

## **KT2101 Configuring device drivers**

### **Installing and Configuring Device Drivers**

Devices have changed from being single-function peripherals to complex, multifunction devices, with a large amount of local storage and the ability to run applications. They have evolved from a single type of connection, such as USB, to multi transport devices that support USB, Bluetooth, and WiFi.

Many of today's devices are often integrated and sold with services that are delivered over the Internet, Internet delivery has simplified the delivery mechanism, which means that a computer's ability to recognize and use devices has expanded to cover all possibilities. Microsoft has expanded the list of devices and peripherals that are being tested for compatibility with Windows 8.

The device experience in Windows 8 is designed on existing connectivity protocols and driver models to maximize compatibility with existing devices. The following are areas in Windows 8 that you can use to manage devices:

The Devices and Printers control panel gives users a single location to find and manage all the devices that connect to a Windows 8-based computer, and provides quick access to device status, product information, and key functions, such as Faxing and scanning. This enhances and simplifies the customer experience with a Windows 8-connected device.

Device Manager is used to view and update hardware settings and driver software for devices such as internal hard drives, disc drives, sound cards, video or graphics cards, memory, processors, and other internal computer components.

Seamless user experiences begin with the ability to effortlessly connect devices. Additional drivers are retrieved automatically from Windows Update, and when appropriate, users are given an option to download and install additional applications for the device. These components all help reduce support calls and increase customer satisfaction.

### **Device Drivers in Windows 8**

A driver is a small software program that the computer uses to communicate with hardware or devices. It also is specific to an operating system. Without drivers, the hardware that you connect to the computer does not work properly.

In most cases, drivers are part of windows, or you can locate them by navigating to Windows Update, and then checking for updates. If Windows does not have the required driver, look for it on the disc that came with the hardware or device, or on the manufacturer's website.

### **32-bit and 64-bit Drivers**

Windows 8 is available in 32-bit and 64-bit version. Drivers developed for the 32-bit versions do not work with the 64-bit versions, and vice versa. You must make sure that you obtain the appropriate device drivers before you install Windows 8.

### **Driver Signing**

The device drivers that are part of Windows 8 have a Microsoft digital signature that indicates whether a particular driver or file has met a certain level of testing, is stable and reliable, and has not been altered since it was signed digitally. Windows 8 checks for driver's digital signature during installation, and prompts the user if no signature is available.

**Note:**

The signature file is stored as a .cat file in the same location as the driver file.

**Driver Store and Driver Packages**

The driver store is the driver repository in Windows 8. A driver package is a set of files that make up a driver. It includes the .inf file, any files that the .inf file references, and the .cat file that contains the digital signature for the device driver. You can preload the driver store with drivers for commonly used peripheral devices. The driver store is located in **systemroot\System32\DriverStore**.

Installing a driver is a two-stage process. First, you install the driver package into the driver store. You must use administrator credentials to install the driver package into the driver store. The second step is to attach the device and install the driver. A standard user can perform this second step.

During hardware installation, if the appropriate driver is not available, Windows 8 uses Windows Error Reporting to report an unknown device. This enables Original Equipment Manufacturers (OEMs) to work in conjunction with Microsoft to provide additional information to the user, such as a statement of nonsupport for a particular device, or a link to a website with additional support information.

In Windows 8, the Device Metadata System provides an end-to-end process for defining and distributing device metadata packages. These packages contain device experience XML documents that represent the device's properties and functions, together with applications and services that support the device. Through these XML documents, the Devices and Printers folder and Device Stage present users with an interface that is specific to the device, which the device maker defined.

Windows Online Quality Services (Winqual) validates device-experience XML documents, and then signs device metadata packages. Windows Metadata and Internet Services (WMIS) distributes new or revised device-metadata packages that device makers submit through Winqual.

Windows 8 uses WMIS to discover, index, and match device metadata packages to specific devices that are connected to the computer. Device makers also can distribute device-metadata packages directly to the computer through their own Setup applications.

**KT2102 Changing device settings**

Device Manager displays a graphical view of the hardware that is installed on your computer. Use this tool when you want to view and manage hardware devices and their drivers. You must be logged on to the computer as an administrator or as a member of the Administrators group to add or remove devices or to configure device properties in Device Manager.

When you install a Plug and Play device, Windows automatically configures the device so that it works correctly with the other devices that are installed on the computer. During the configuration process,

Windows assigns a unique set of system resource settings to the device. The following list describes the four types of resources that a device can use:

Interrupt request (IRQ) line numbers

Direct memory access (DMA) channels

Input/output (I/O) port addresses

Memory address ranges

Each resource that is assigned to a device is given a unique value. Occasionally, a device conflict may occur if two devices require the same resources. If this conflict occurs, you can manually configure the device to assign unique resources to each device. In some situations, depending on the device drivers and the computer, two devices can share a resource (for example, interrupts on Peripheral Component Interconnect [PCI] devices).

When you install a non-Plug and Play device, Windows doesn't automatically configure resource settings for the device. Depending on the type of device, you may have to manually configure these settings. Before you do so, either contact the hardware manufacturer, or see the documentation that is included with the device for more information.

Typically, Windows identifies devices and their resource requests, and then automatically gives the resource settings for your hardware. In most situations, you don't have to modify resource settings for your hardware. Don't change resource settings for a Plug and Play device unless it's necessary. When you manually configure a resource, the setting is fixed. So Windows can't modify resource assignments if that is required, and Windows can't assign that resource to another device.

### How to configure a device in Device Manager

To configure a device in Device Manager, follow these steps.

#### Important

Use caution when you configure resource settings for a device. If you configure resources incorrectly, you can disable your hardware, and you can cause your computer to stop working. Change resource settings only when you are sure that the settings that you want to use are unique and don't conflict with settings for other devices, or when a hardware manufacturer has provided you with specific resource settings for a device.

Sign in to your computer as an administrator or as a member of the Administrators group.

Select **Start**, point to **Administrative Tools**, and then select **Computer Management**.

Under **System Tools** in the console tree, select **Device Manager**.

The devices that are installed on your computer are listed in the right pane.

Double-click the type of device that you want to configure--for example, **Ports (COM & LPT)**.

Right-click the device that you want to configure, and then select **Properties**.

Select the **Resources** tab.

Click to clear the **Use automatic settings** check box.

### Note

The **Use automatic settings** check box is unavailable and appears dimmed, both on devices for which there are no other settings to configure and on devices that are controlled by Plug and Play resources and which do not require user modification.

In the **Settings based on** box, select the hardware configuration that you want to modify--for example, **Basic configuration 0000**.

Under **Resource type** in the **Resource settings** box, select the type of resource that you want to modify--for example, **Interrupt Request**.

Select **Change Setting**.

In the **Edit Resource** dialog box, type the value that you want for the resource, and then select **OK**.

Repeat steps 8 through 11 to configure the resource settings that you want for the device.

Quit Device Manager.

### How to view resource settings in Device Manager

To view a list of resources and the devices that are using them by type or by connection, follow these steps:

Select **Start**, point to **Administrative Tools**, and then select **Computer Management**.

Under **System Tools** in the console tree, select **Device Manager**.

The devices that are installed on your computer are listed in the right pane. The default view lists devices by type.

Use one of the following methods:

To view a list of resources by type, select **Resources by type** on the **View** menu.

To view a list of resources by connection type, select **Resources by connection** on the **View** menu.

### Use Device Manager to search for device conflicts

A device conflict occurs when the same resources are given to two or more devices. Use Device Manager to search for device conflicts. To do so, follow these steps:

Select **Start**, point to **Administrative Tools**, and then select **Computer Management**.

Under **System Tools** in the console tree, select **Device Manager**.

The devices that are installed on your computer are listed in the right pane.

Double-click the type of device that you want to test--for example, **Sound, video and game controllers**.

Right-click the device that you want to test for conflicts, and then select **Properties**.

Select the **Resources** tab.

Any conflicts that exist for the device are listed under **Conflicting device list**.

## Windows Hardware Trouble shooter

Use the Windows Hardware trouble shooter to help you troubleshoot and resolve a hardware conflict or other hardware-related issues. To start the Hardware trouble shooter, follow these steps:

Sign in to your computer as an administrator or as a member of the Administrators group.

Select **Start**, point to **Administrative Tools**, and then select **Computer Management**.

Under **System Tools** in the console tree, select **Device Manager**.

The devices that are installed on your computer are listed in the right pane.

Double-click the type of device that you want to troubleshoot--for example, **Modems**.

Right-click the device that you want to troubleshoot, and then select **Properties**.

Select the **General** tab.

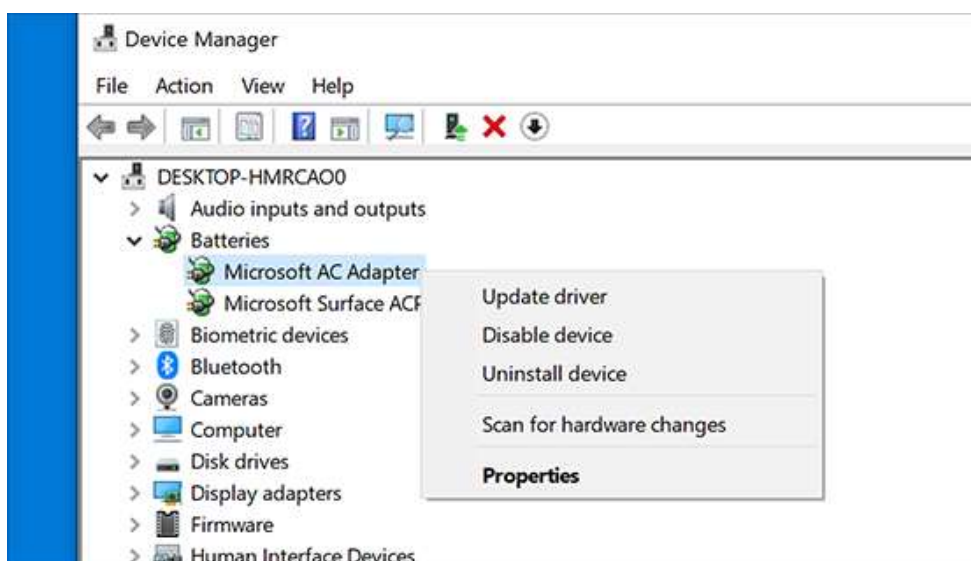
Select **Troubleshoot**.

## KT2103 Updating drivers

### Update drivers manually in Windows

#### Before you begin

Driver updates for Windows, along with many devices, such as network adapters, monitors, printers, and video cards, are automatically downloaded and installed through Windows Update. You probably already have the most recent drivers, but if you'd like to manually update or reinstall a driver, here's how:



Update the device driver

In the search box on the taskbar, enter **device manager**, then select **Device Manager**.

Select a category to see names of devices, then right-click (or press and hold) the one you'd like to update.

Select **Search automatically for updated driver software**.

Select **Update Driver**.

If Windows doesn't find a new driver, you can try looking for one on the device manufacturer's website and follow their instructions.

Reinstall the device driver

In the search box on the taskbar, enter **device manager**, then select **Device Manager**.

Right-click (or press and hold) the name of the device, and then select **Uninstall**.

Restart your PC.

Windows will attempt to reinstall the driver.

## KT2104 Removing device drivers

### How to Uninstall Drivers in Windows

Installing drivers can be a hair-raising adventure, even on today's modern operating systems. These finicky pieces of code act as the middleman between your PC's hardware and its operating system. Although they install with ease just like any other software, they integrate deeply into the OS, sinking their teeth into areas most other software doesn't go near. Most of the time the driver installation process is simple, seamless, and transparent to you, as it should be.

On those occasions when things go wrong, however, they can go *really* wrong, and even crash your entire computer. For example, when Microsoft's Windows Vista came out in 2007, critics lambasted it for being slow and prone to crashing; Microsoft investigated the causes and found that a majority of crashes were due to driver issues.

Thankfully, when you prepare yourself for battle with a problematic driver, you have a couple of tricks that can help. Microsoft has introduced an easy way to roll back to a previous (and, you hope, more stable) version of the driver, or remove it from the system altogether, giving you a clean slate to try again or install a different version.

### Roll Back to a Previous Driver

Click *Start*, type **Device Manager**, and press **Enter**.

Find and double-click the category of device causing the issue (for instance, the graphics card would be listed under Display Adapters).



Double-click the problematic device to bring up the Properties window.

Click the *Driver* tab.

Click the *Roll Back Driver* button.

A dialog box will ask you to confirm your decision to roll back to a previous driver. Click *Yes* to begin the roll-back process. Use the Properties menu to uninstall your driver software or roll back to a previous version.

At this point Windows will automatically remove the current driver for the device and reinstall the previous driver. You may then receive a notification that the system settings have changed, and Windows will ask you to reboot. If you see that message, you should reboot your computer as soon as possible.

## Uninstall a Driver

When you need to uninstall a driver completely, the best and safest method is to use the device's uninstaller program (if it has one). If you added the device to your system through an installer (as is the case with most graphics card and sound card drivers, for instance), you can uninstall it just as you would any other program.

Click *Start*, type **Uninstall Program**, and press **Enter**.

In the Uninstall window that appears, go through the list and find your device or drivers. Double-click the entry to begin the uninstallation process.

Sometimes devices won't have an uninstaller, or the uninstaller will not appear in the list. In those instances, you can use the Device Manager to remove the driver completely.

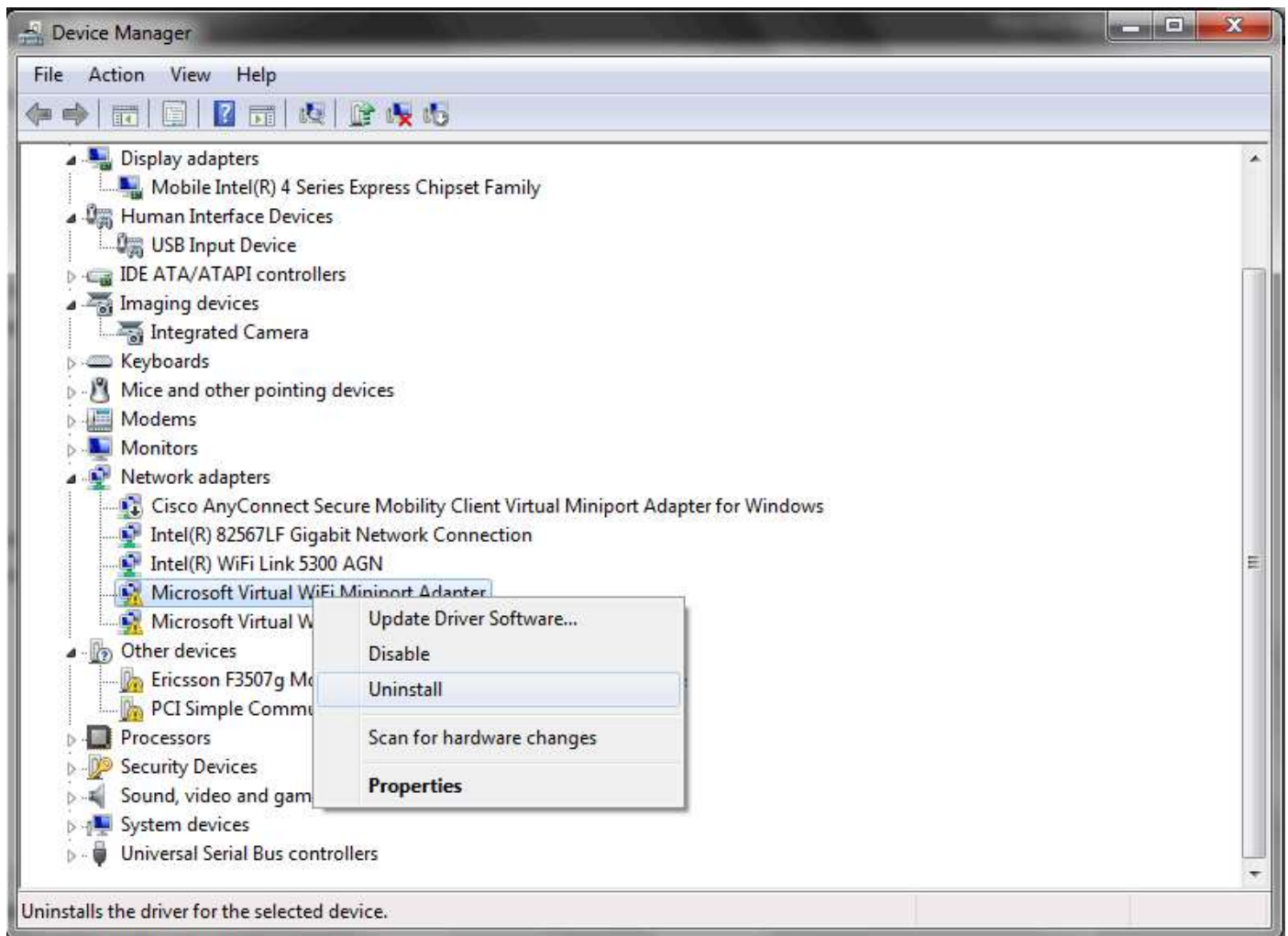
Click *Start*, type **Device Manager**, and press **Enter**.

Find and double-click the category of device whose driver you wish to uninstall (for example, the graphics card would be listed under Display Adapters).

Right-click the device, and click Uninstall.

Windows will prompt you to confirm the device's removal. Click *OK* to remove the driver.

After the uninstallation is complete, reboot your computer as soon as possible. In a pinch you can use the Windows Device Manager to uninstall troublesome driver software.



After you roll back or uninstall a problematic driver, you can try downloading and installing the latest version from the manufacturer's website, or try a specific version that previously worked to get your computer back on its feet.

## KT2105 Plug-and-play devices

Plug & Play, sometimes abbreviated to PnP, is a technology that allows peripheral devices to be connected to a computer and used almost immediately. All the user has to do is plug the device into a free computer port, with no need for manual configuration and no need to install a driver. One of the first companies to introduce this technology was Microsoft. Plug & Play was first available in Windows 95.

### Plug & Play: How it works

Before Plug & Play became a standard feature of the most popular operating systems, users had to manually set up expansion cards and peripheral devices in a multi-step process and install suitable drivers for each hardware component.

With Plug & Play, the newly connected hardware component creates a unique identification code instead. The computer then uses this code to recognise the [hardware](#) and allocate the required computer

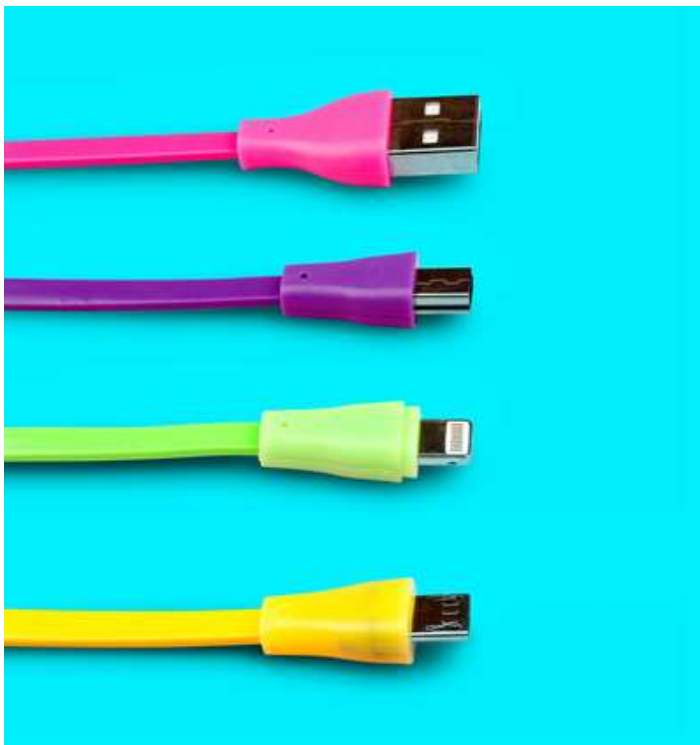


resources, as well as automatically configuring parameters required for operation and loading the correct drivers. This automated process allows users to connect devices to the USB port of their computer and start working with them straight away. It also enables fast, convenient [zero-touch provisioning](#) of new hardware – an example of this is [Cloudya, the cloud telephone system from NFON](#).

### Plug & Play and security

While it is convenient, the Plug & Play technology can also introduce security risks. In principle, a malicious actor can compromise a computer by simply plugging in hardware – such as a manipulated USB stick –, thus gaining unauthorised access to data in order to manipulate this data or to install malware. This is why business computers often have the Plug & Play feature of their USB ports protected or completely deactivated.

NFON takes security very seriously. In January 2020, we introduced a new, patented technology for the secure [auto provisioning of end devices](#). The NFON platform now requires two-factor authentication (2FA) for newly connected hardware devices. When commissioning new phones, users must enter a one-time, six-digit Phone Authentication PIN (PAP). This prevents cyber attacks and increases the level of security for all users. Read more about it here: [NFON AG introduces two-factor- authentication for hardware](#)



### Further information

#### Voice over Internet Protocol (VoIP)

##### What is VoIP?

The **Voice over Internet Protocol**, also called **IP telephony**, is a method of communication for making calls over a broadband Internet connection as an alternative to regular calls made...

## KT2106 Device failure

Recovery procedure for a system failure

A system failure is a problem either with hardware (other than disk) or with operating system software that causes your system to end abnormally.

After your service representative has corrected the problem, follow the procedure to start your system after an abnormal end.

## KT2107 System restore points

### Restore point

#### What is restore point?

A system restore point is a backup copy of important [Windows](#) operating system ([OS](#)) files and settings that can be used to recover the system to an earlier point of time in the event of system failure or instability. It is a part of Windows XP, Vista, 7, 8, 10, 11 and Windows Server. They are created automatically or manually. System restore points only affect OS and application files, but not user data.

#### How do system restore points work?

The Windows [system restore](#) utility is responsible for making and using restore points. In old versions, Windows XP and Server 2003, the restore points were saved by the utility. Since Windows Vista, system restore points are made using the Microsoft Volume Shadow Copy Service ([Microsoft VSS](#)).

System restore points are designed to help the user recover the OS in the event an update, [driver](#) or application damages the OS. This way, copies of the files needed for operation are available and can be used to restore from. A system restore point can be called the last known good configuration.

The amount of hard drive space used by system restore points varies from 1% to 15%, depending on the size of the drive. If the reserved space for system restore points fills up, it will delete old copies to make space for new ones. System restore points also only store changed files -- also known as the difference -- and therefore use less [storage](#) than a full copy.

System restore is different than Windows Reset this PC or go back to the previous version of Windows.

#### What a restore point saves and recovers

A system restore point is primarily used for OS files and settings. It saves Windows system files and drivers. This will help in the event of a bad Windows update or system corruption. It also saves [executable](#) application data. This can be used in the event a program affects system performance or stability. The system [registry](#) and configurations are also saved.

The Windows Security Account Manager ([SAM](#)) and passwords are not backed up in restore points. Saved passwords may not be available after a system restore. This also means that a corporate [domain](#)-joined computer may lose its association to the domain after a restore and will need to be rejoined to the domain.

A system restore point is not a [full backup](#). It does not affect user data or files. This means that a system restore point can be safely used by a user. A system restore will not delete personal files such as documents, pictures, music or videos. Be careful, though; because these files are not affected by a system restore, it cannot be used to recover these types of files if they are accidentally deleted. The Volume Shadow Copy may have copies of user files separate from system restore points though.

A system restore point is also only a local copy of the data. If the computer hardware is damaged a system restore cannot be used. It also cannot be used to transfer data from an old computer to a new one. A [Windows system image](#) may be used to create a full backup.

### **When system restore points are made and how to make a manual restore point**

Windows will automatically make a restore point before doing most changes. This allows the system to easily rollback the change if something goes wrong. An automatic restore point is made before a Windows update is installed, an unsigned driver is installed, or a program is installed from an MSI. A restore point is also made every seven days if no other automatic restore point has been otherwise made.

Creating a manual system restore point is easy. In [Windows 10](#) and [Windows 11](#):

Open the **Settings** app and go to the **System**

From the system page open the **About** tab, then go to the right side under Related Settings.

Click **Advanced System Settings**. This opens the System Properties window.

From there, go to the **System Protection**. This has all the system restore settings.

To create a manual system restore point click the button labeled **Create...** and then give it a name that will help identify what the point is for.

### ***Internal Assessment Criteria and Weight***

- IAC2101 Considerations for configuring device drivers are reasoned

***(Weight 5%)***

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