of the Intel storage drivers on your system. Using the example above that would be c:\sp99999\Winall\Driver (for XP32) or c:\sp99999\Winall\Driver64 (for XP64). Copy the files in that directory to removable media (i.e. floppy disk, usb key).

   a. iaahci.cat
   b. iaahci.inf
   c. iastor.cat
   d. iastor.inf
   e. iastor.sys
   f. txtsetup.oem

5) Create the following path in the temporary folder: `c:\xpcd\$oem$\$1\drivers\sata`

6) Copy all the files from step 4 to the `c:\xpcd\i386` folder.

7) Also copy all the files from step 4 to the `c:\xpcd\$oem$\$1\drivers\sata` folder.

8) Open the `c:\xpcd\i386\txtsetup.sif` file in Notepad.

9) Go to the end of the file. There will be several blank lines.

10) Move the cursor up a few lines. This is necessary because there is a hidden marker at the end of the file.

11) Add the following lines. For the HardwareIdsDatabase, multiple device IDs can be added here using any of the SATA Device IDs obtained from the section of this document titled "How to Obtain SATA Device IDs". Simply replace the *[SATA Device IDs]* with the Device ID you received from the system. Only one is needed, but multiple IDs can be inserted for additional support of multiple SATA Device Controllers.

```
[SourceDisksFiles]
iastor.sys= 1,,,,,,,4_,4,1,,,1,4
iaAHCI.cat=1,,,,,,,20,0,0
iaAHCI.inf=1,,,,,,,20,0,0
iaSTOR.cat=1,,,,,,,20,0,0
iaSTOR.inf=1,,,,,,,20,0,0

[HardwareIdsDatabase]
[SATA Device ID1] = "iaStor"
[SATA Device ID2] = "iaStor"
[SATA Device ID3] = "iaStor"
[SATA Device ID4] = "iaStor"
[SATA Device ID...] = "iaStor"

[SCSI.Load]
iaStor = iaStor.sys,4

[SCSI]
iaStor = "Intel(R) 82801 SATA RAID/AHCI Controller
(ICH5,6,7)"
```

12) Save the file and exit notepad.
13) Extract the files from `c:\xpcd\support\tools\deploy.cab` to `c:\deploytools`
14) Create a new `winnt.sif`:
   a. Execute setupmgr.exe (extracted from deploy.cab in step 13).
   b. Select "Create new answer file"
   c. Select "Unattended Setup"
   d. Select "Windows XP Pro"
   e. Select "User Interaction desired"
   f. Select "Set up from a CD"
   g. Enter desired information under each of the following Settings sections
   h. Save the file as `c:\xpcd\i386\winnt.sif`

15) Open the `c:\xpcd\i386\winnt.sif` in notepad

16) Under the section `[Unattended]`, add the following lines:
   ```
   OemPreinstall=yes
   OemPnPDriversPath=drivers\sata
   DriverSigningPolicy = Ignore
   ```

17) Save `winnt.sif` and close notepad

18) Burn the custom XPCD from the `c:\xpcd` folder.
   a. Note that the volume label of the CD **must** be the same as from the original XP CD
   b. The custom XPCD must be bootable (with the Microsoft bootblock). There are various 3rd party utilities which can accomplish this. Utilities from Microsoft are available, as detailed in the following section.

Using OSCDIMG (or CDIMAGE) and CDBURN (command line utilities from Microsoft)

Note: You will need the OSCDIMG and CDBURN utilities. OSCDIMG is found in the WinPE toolkit folder or the OPK. CDBURN is included in the Windows Resource Kits.

1) To create the .iso, use `oscdimg –l <your XP cd label> -b ETFSBOOT.COM –n c:\xpcd c:\xpcd.iso`

2) To create the CD, use Cdburn <cd-drive-letter:> c:\xpcd.iso

Adding SATA Drivers to WinPE 2005

Where these guidelines are applicable

IMPORTANT:
Follow the installation instructions in the order provided. Failure to complete these steps in the proper order can result in an unsuccessful or unstable installation.

This section provides guidelines for customers who need to add SATA support to a WinPE ISO or DOK.

Steps to add SATA drivers to WinPE 2005

1) Create the WinPE folder (these guidelines will use `c:\winpe`)

2) Download and save the "Intel Matrix Storage Manager" softpaq that is available for your platform at www.hp.com.

3) Unpack all the files from the SoftPaq. Unpacking a Softpaq file uses this command line:
   - Sp#####.exe -e -f<path> -s

   - Where
     - SP####.exe is the Softpaq to unpack.
     - -e is a run time switch that overrides installation of the component inside the softpaq.
     - -f<Path> is a run time switch that overrides the default path set at build time.
     - -s instructs the package to unpack in silent mode skipping the welcome, license and directory screens.

   - Example: C:\tmp\sp99999.exe -e -fc:\sp99999 -s

   - This will unpack the files needed to c:\sp99999.

4) Browse to the location of the Intel storage drivers on your system. Using the example above that would be c:\sp99999\Winall\Driver (for XP32) or c:\sp99999\Winall\Driver64 (for XP64). Copy the files in that directory to removable media (i.e. floppy disk, usbkey).

   a. iaahci.cat
   b. iaahci.inf
   c. iastor.cat
   d. iastor.inf
   e. iastor.sys
   f. txtsetup.oem

5) Copy the `iaahci.inf` and `iastor.inf` files from the floppy to the `c:\winpe\i386\inf` folder.

6) Copy the other files to the `c:\winpe\i386\system32\drivers` folder.

7) Open `c:\winpe\i386\txtsetup.sif` in Notepad.

8) Go to the end of the file. There will be several blank lines

9) Move the cursor up a few lines. This is necessary because there is a hidden marker at the end of the file.

10) Add the following lines to the `txtsetup.sif`. For the HardwareIdsDatabase, multiple device IDs can be added here using any of the SATA Device IDs obtained from the section of this document titled "How to Obtain SATA Device IDs". Simply replace the *[SATA Device IDs]* with the Device ID you received from the system. Only one is needed, but multiple IDs can be inserted for additional support of multiple SATA Device Controllers.

```
[SourceDisksFiles]
iastor.sys= 1,,,,,,,4_,4,1,,,1,4
iaAHCI.cat=1,,,,,,,20,0,0
iaAHCI.inf=1,,,,,,,20,0,0
iaSTOR.cat=1,,,,,,,20,0,0
iaSTOR.inf=1,,,,,,,20,0,0

[HardwareIdsDatabase]
[SATA Device ID1] = "iaStor"
[SATA Device ID2] = "iaStor"
[SATA Device ID3] = "iaStor"
[SATA Device ID4] = "iaStor"
[SATA Device ID...] = "iaStor"

[SCSI.Load]
iaStor = iaStor.sys,4

[SCSI]
iaStor = "Intel(R) 82801 SATA RAID/AHCI Controller
(ICH5,6,7)"
```

11) Save the file and exit Notepad.

12) Create the WinPE .ISO file or DOK from `c:\winpe.` This is done in the usual manner.

Modifying a Windows XP installation to support SATA Native Mode

Where these guidelines are applicable

IMPORTANT:
Follow the installation instructions in the order provided. Failure to complete these steps in the proper order can result in an unsuccessful or unstable installation.

This section provides guidelines for customers who have built an image with SATA AHCI Native Mode disabled in F10 Setup, and need to modify the image to support SATA AHCI Native Mode enabled (the default mode). This section is intended for customers who have not yet modified their overall process using one of the previous methods, and need an expedient method of imaging a system.

This section provides guidelines for disabling SATA native mode in F10 setup, building the image, adding the drivers for SATA AHCI to the image, and re-enabling SATA native mode in F10 setup.

Steps to modify a Windows XP image to support SATA Native Mode

1) Enter F10 Setup, and go to System Configuration/Device Configurations/SATA Native Mode to Disable.
2) Install Windows XP Service Pack 2 in whatever manner is typical for your organization.

3) Download and save the "Intel Matrix Storage Manager" softpaq that is available for your platform at www.hp.com.

4) Unpack all the files from the SoftPaq. Unpacking a Softpaq file uses this command line:
    - Sp#####.exe -e -f<path> -s

    - Where
        o SP####.exe is the Softpaq to unpack.
        o -e is a run time switch that overrides installation of the component inside the softpaq.
        o -f<Path> is a run time switch that overrides the default path set at build time.
        o -s instructs the package to unpack in silent mode skipping the welcome, license and directory screens.

    - Example: C:\tmp\sp99999.exe -e -fc:\sp99999 -s

    - This will unpack the files needed to c:\sp99999.

5) Browse to the location of the Intel storage drivers on your system. Using the example above that would be c:\sp99999\Winall\Driver (for XP32) or c:\sp99999\Winall\Driver64 (for XP64). Copy the files in that directory to removable media (i.e. floppy disk, usbkey).

    a. iaahci.cat
    b. iaahci.inf
    c. iastor.cat
    d. iastor.inf
    e. iastor.sys

      f.   txtsetup.oem

      a.

6) Download and run the "Intel Chipset Installation Utility for ICH9 for Microsoft Windows 2000 and XP" for your models from www.hp.com.

7) In Device Manager, right-click the IDE ATA/ATAPI controllers/Intel ® ICH9M Serial ATA Storage Controller and select 'Update Driver'. If more than one Intel ICH9M Serial ATA Storage Controller is listed this process only needs to be done once.

8) Follow these steps to complete the Hardware Update Wizard:
   a. At the first dialog, select 'No, not this time' when prompted to connect to Windows Update.
   b. At the next dialog, select 'Install from a list or specific location (Advanced).
   c. At the next dialog, select 'Don't search. I will choose the driver to install'.
   d. When prompted to select the device driver you want to install for this hardware, choose the first one in the list: Intel® ICH9M Serial ATA Storage Controller.
   e. When prompted to insert the manufacturer's installation disk, select "Have Disk" and when prompted, browse to the location of the "Intel Matrix Storage Manager" files extracted from the softpaq on your removable media.
   f. Select iaAHCI.inf and click Open, then OK.
   g. When prompted to select the device driver you want to install for this hardware, select the Intel® ICH9M-E/M SATA AHCI Controller.
   h. A warning that Windows cannot verify that the device is compatible with your hardware will appear. When asked if you want to continue installing the driver, select Yes, then Finish.
   i. The installation will complete.

9) Shut down Windows and restart the computer. Enter F10 setup when prompted during the boot.

10) Go to System Configuration/Device Configurations/SATA Native Mode and change it to Enable, then save settings and exit F10 Setup.

11) After Windows restarts, the additional SATA components will be updated. A System Settings Change will appear. When asked "Do you want to restart your computer now?" click Yes.

12) When Windows restarts, the SATA AHCI drivers will be completely installed.

How to Obtain SATA Device IDs

Where these guidelines are applicable

This section provides guidelines for customers who need the SATA Device ID from an HP system to enable SATA AHCI support in custom images. Steps are provided for both Windows XP and Windows Vista.
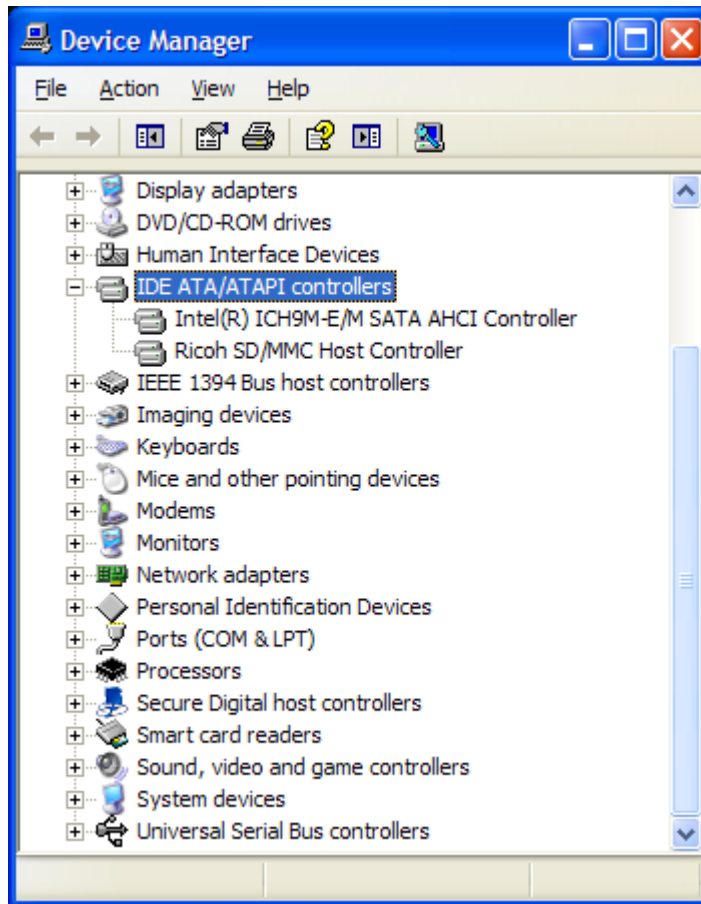
Steps to obtain the SATA Device ID from a Windows XP image

1) Begin by taking a Windows XP system with the HP image already on it. Turn on the system and boot into the Operating System.
2) Once the Operating System is loaded, select the Start Button and choose Run.
3) When the "Run" dialogue box appears, type the following command:
    devmgmt.msc
   Press the OK button to launch the Device Manager console. Refer to the screenshot below for this step.
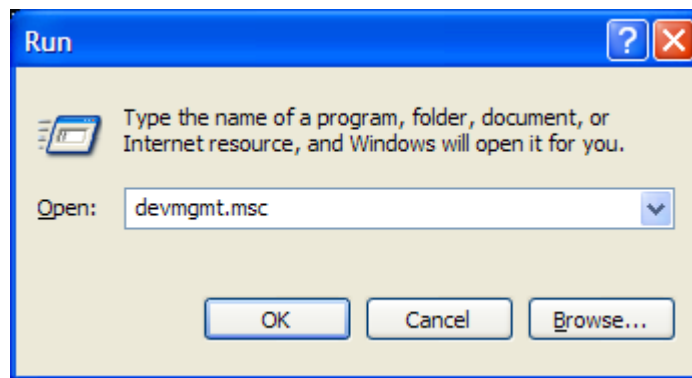
4) When the Device Manager Console opens, scroll down to locate & expand the category for IDE ATA/ATAPI controllers as seen in the screenshot below:

5) Double click on the listed SATA AHCI Controller to bring up the device's property window.

6) In the device property window, select the Details tab and choose "Hardware Ids" from the drop-down menu as seen in the screenshot below. The Device ID needed from the list is the one with the simple Class Code Hardware ID (identified with a "CC" string in the name). In
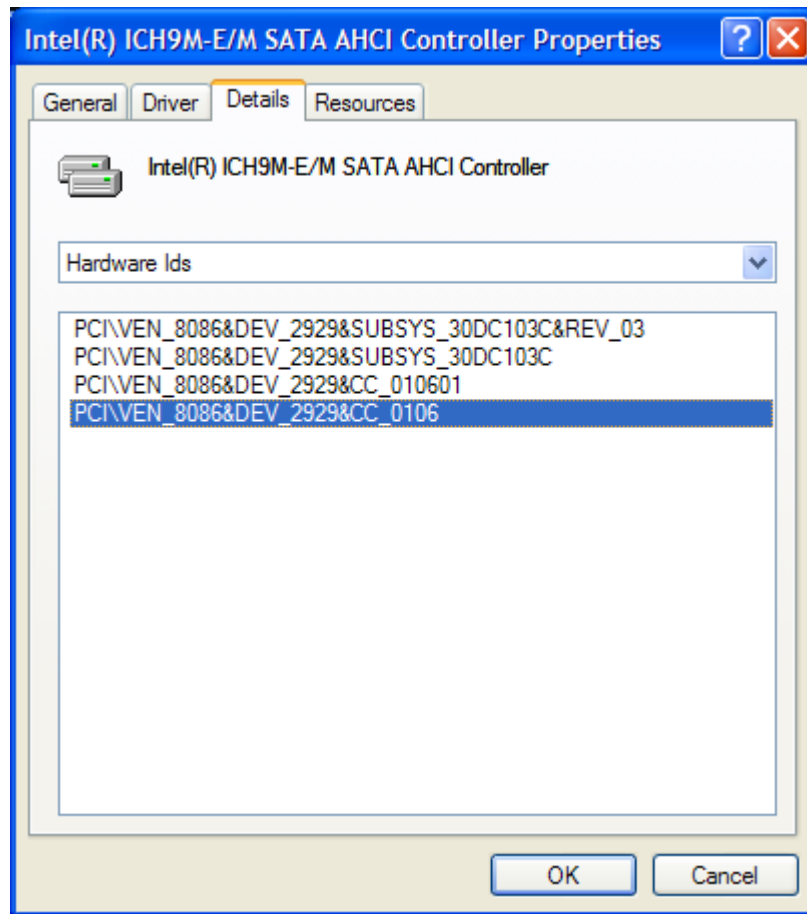

the example below, the Device ID needed is PCI\VEN_8086&DEV_2929&CC_0106.

Steps to obtain the SATA Device ID from a Windows Vista image

1) Begin by taking a Windows Vista system with the HP image already on it. Turn on the system and boot into the Operating System.

2) Once the Operating System is loaded, select the Start Button and type the following command:

        devmgmt.msc

Pressing the Enter key after typing the above command will launch the Device Manager console. Refer to the screenshot below for this step.
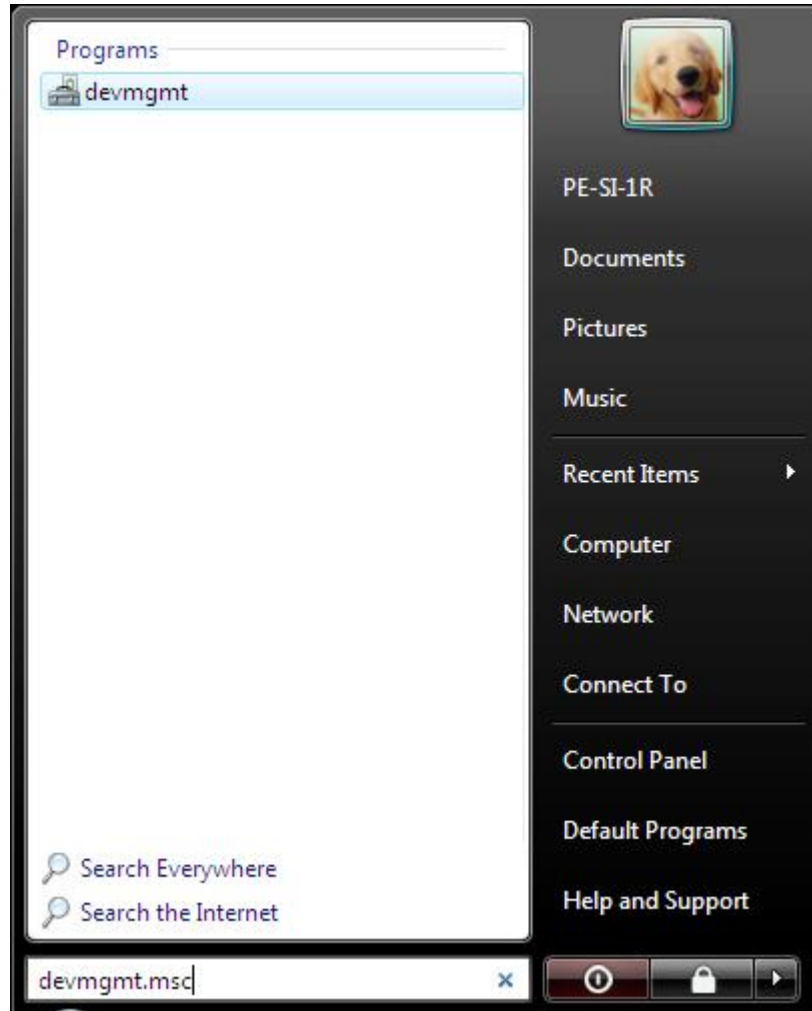
3) When the Device Manager Console opens, scroll down to locate & expand the category for IDE ATA/ATAPI controllers as seen in the screenshot below:
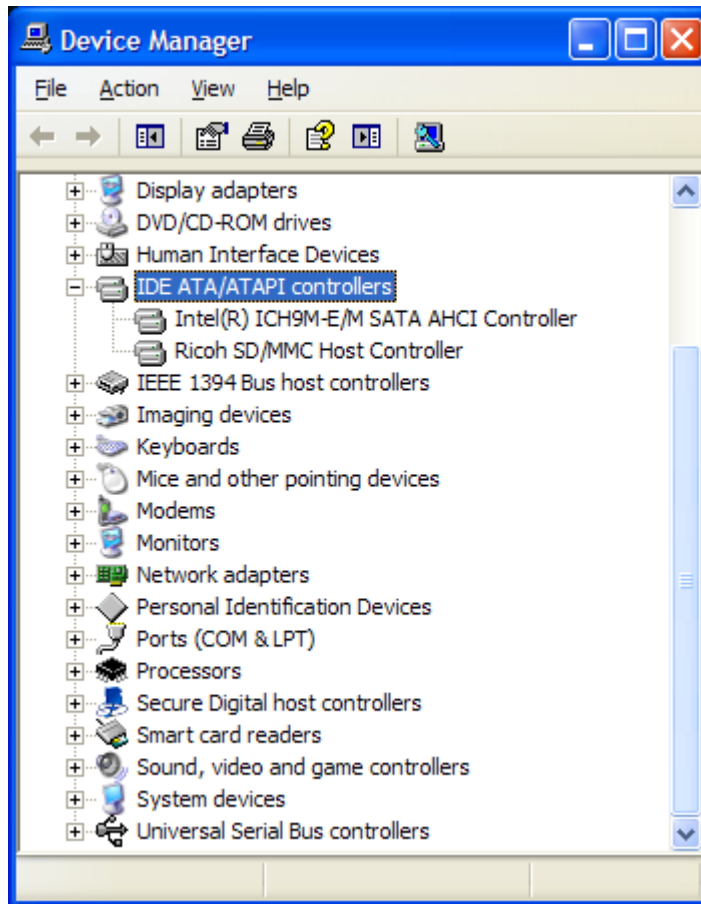
4) Double click on the listed SATA AHCI Controller to bring up the device's property window.

5) In the device property window, select the Details tab and choose "Hardware Ids" from the drop-down menu as seen in the screenshot below. The Device ID needed from the list is the one with the simple Class Code Hardware ID (identified with a "CC" string in the name). In the example below, the Device ID needed is PCI\VEN_8086&DEV_2929&CC_0106.
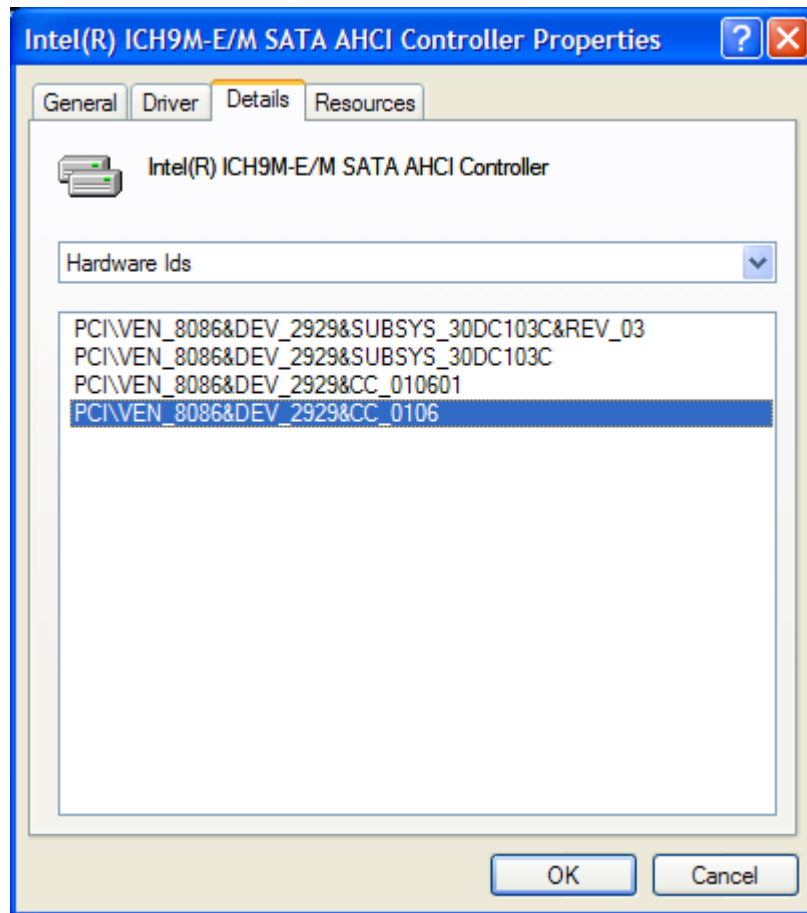
For more information

To learn more about HP business notebooks, contact your local HP sales representative or visit our Web site at: **www.hp.com/go/notebooks**.