V2406 Windows Embedded Standard 7 User's Manual

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V2406 Windows Embedded Standard 7 User's Manual

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Introduction

Thank you for buying Moxa's V2406 series of x86 ready-to-run embedded computers. It comes with the Windows Embedded Standard 7 operating system, providing a simple and familiar development environment for on-board train applications.

- **Software Components**

Software Components

Refer to the following content for the software components of the Windows Embedded Standard 7 pre-installed on the V2406 computers.

Core OS:

• 32-bit support
• Remote Client
• Remote Procedure Call

Applications and Services Development:

• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ

Internet Services:

• Internet Explorer 8.0
• IIS 7.0

File Systems and Data Store:

• Windows Data Access Components
• Windows Backup and Restore

Diagnostics:

• Common Diagnostic Tools
• Problem Reports and Solutions

Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts

Graphics and Multimedia:

• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12

International:

• IME Simplified Chinese Support
• IME Traditional Chinese Support

Management:

• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update

Networking:

• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking

Security:

• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)

Embedded Features:

• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET

Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control

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System Initialization

This chapter describes how to initialize the system settings on V2406 computer when you boot up the computer at first time.

The following topics are covered in this chapter:

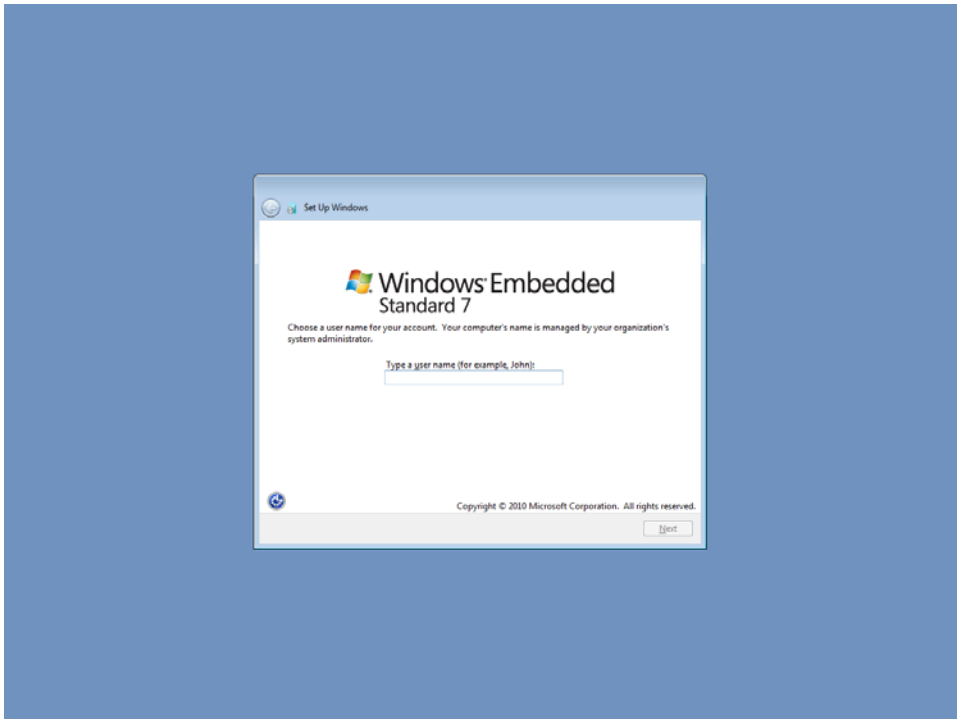
- **Overview**
  - Initializing User Settings

Overview

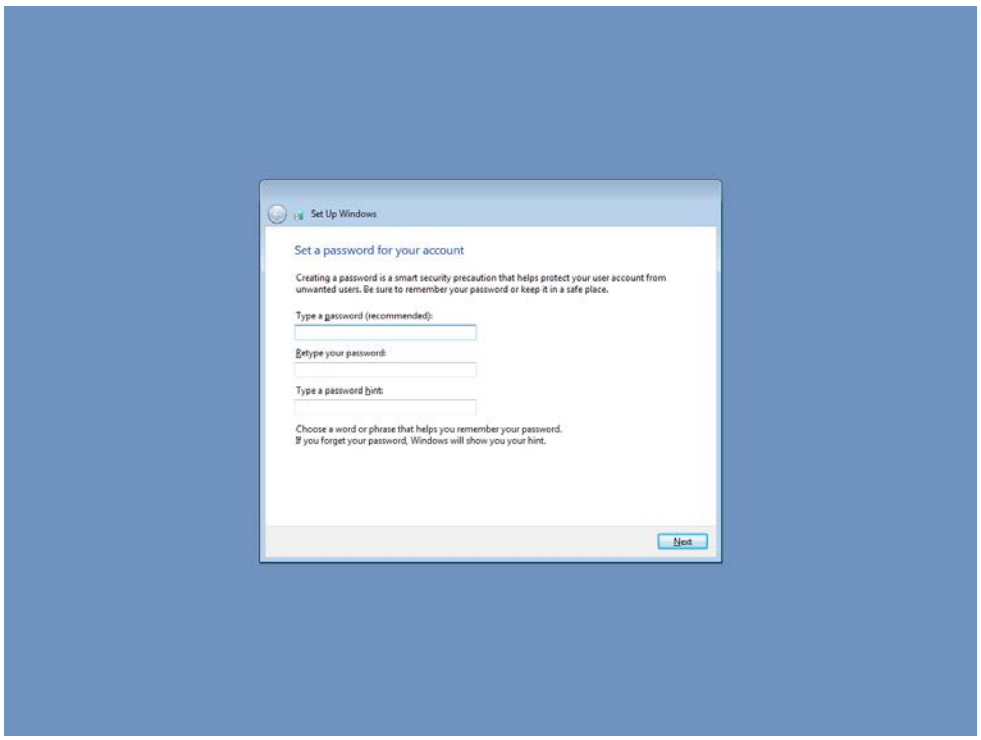
Like most laptop computer, you need to type a user name to create your user account to enable the embedded computer to work, follow the steps below:

Initializing User Settings

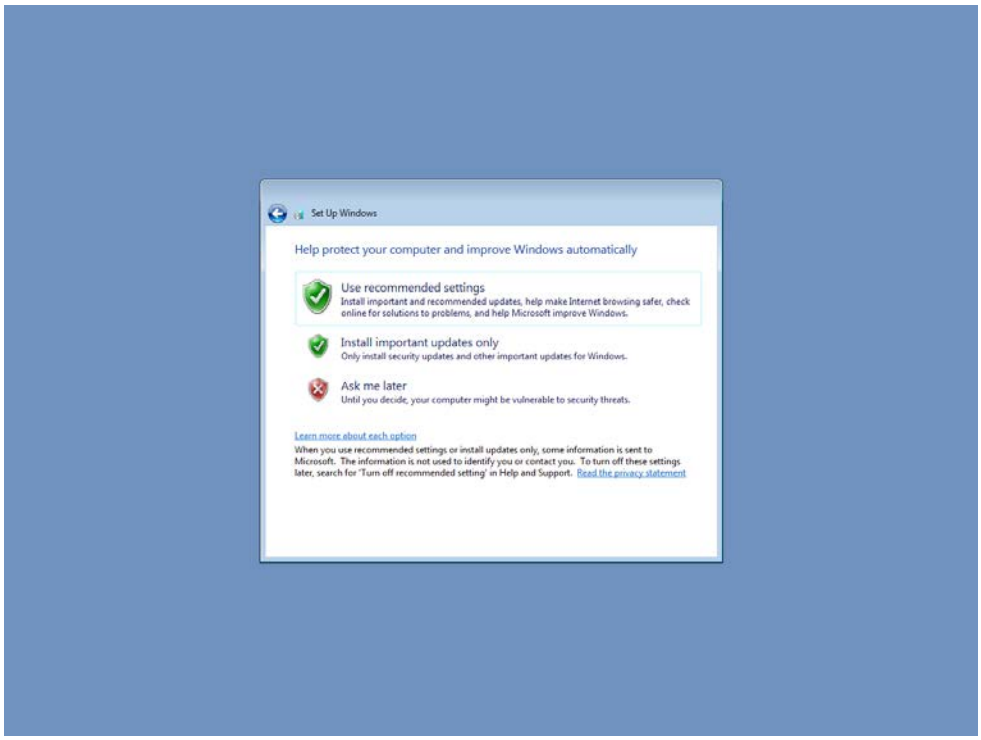
1. When you boot the embedded computer for the first time, you need to enter a user name for this computer.



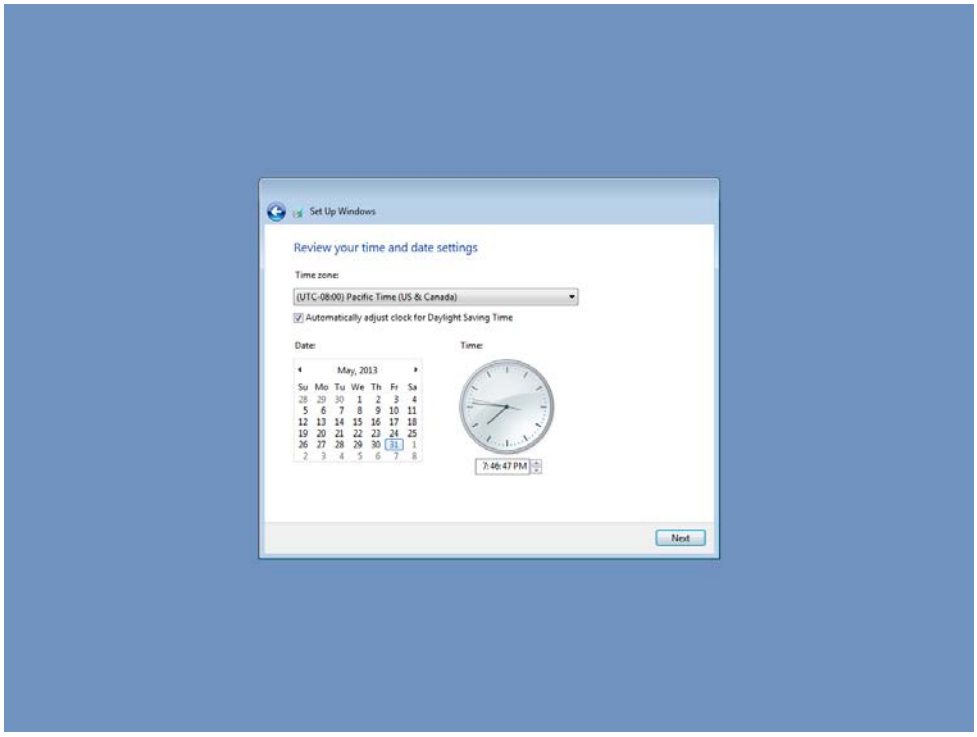
2. Type the password, retype the password. In addition, you may also type a password hint in case you forget your password. If you do not want to set the password, leave it blank and click **Next**.



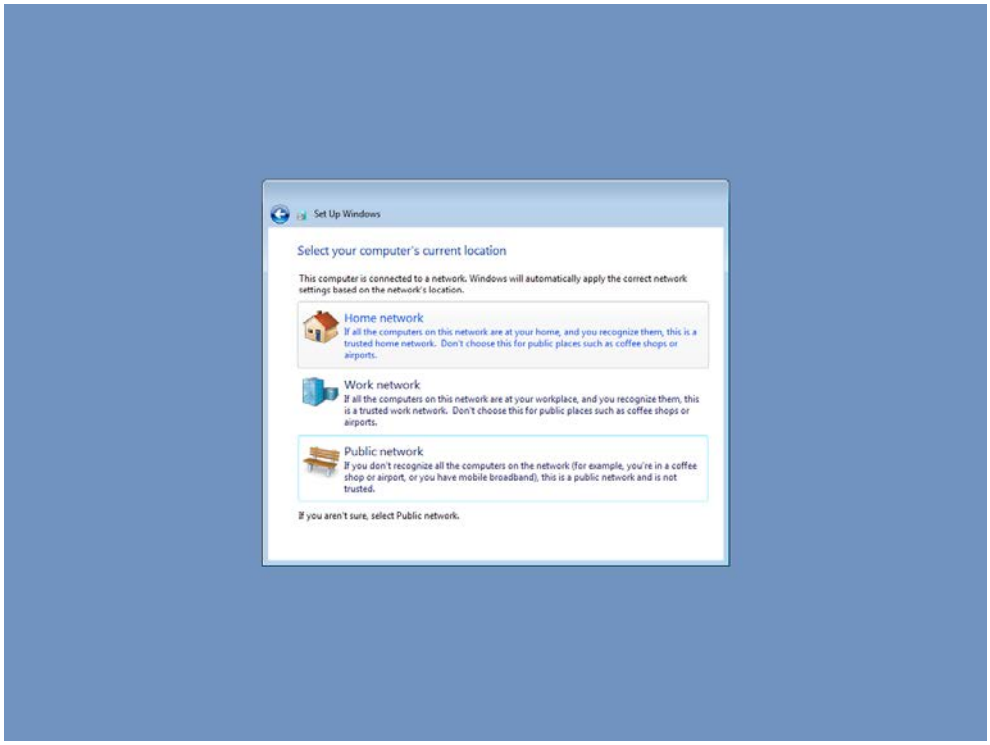
3. Select the windows update option.



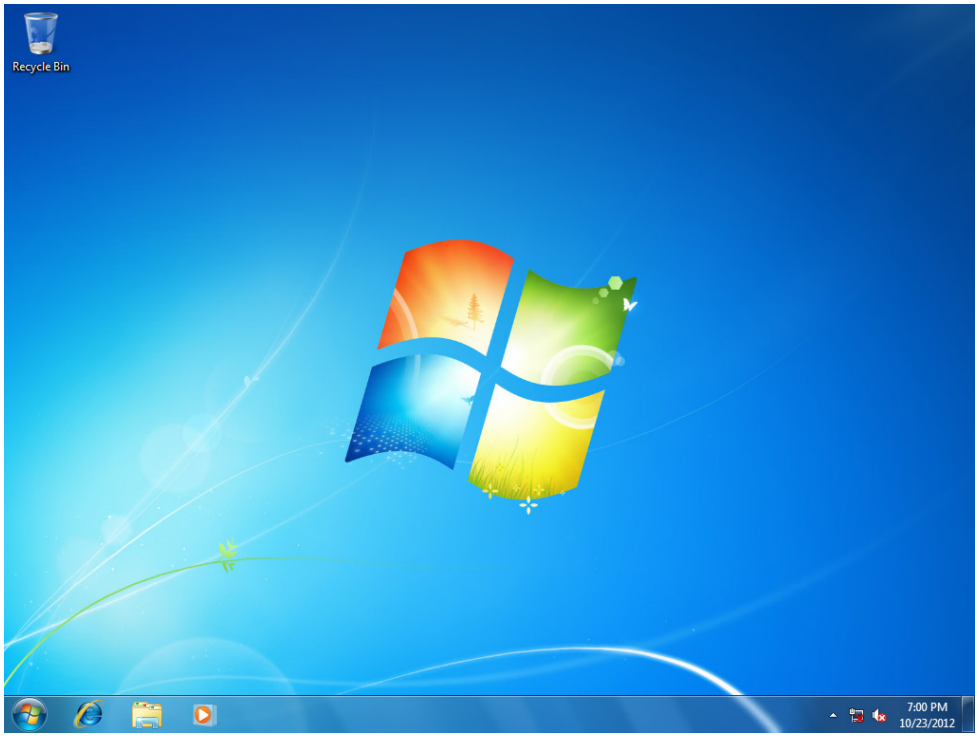
4. Select the time zone and daylight saving time option and click **Next**.



5. Select computer's current location. Windows will automatically apply the correct network settings based o the network's location.



6. Now you can start to use V2406 embedded computer.



3

Enabling Embedded Filters

This chapter describes how to operate the embedded enabling features on the V2406 computer.

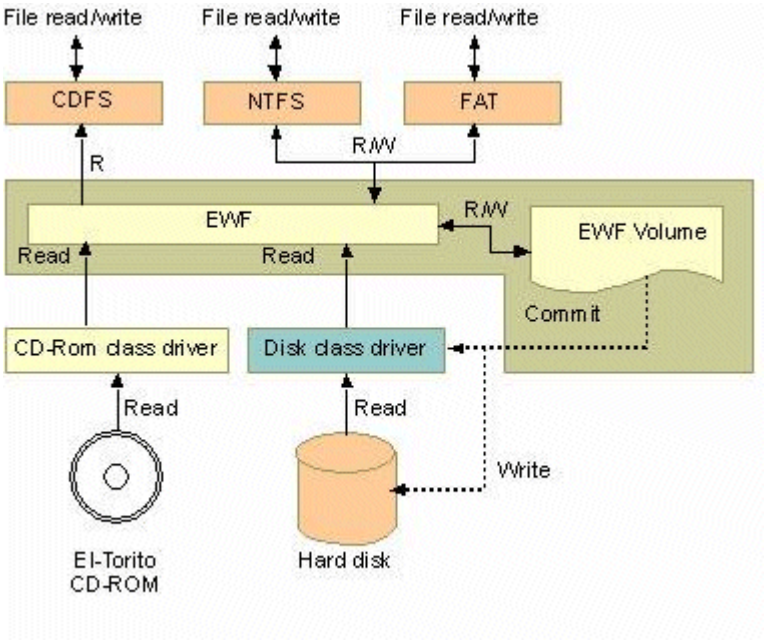
The following topics are covered in this chapter:

- **Enhanced Write Filter**
  - Overview
  - Enabling Enhanced Write Filter
- **File-Based Write Filter**
  - Overview
  - Configure File-Based Write Filter

Enhanced Write Filter

Overview

Enhanced Write Filter (EWF) provides a means for protecting a volume from writes. This allows the operating system (OS) to boot from write-protected hard disks. All writes to an EWF-protected volume. (The Hard Disk in the figure below) are redirected to an overlay (EWF Volume in the figure below). Because EWF does not write data to hard disk directly, so it can protect the hard disk from sudden power loose. These writes are cached in the overlay and made available as part of the volume. This gives the appearance that the volume is writeable. The overlay is an independent storage location which exists in random access memory (RAM). If desired, the data stored in the overlay may be committed to the protected volume. Refer to the following figure for the overview of the EWF structure.



To get more details about EWF configuration and usage, you may:

- Visit Microsoft's EWF Volume Configuration help pages.
- Visit Microsoft's EWF overview on the official Microsoft EWF help pages.
- Visit Microsoft's detailed description of EWF modes on the EWF help pages.
- Visit Microsoft's detailed description of the EWF API.

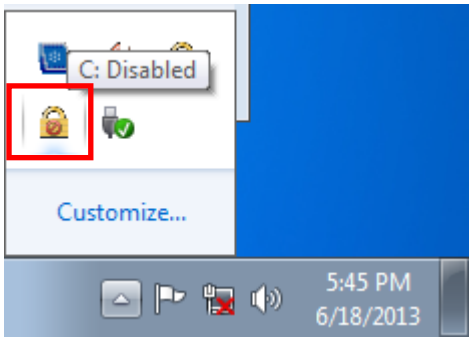
For the EWF commands, refer to the MSDN web site:

http://msdn.microsoft.com/en-us/library/ms940853%28v=winembedded.5%29.aspx

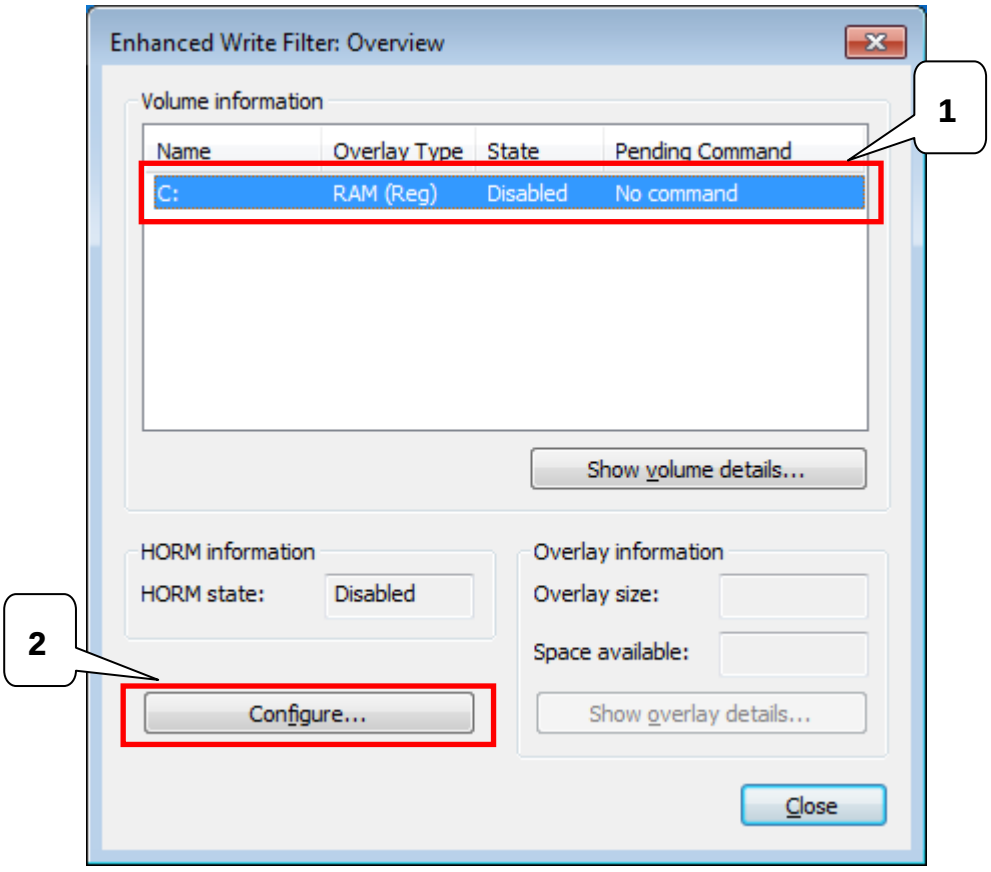
Enabling Enhanced Write Filter

Follow these steps to enable the Enhanced Write Filter

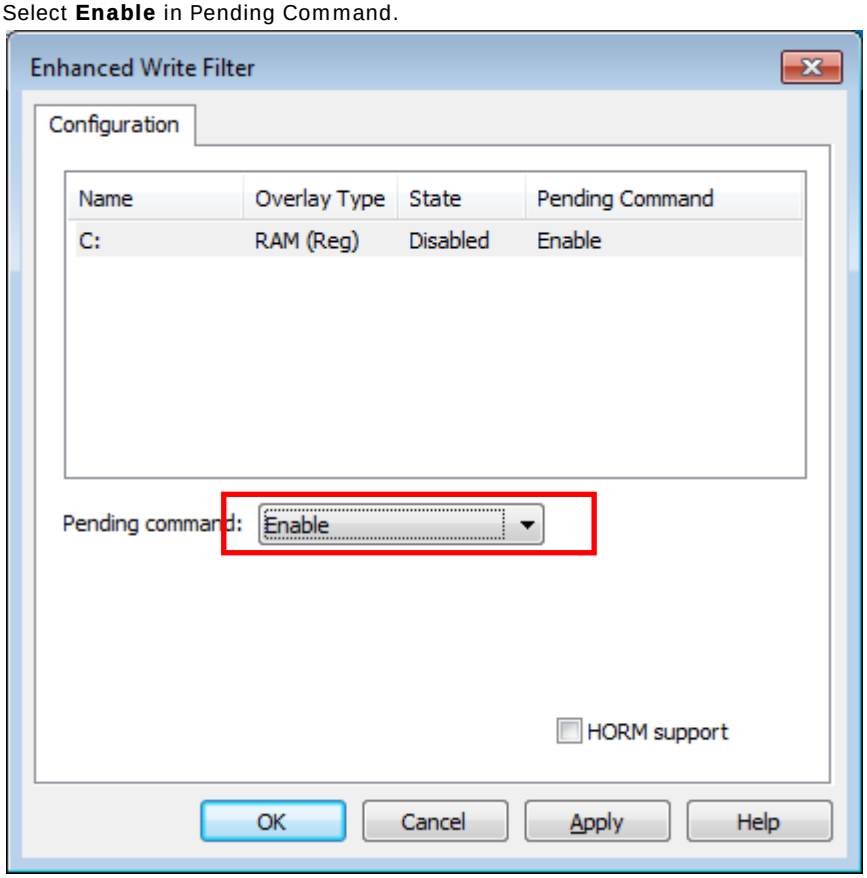
1. First open right-click the lock icon in the left side.



2. Select volume in Volume Information and then select **Configure**.

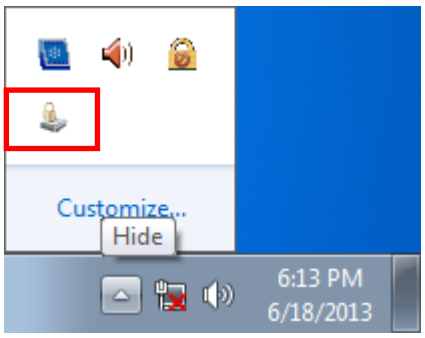


3. Select **Enable** in Pending Command.

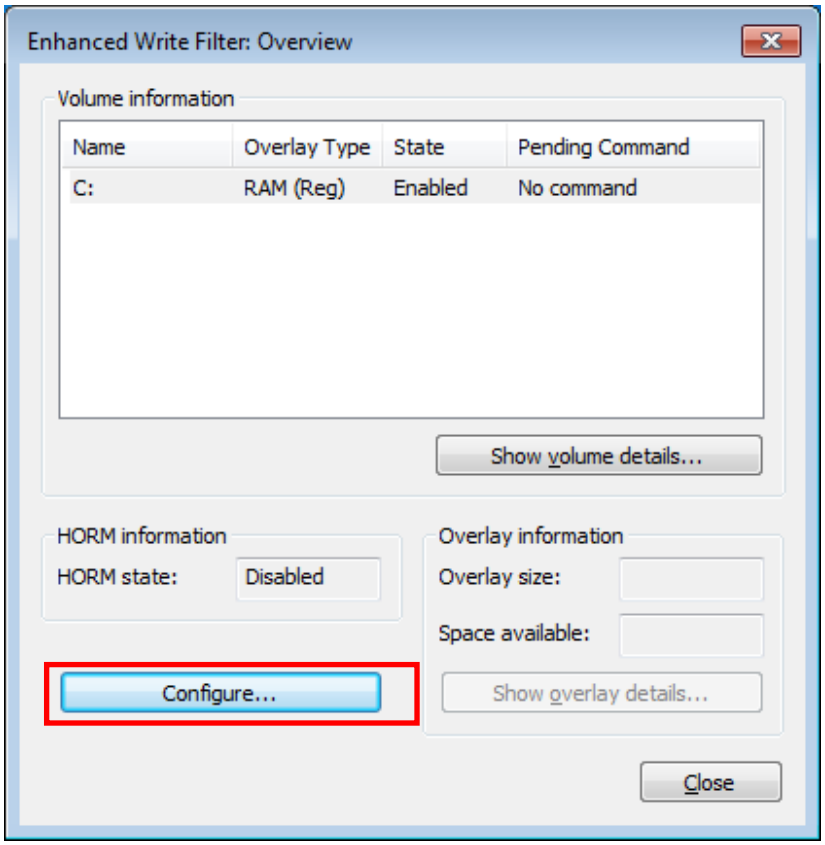


4. Reboot the system.

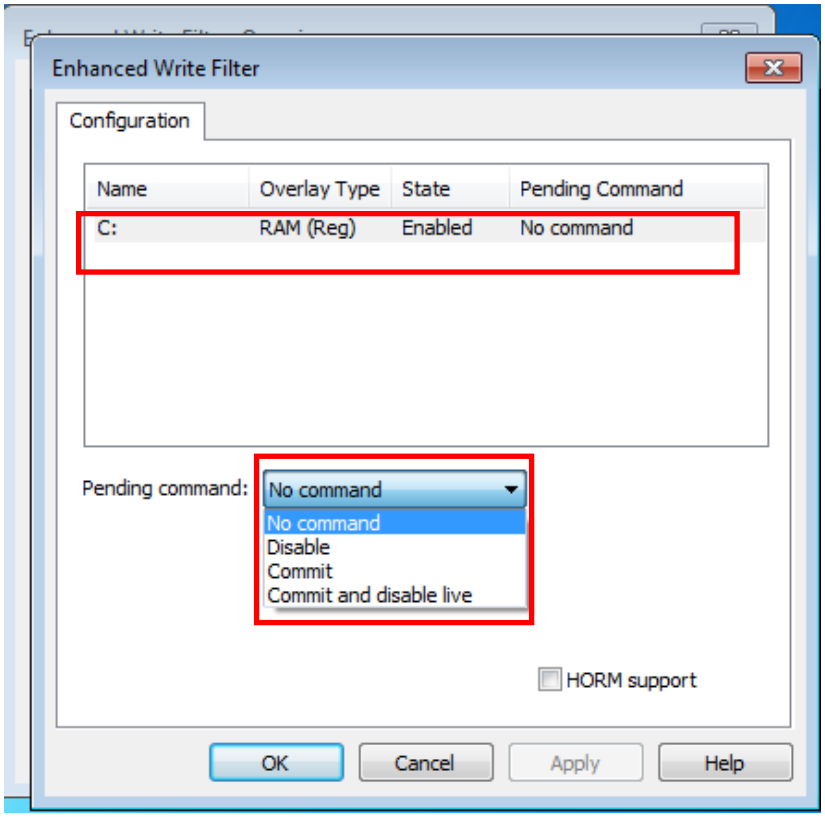
5. Check if the icon has been changed to locked status.



6. Select **Configure.**



7. Select volume and select the Pending Command for your need.



For the detailed descriptions for these commands, please refer to the Microsoft website shown below:

http://msdn.microsoft.com/en-us/library/ff794092(v=winembedded.60).aspx

File-Based Write Filter

Overview

This section describes how to use the File-Based Writer Filter (FBWF). Please note that when Enhance Writer Filter is enabled, the File-Based Writer Filter function will not work.

According to Microsoft:

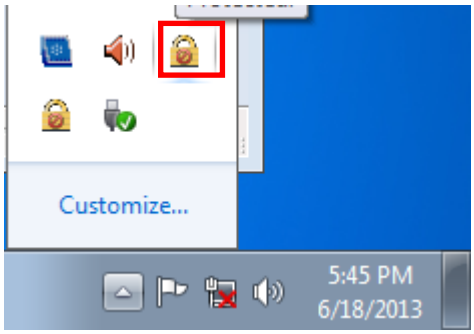
> *File-Based Write Filter (FBWF) allows the Windows Embedded platform to maintain the appearance of read and write access on write-sensitive or read-only storage. FBWF makes read and write access transparent to applications.*
> *Writing to storage media may be undesirable or impossible in embedded devices. FBWF redirects all writes targeted for protected volumes to a RAM cache called an overlay. Used in this context, an overlay is similar to a transparency overlay on an overhead projector. Any change made to the overlay affects the picture as seen in the aggregate, but if the overlay is removed, the underlying picture remains unchanged.*

FBWF provides the advanced feature than EWF to let user specify the directory to write the data to disk drive directly, in our default setting, the default directory is under c:\temp, which means you can read/write the data into disk without commit action.

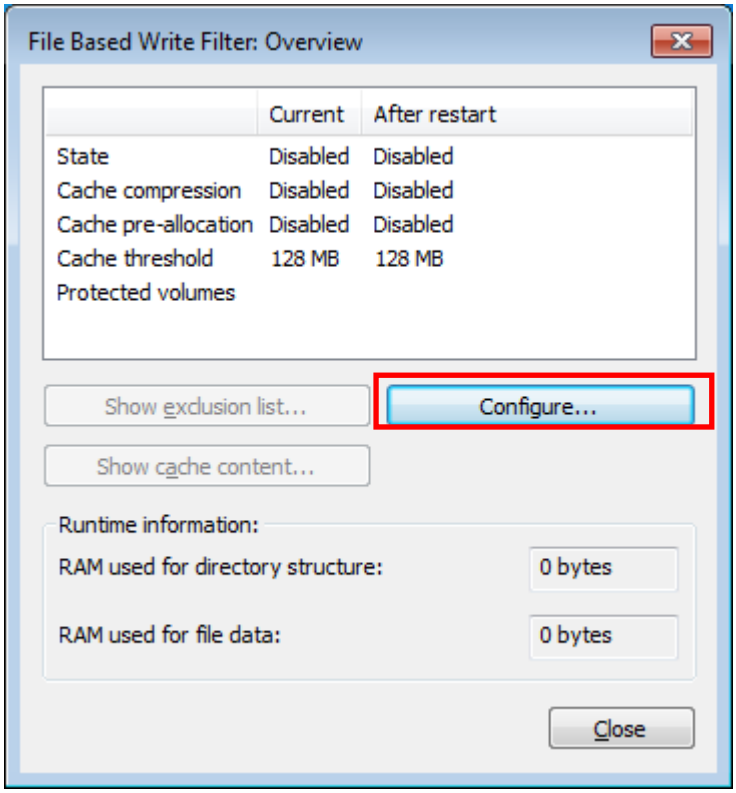
Configure File-Based Write Filter

To enable file-based write filtering, do the following:

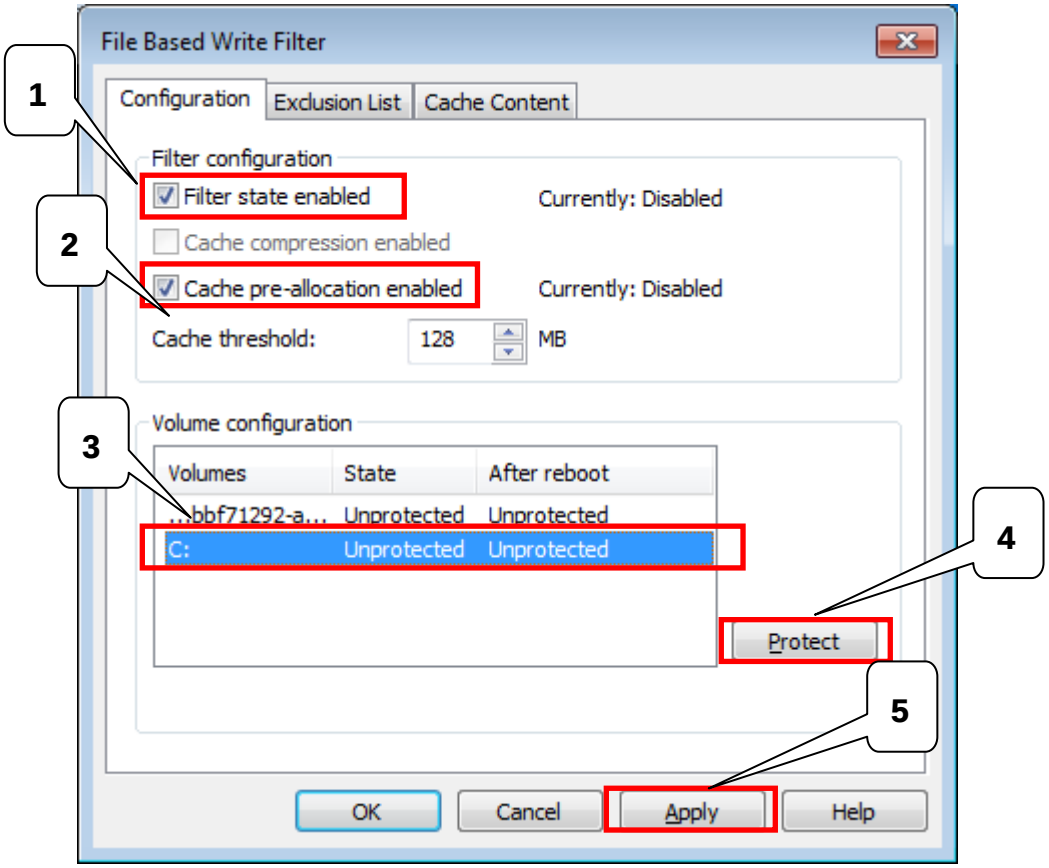
1. Right-click the lock icon on the right side



2. Select **Configure**.

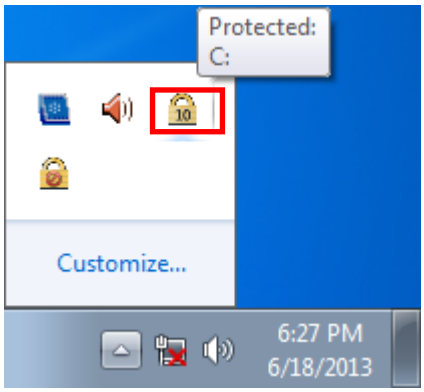


3. In the configuration tab, check **Filter state enabled** and **Cache pre-allocation enabled**. And then select C:, and then select **Protect** and **Apply.**

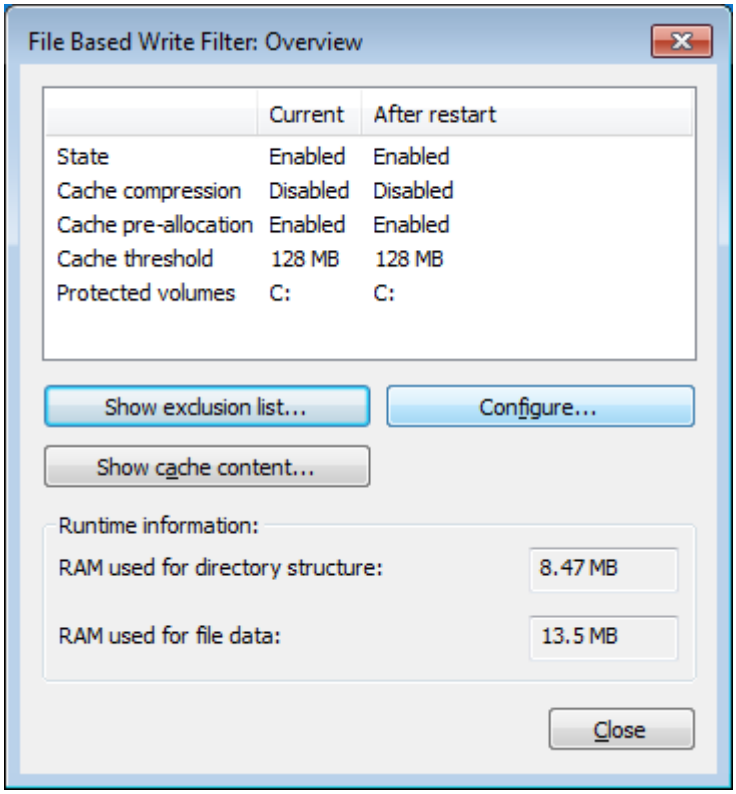


4. Reboot the system.

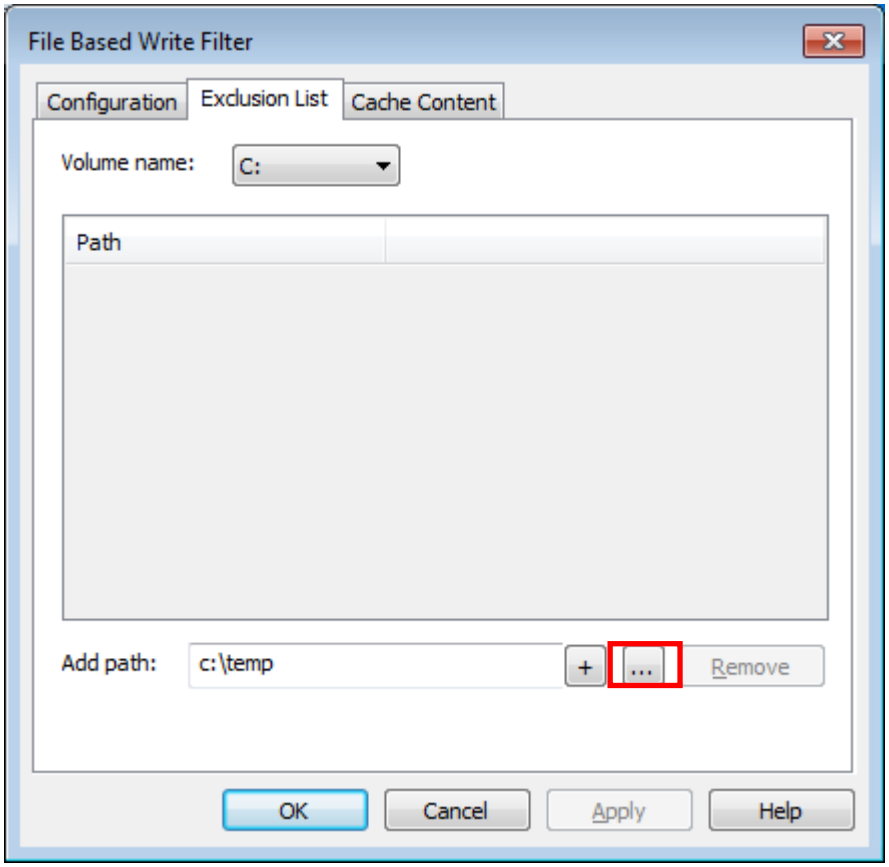
5. Right-click the icon.



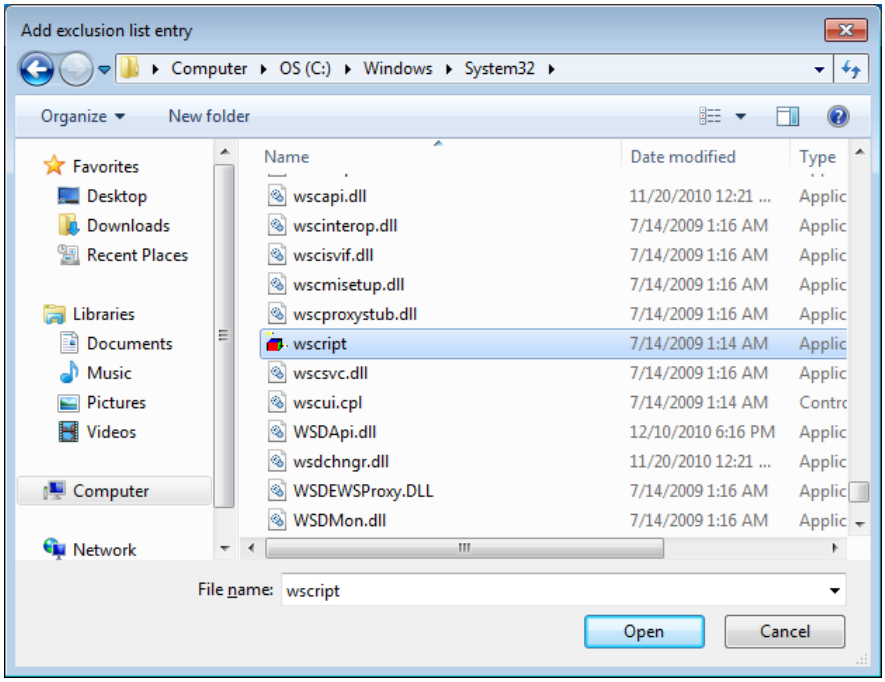
6. Click **Configure.**



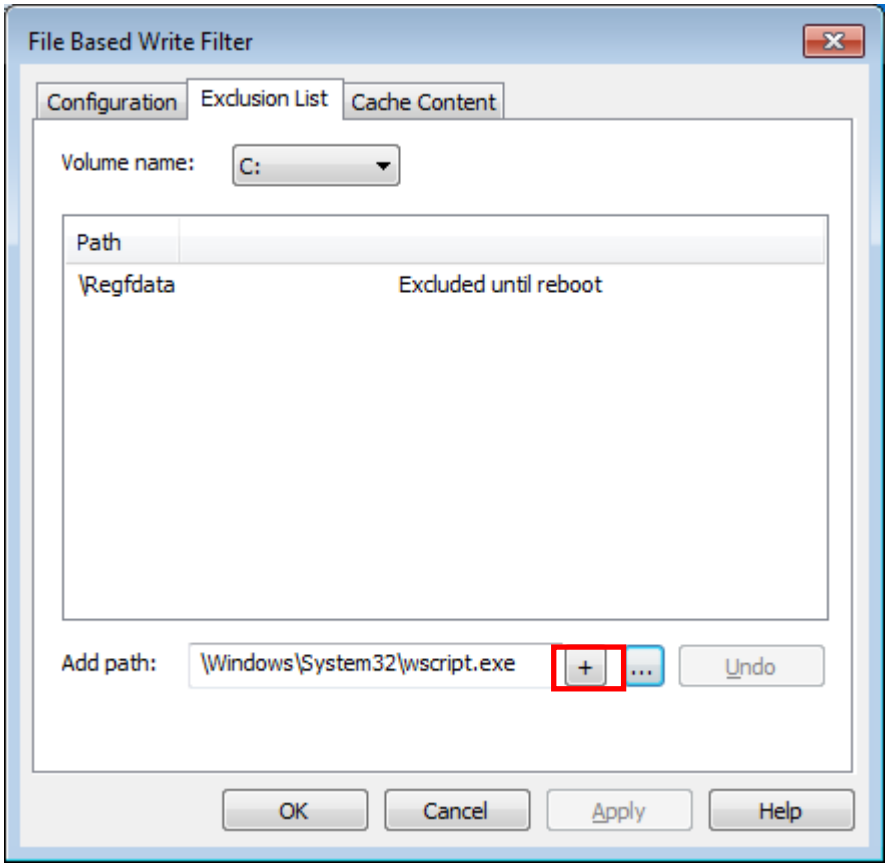
7. Change to **Exclusion List** and select browse button.



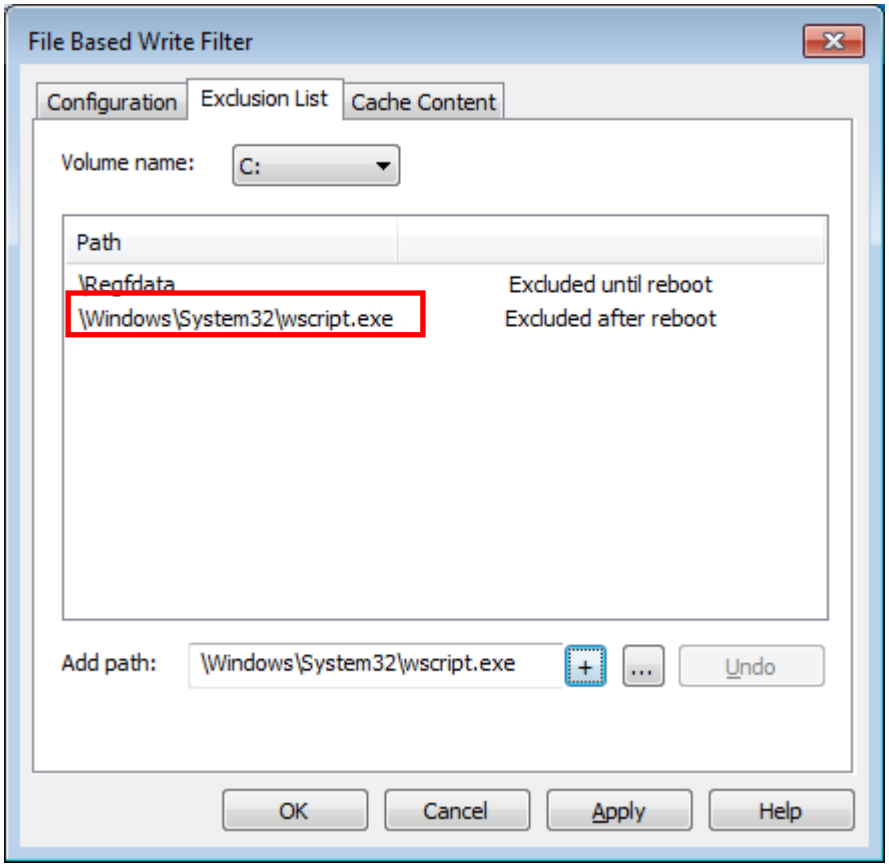
8. Select the file to exclude the protection.



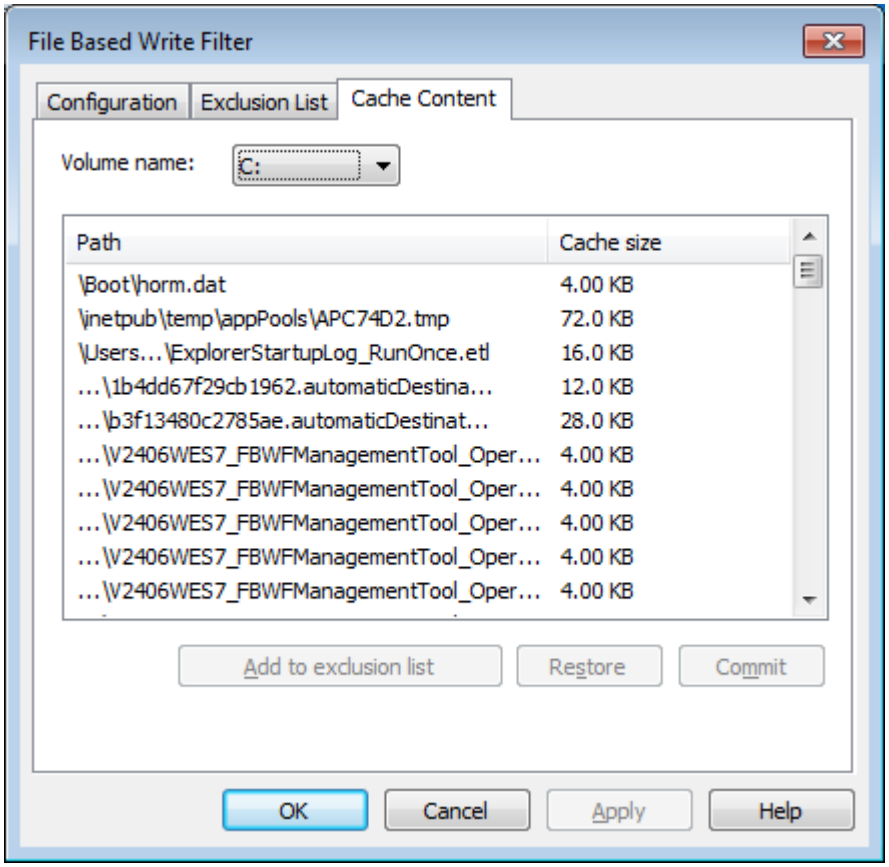
9. Click **+** button.



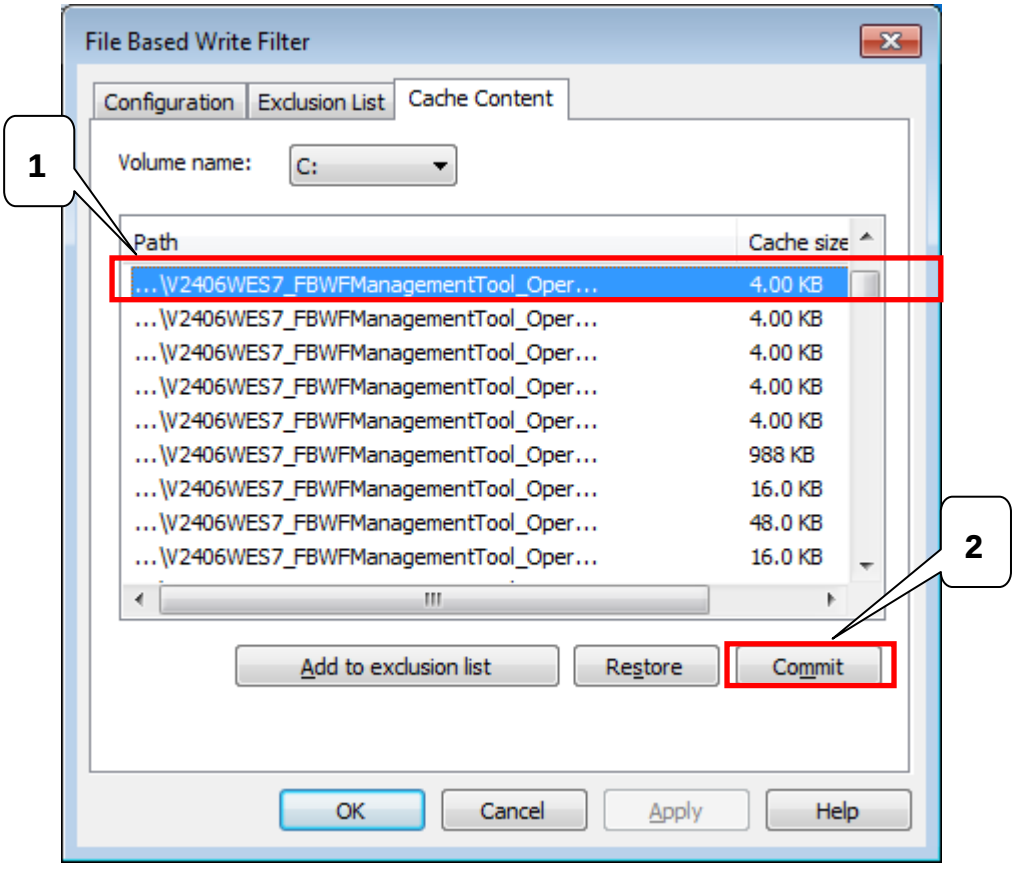
10. Check if the file path has been added.



11. Change to **Cache Content** tab.



12. Select the file to you want to save to physical disk and select **commit.**



13. Reboot system to take effect

To get more details about EWF configuration and usage, you may:

Go to Microsoft's FBWF Installation and Configuration help pages.

Go to Microsoft's FBWF overview on the official Microsoft EWF help pages.

Go to Microsoft's detailed description of FBWF features on the EWF help pages.

Go to Microsoft's detailed description of the FBWF API.

4

Examples

This chapter describes how to use various examples on the V2406 computers for different functions.

The following topics are covered in this chapter:

- **Watchdog**
  - Enabling Watchdog Function

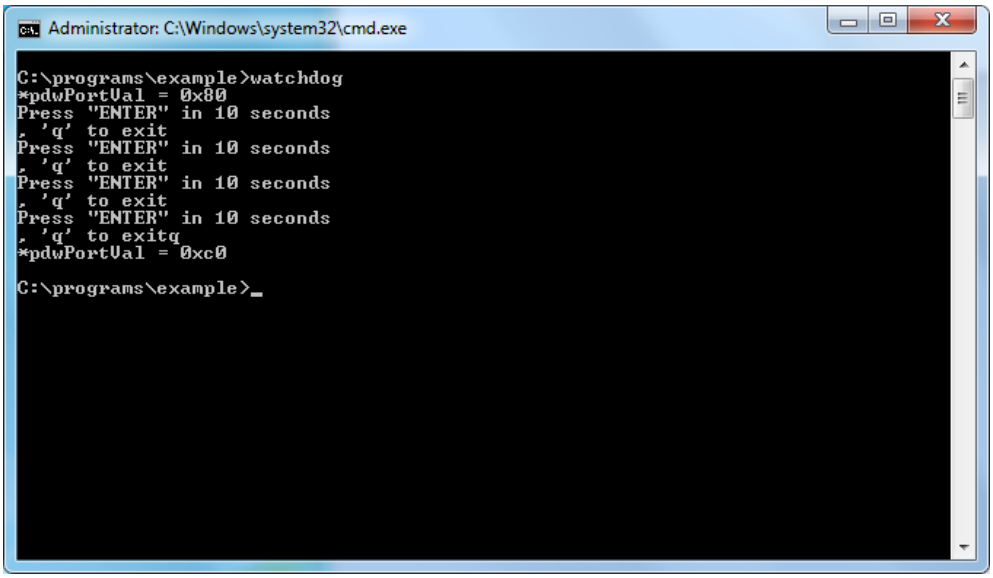
Watchdog

The V2406 computers provide example for users to enable the watchdog function. The Watchdog example is under <Software DVD>**\examples\project\WatchDog** and the executable file **Watchdog.exe** is under <Software DVD>**\examples\V2406Release**.

You can follow the steps below to test the watchdog function with executable file.

Enabling Watchdog Function

1. Create c:\programs\example folder and copy the **Watchdog.exe** into the folder.
2. Execute **Watchdog.exe.**
3. You will see the ***pdwPortVal = 0x80** which means the watchdog function is enabled, and then you need to press **Enter** in every 10 seconds or the system will reboot.
4. To stop the watchdog function, press **q** to exit the program, and you will see the ***pdwPortVal = 0xc0** which means the watchdog function is disabled.



5

System Recovery

The V2406 ready-to-run embedded computers are a Windows Embedded Standard 7 platform. This chapter describes the recovery process in the event of system instability.

The following topics are covered in this chapter:

- **Overview: Setting Up the Recovery Environment**
- **Step 1: Prepare the USB drive**
- **Step 2: Setting the BIOS to Boot via USB**
- **Step 3 (opt.): Create a Custom System Image**
- **Step 4: Reset BIOS to Original State**
- **Step 5: Perform a Test Restoration**

Overview: Setting Up the Recovery Environment

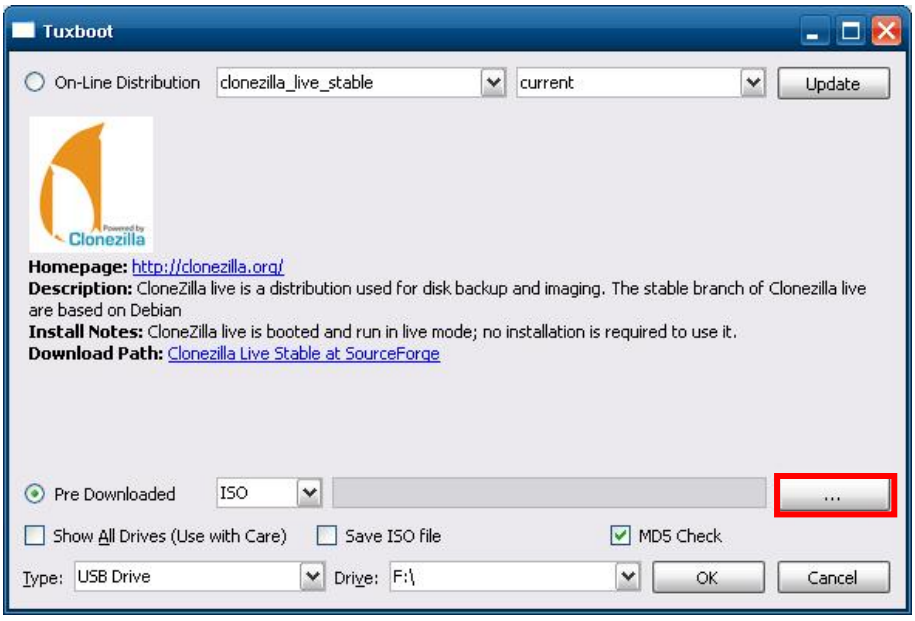
A V2406 computer, a 4 GB (min.) USB drive, and a copy of the recovery suite are all required to set up the V2406's system recovery environment.
The recovery procedure itself requires only a V2406 computer and a bootable USB drive.

The following procedure describes the basic process of setting up the system recovery environment.

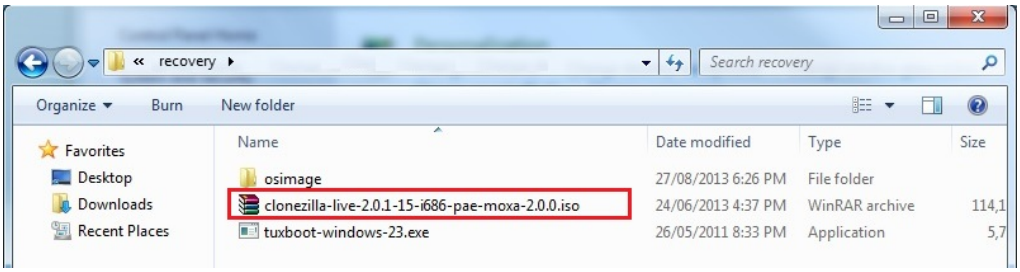
1. First, the recovery programs and system image file will be copied over to the USB drive, and the drive will be set up to provide a system boot process by copying an ISO image of the boot environment to the USB.
2. The system will be re-booted, and BIOS will be manually configured to boot the system from the USB port.
3. An image of the current software system will be created on the USB drive, for the recovery environment to use when restoring the system.
4. The system will be re-booted again, and the BIOS returned to its original state.

Step 1: Prepare the USB drive

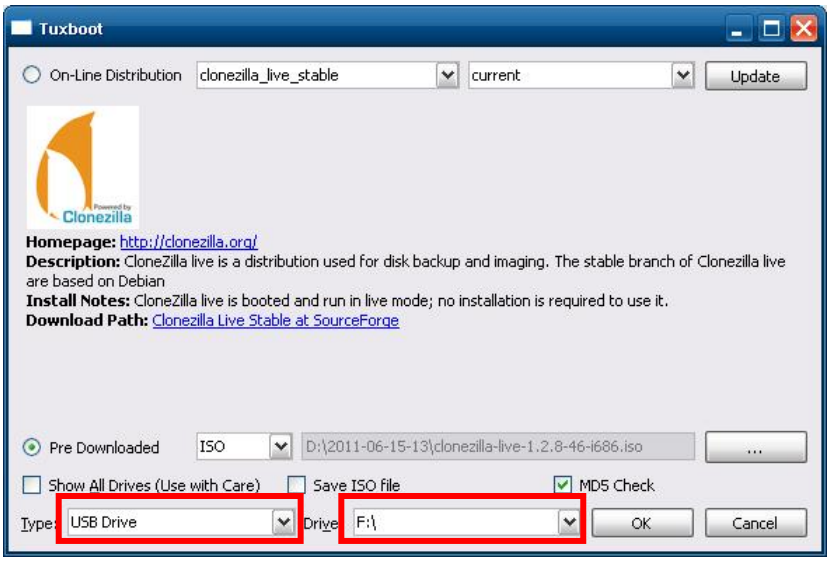
1. Load the software DVD that came with your V2406 computer and execute `tuxboot-windows-23.exe` from the software DVD`\recovery\V2406_2426_W7E` folder, select **Pre-Downloaded**, and click the button marked with an ellipsis (**...**) to browse the file system and find the location of the boot environment's ISO image.



2. Navigate to**`\recovery`**`\`on the software DVD and select the boot environment's ISO image.



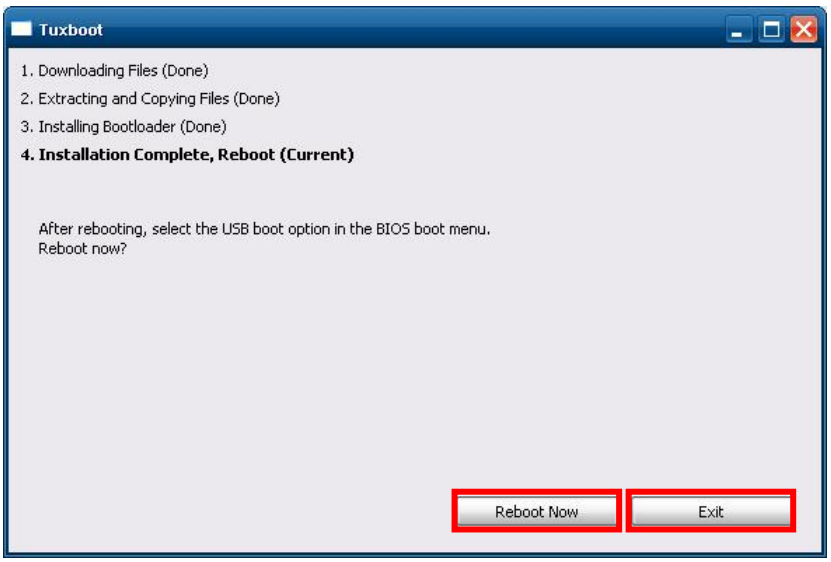
3. Set the device **Type** (lower left-hand corner) as **USB Drive**, then set the **Drive** dialog to the letter under which the USB is currently mounted.



4. Click **OK**, and the boot environment t and bootloader will be copied to your USB drive.
5. Because of the file system naming conventions used, for any given computer only a single recovery image may be used on any given USB drive. Consequently, at this point, users need to make a decision about which sort of system recovery is preferred:
    A. a basic recovery of the root OS, or
    B. a recovery image of the fully configured OS, with all user-installed software applications and scripts.

    a. To configure the recovery environment to boot into **a fully configured system**, users should click **Reboot Now** to close the installation environment and restart the computer. They should then proceed to the next section, **Step 2: Setting the BIOS to Boot via USB** and continue the installation of the recovery environment by continuing to **Step 3 (opt.): Creating a Custom System Image**.

    b. To configure the recovery environment to boot into a clean OS image with no applications, users should instead click **Exit** here to complete the installation and return to the OS. From within the desktop environment, the user should then manually copy the directory containing the base OS from the software DVD over to the USB drive. To do this, copy **`#:\<SoftwareDVD>\recovery\os_image`** over to the partition image directory, **`F:\home\partimag\`**. At this point, **Step 1** has been completed, and you should proceed to **Step 2: Setting the BIOS to Boot via USB**.



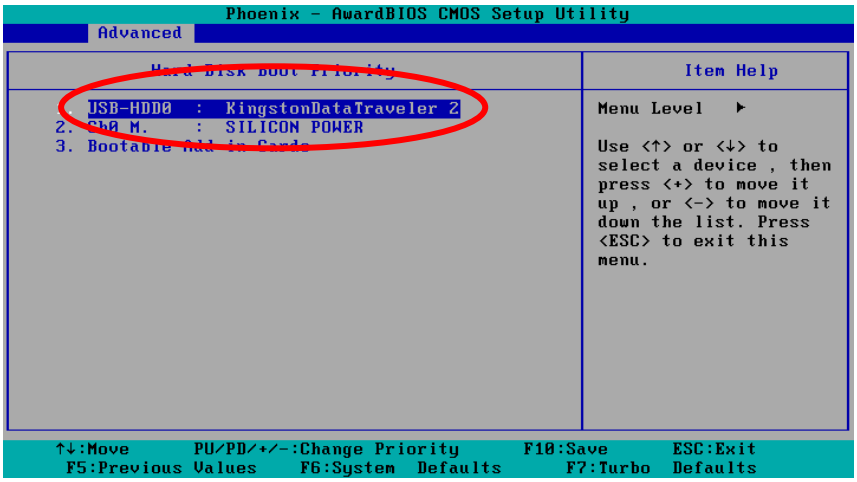
ATTENTION

Because of the peculiarities of the file tree naming, it is not possible to include both the base OS image and a fully configured system image on the same USB stick. If users wish to configure both, then two USB drives must be used, each configured according to the two different alternatives offered here.

Step 2: Setting the BIOS to Boot via USB

At this stage, users will reset the BIOS so that the system boots directly from the USB. This must be done before the rest of the system recovery environment may be configured

1. Power on and press **DEL** to enter the BIOS Setup menu.
2. Select **Advanced → Hard Disk Boot Priority** and then press **Enter**.
3. From the Setup menu, use "↑" or "↓" to select the USB device.



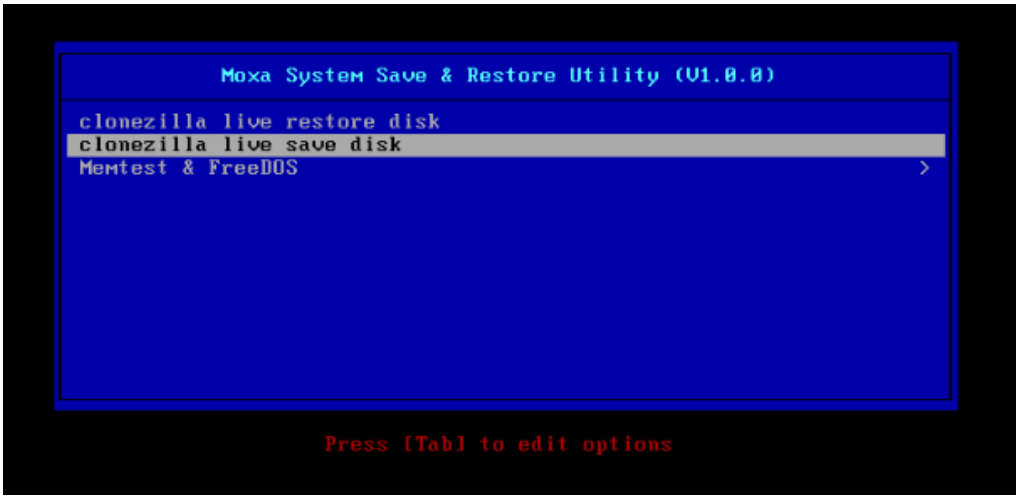
4. Press F10 and then press **Enter** to save and exit the BIOS configuration interface. This should initiate the next reboot, during which your system should now boot from the USB drive.

Step 3 (opt.): Create a Custom System Image

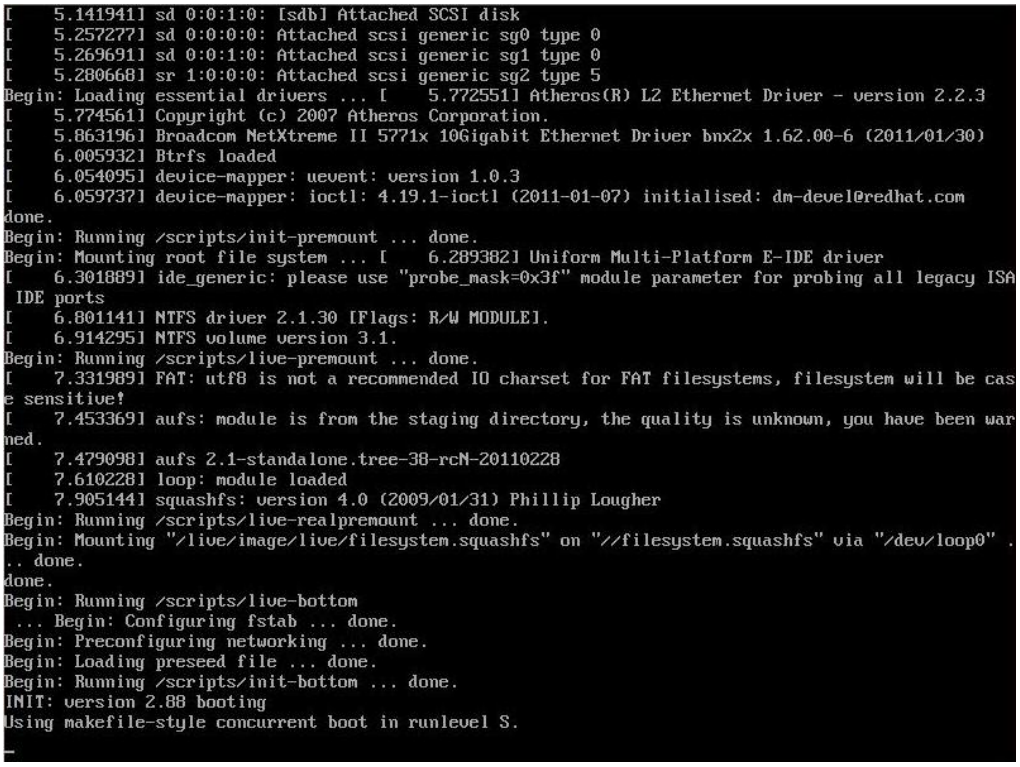
The instructions which follow are only to be used if you decided in Step 1of this process ***to create a full copy of an already-configured system***. If you have not yet installed any software on your system, then return to section 5b of **Step 1: Preparing the USB Drive** and follow the instructions to create a clean OS image.

Using this procedure, you will save to the USB drive a copy of the entire system **as it is currently configured** to be used as a **full system recovery image** should the system crash. ***All files under*** `F:\home\partimag\` ***will be overwritten***. Additionally, you should have already changed the BIOS settings to make the USB drive the first boot priority. If you have not yet reset the boot priority, first return to **Step 2: Setting the BIOS to Boot via USB**, just above, and follow the directions there.

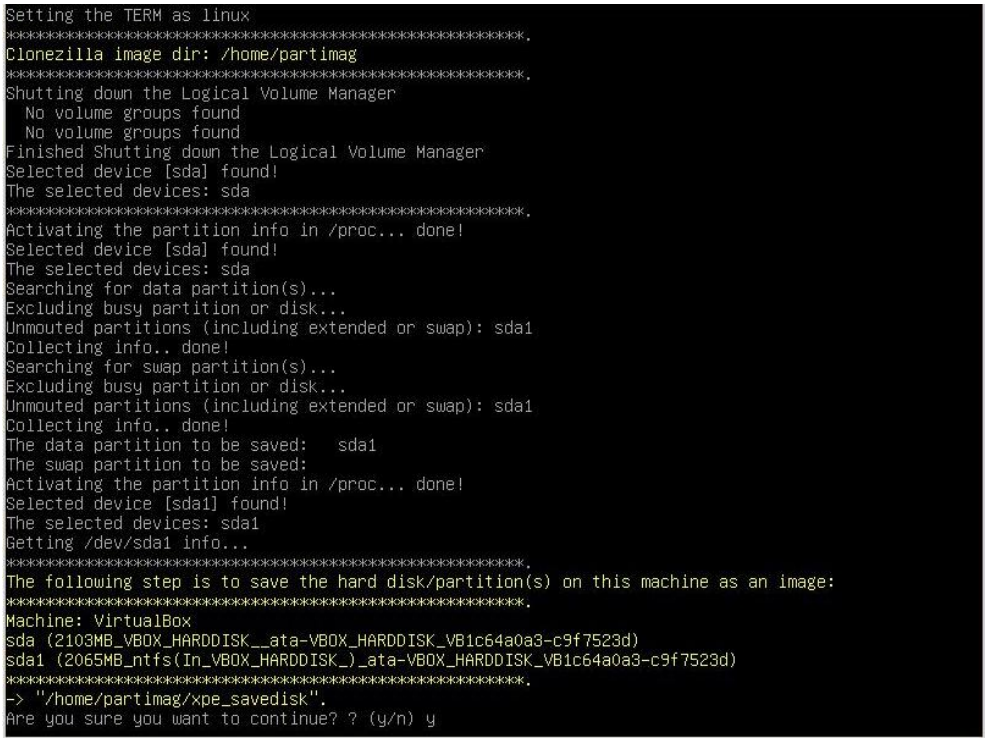
1. Once the system has launched and the V2406 has booted the recovery environment from the USB drive, navigate to the entry **ClonezillaLive Save Disk**, and select it by pressing **Enter**. This will take you into the **recovery image creation environment**, allowing you to copy your full system setup to the USB drive.



2. The V2406 will now boot into the image creation environment. Wait for the boot process to finish.



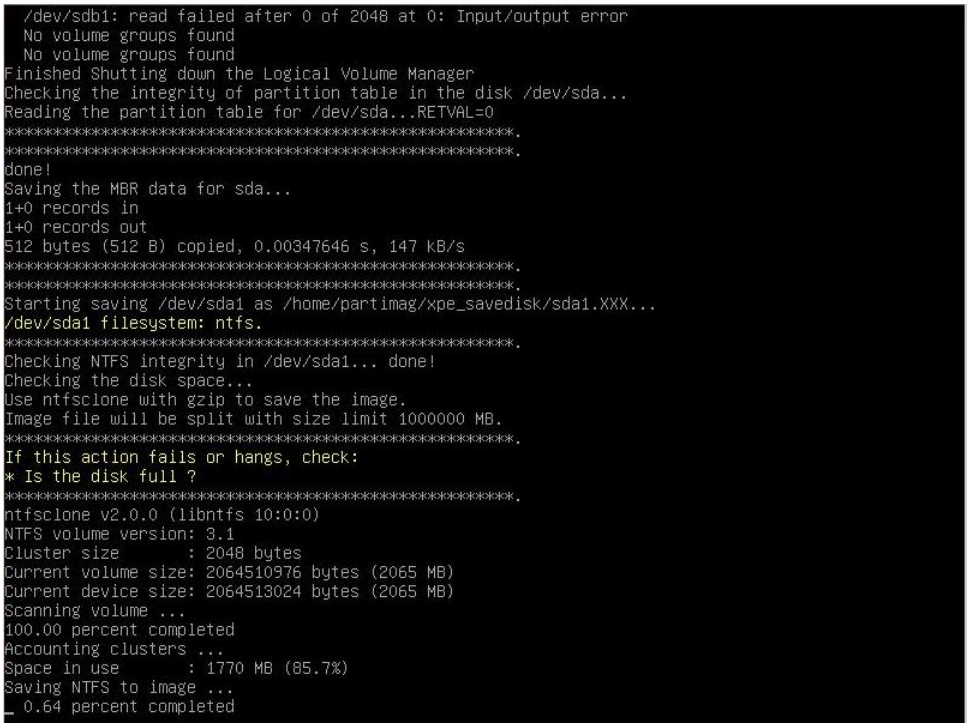
3. Once the image creation environment has completed booting up, you will be given a warning and asked if you wish to continue. Please keep in mind that if you create the recovery image, then ***any residual files currently copied to the /home/partimag directory will be deleted***. If there are any files remaining in the USB **partition image** directory and you wish to save them, you must exit the recovery environment and copy these files to another disk. If you wish to continue with the image creation, press**Y** (case insensitive) to continue.



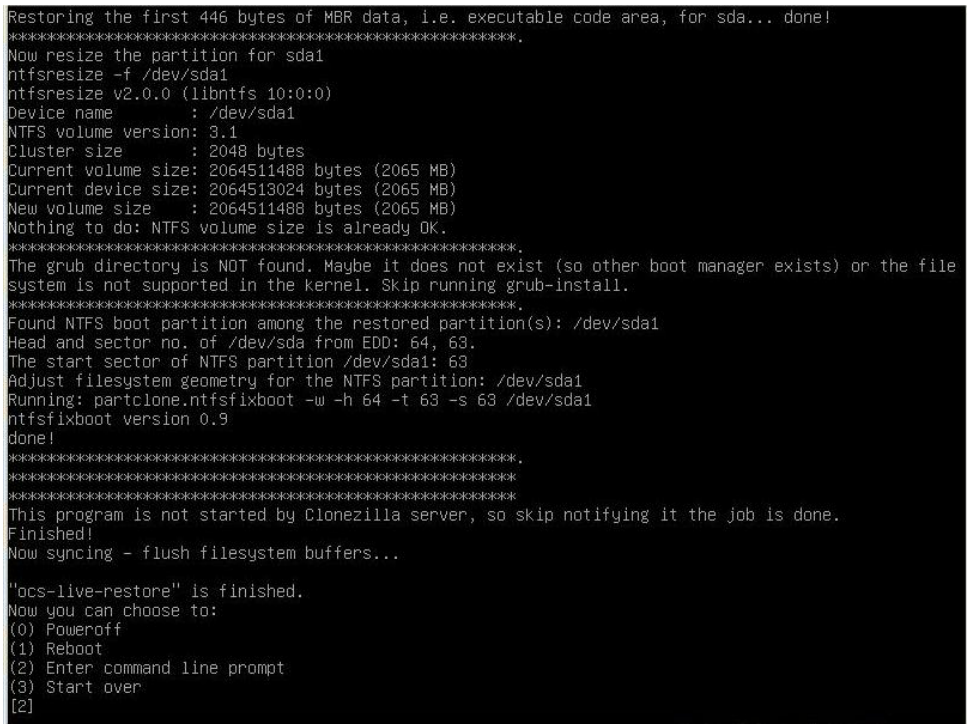
WARNING

The same filename is used for all recovery images, whether for the full system backup or for the clean OS image installation. This means that currently, it is impossible to have more than one system image per USB drive.

4. At this point, the recovery environment will copy of the entire hard drive to your USB drive. This will likely take several minutes, and perhaps as long as half an hour. Do not remove the USB drive during this time; wait patiently for the process to finish. Depending on the speed of your USB drive, this may be a good time to get a cup of coffee, or take a nap.



5. At this point you may choose to power down the computer (press **0**), reboot (press **1**), enter a console terminal (access a console TTY -- press **2**), or re-initiate the entire procedure (press **3**). ***Do not remove the USB drive until you have rebooted or powered down the system.***

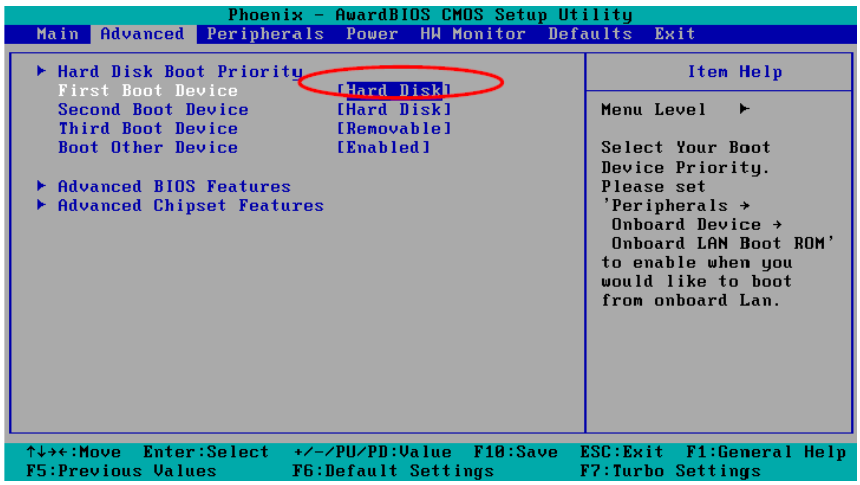


6. Once you have powered down the system and removed the USB drive, you have finished configuring the recovery environment. The USB drive should be clearly labeled and stored in a safe place. You may now continue to the next section, where you will return the BIOS to its original state (Step 4) and test the recovery procedure for successful configuration (Step 5).

Step 4: Reset BIOS to Original State

Now you will need to return the boot priority to its original configuration so that the system will boot from the original disk. This is done for two reasons; the first is security, so that the machine may not be rebooted from unauthorized USB drives The second, however, is functional: currently, if the V2406 is set to boot from the USB drive, then ***the V2406 will hang any time a USB data drive (i.e.: non-bootable image) is inserted in the machine at boot time***. The V2406 does not currently have the capacity to distinguish between simple USB data drives and boot-capable OS drives.

1. Reboot the system, and press F2 to enter the BIOS setup menu.
2. Select **Hard Disk** and shift it to the top boot priority by using the + key, then press **Enter**. Make sure the hard disk has first boot priority.

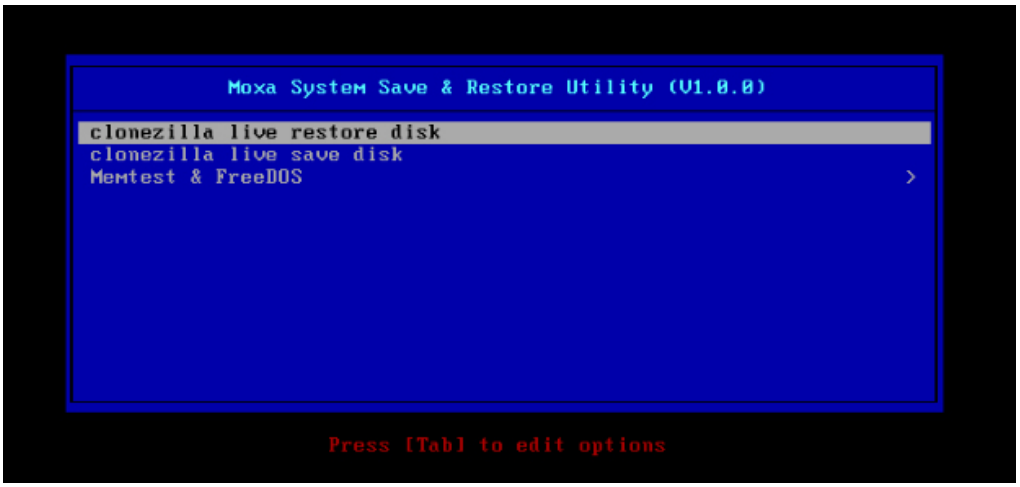


3. Press F10 and then press **Enter** to save and exit the BIOS settings dialog.

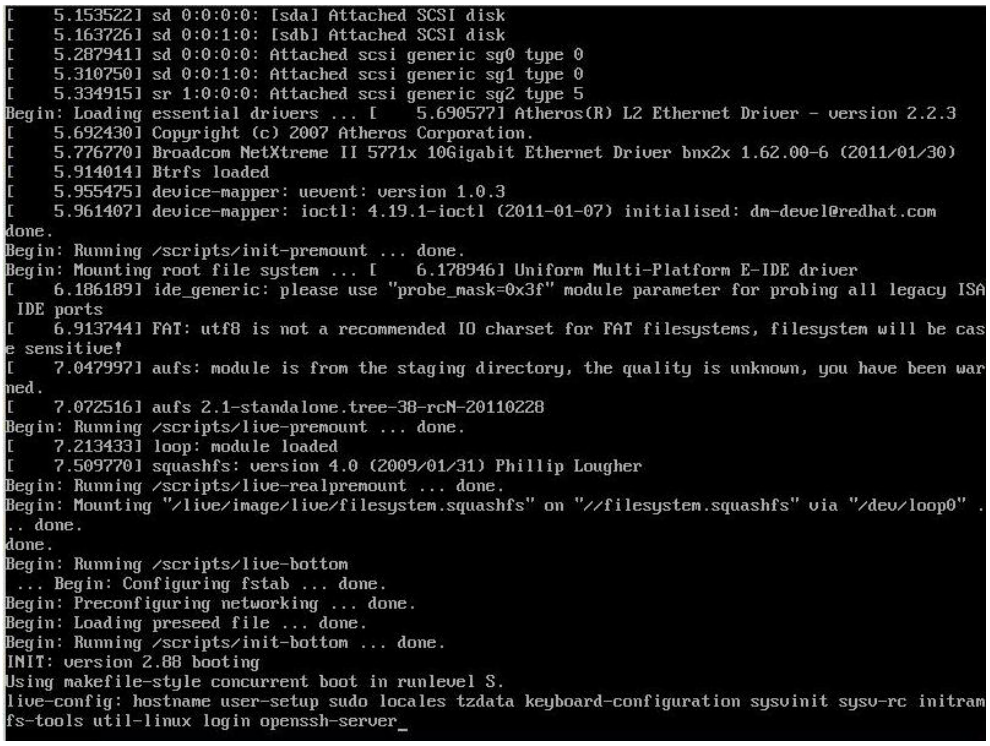
Step 5: Perform a Test Restoration

Connect the USB drive to any of the V2406's USB ports and then reboot the computer. The system will boot from the USB into the Clonezilla boot loader.

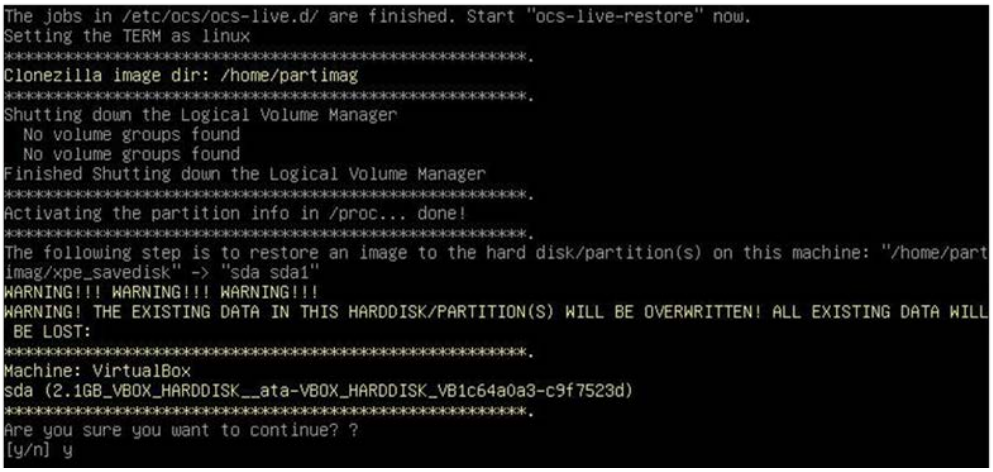
1. Select **ClonezillaLive Restore Disk** to boot into the system restoration environment.



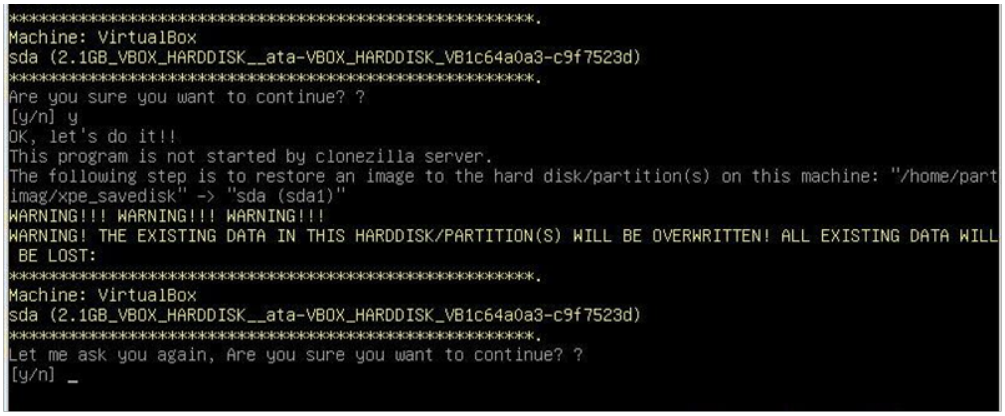
2. Wait for the boot process to finish.



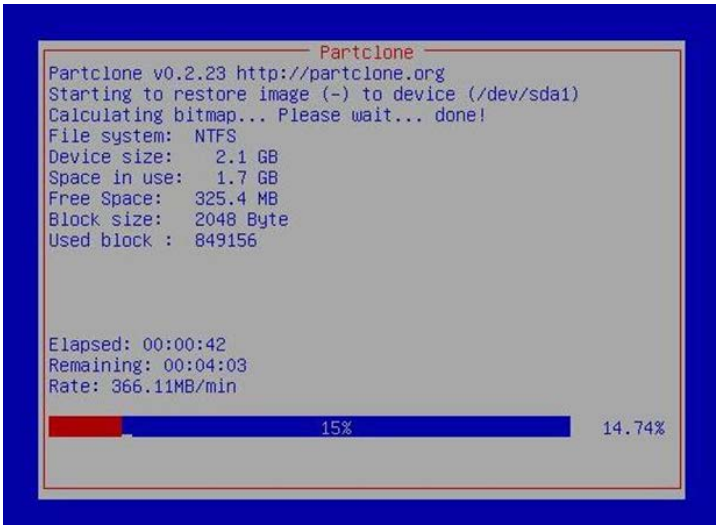
3. At this point, the system will remind you that you are about to overwrite your entire operating system with a new drive image, and ask you if you want to continue. When prompted, enter **Y** (case insensitive) from the keyboard to start the system restoration process. Any other letter or Ctrl-C will cancel it and exit Clonezilla.



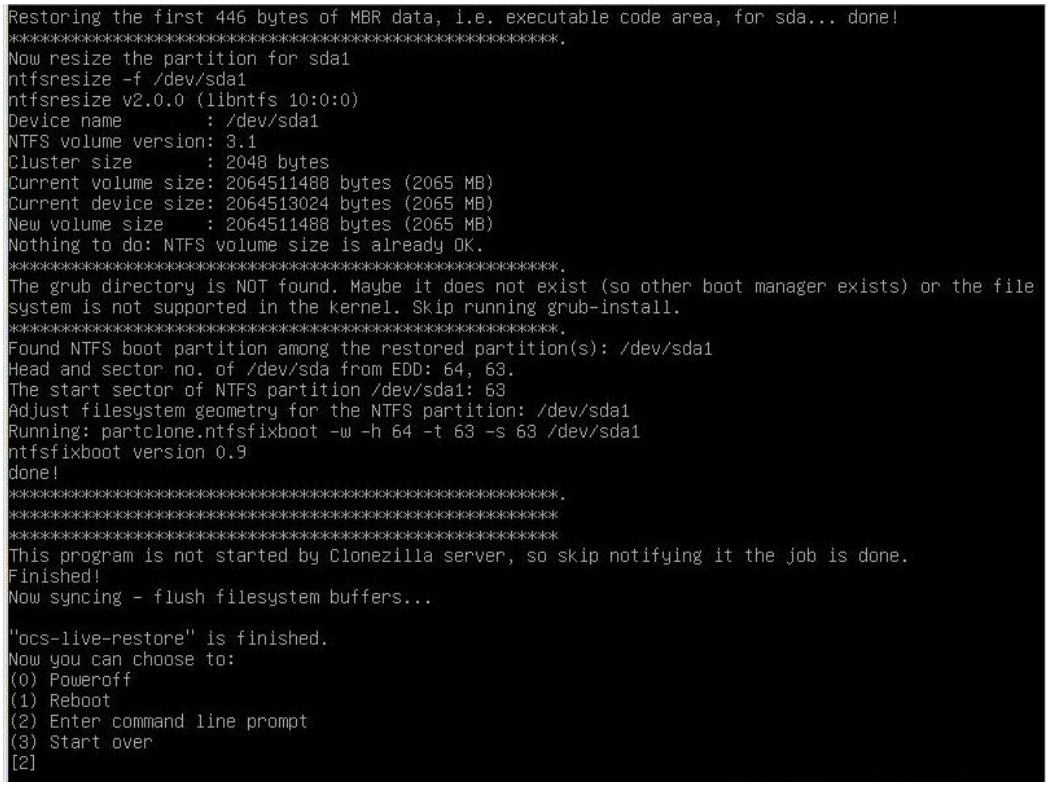
4. The system will give you another warning that you are about to overwrite your hard drive, and erase all data on the partition listed (**sda1**, in the example below). If you wish to continue, enter **Y** (case insensitive).



5. Wait for the process to finish.



6. At this point, complete the restoration by selecting (**0**) Power off. This will shut down the computer; however, if the **Power Switch** remains inserted in the front panel of the computer and is left in the **ON** position, then the system fail to shutdown and will immediately initiate a soft reboot, instead. To avoid this, users may use the switch to cut power to the computer immediately following the shutdown, or may simply remove the power switch from the front panel and then use the console to shut down the computer by pressing **0**.



7. After the computer has powered down, remove the USB drive and store it in a safe place.