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Introduction

In Windows 7, Microsoft introduced a rich set of security features which were not present in its previous generations of operating systems.

Among the new security features, most notable are:

- Execution with standard user rights: even if the user has administrator privileges, application software is executed with standard user rights by default.
- User Account Control (UAC): it is the software module that limits application software privileges to standard user privileges. When the application performs an operation that requires administrator privileges, UAC interactively asks the user to authorize a temporary increase in the level of permissions. If the user has no administrator privileges, UAC also asks for administrator credentials before proceeding.
- File system protection: users or applications without administrator rights cannot modify files in certain protected areas, e.g. the OS installation directory and the Program Files directory.
- Trusted connections: Windows 7 does not allow an application to access a shared folder on an untrusted remote host using the remote folder path, i.e. \\<remote host name>\<shared folder name>.

Backward compatibility in Windows 7 and possible solutions

Unfortunately, most of the applications that were written for Windows XP did not take into account the new set of security features (or restrictions) that the new operating systems would include.

In order to address the compatibility issues, Microsoft offers Windows 7 users the chance to run Windows XP on a virtual machine under Windows 7 without the need for a Windows XP license. This special edition of Windows XP is called XP Mode and needs virtualization software to run. Windows 7 provides a built-in virtualization software named VirtualPC.

NOTE: previous versions of VirtualPC were limited to hardware platforms that provided Hardware Virtualization (HAV) support. In March 2010 Microsoft released a patch that enabled VirtualPC to run over software virtualization, albeit with slightly worse performance. For further details:

<http://www.microsoft.com/windows/virtual-pc/support/faq.aspx>

Another solution is to use VMLite instead of VirtualPC. VMLite is a free virtualization software that does not require HAV to run, and is fully compatible with XP Mode. VMLite can be found here:

<http://www.vmlite.com>

WinNBI versions earlier than 4.0 have limited functionality in Windows 7; most features should work correctly except those related to remote file access. Nevertheless, such versions can be executed in a Windows XP

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virtual machine using one of the two aforementioned solutions. Prima Electro recommends Microsoft VirtualPC since it provides slightly better compatibility with older software such as OSAI RDK.

Pros	Cons
<i>Virtual PC</i>	
Less disk space required	Slower startup/shutdown
Better compatibility with DOS applications such as OSAI RDK	
<i>VMLite</i>	
Slightly better general performance	OSAI RDK cannot be installed
Can run in seamless mode	

WinNBI in native Windows 7

IMPORTANT:

- *WinNBI is compatible with 32 and 64 bit versions of Windows 7. WinNBI applications cannot connect to Series/10 CNCs when running on Windows 7 64 bit.*
- *PathView versions prior to 4.1.2 are not compatible with Windows 7.*

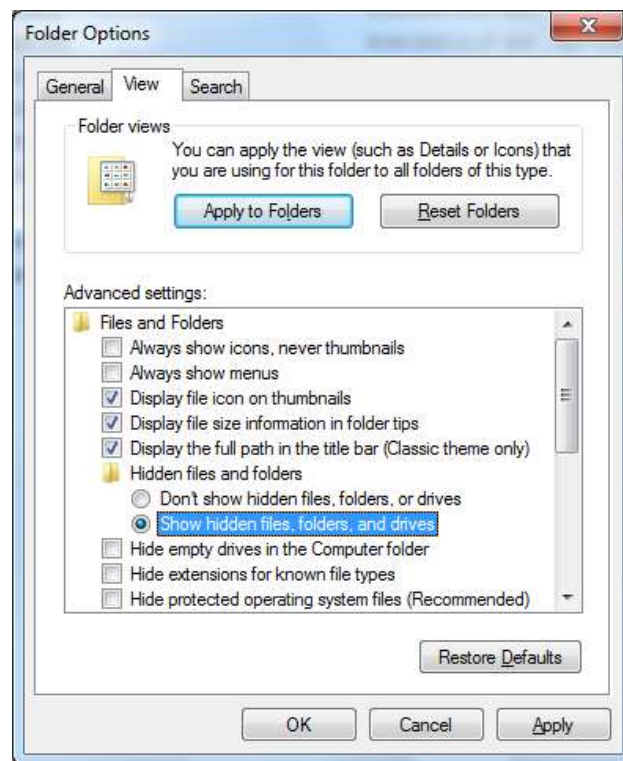
Starting from version 4.0, WinNBI is fully supported under Windows 7 32 bit, i.e. using a virtual Windows XP machine is no longer required. Windows 7 64 bit support does not include Series/10 systems. However, several modifications have been made to work around the restrictions in Windows 7.

1) User created files are now stored in the proper subdirectories of the directory:

c:\ProgramData\OSAI\WinNBI (for Windows 7)

c:\Documents and Settings\All Users\Application Data\OSAI\WinNBI (for Windows XP)

*Note: opening the above paths in Windows Explorer requires that the “hidden files and folders” option in **Folder Options** is set to “Show hidden files, folders, and drives”.*



User-created files include:

- Process Controller custom layouts created by the user (QVideo files)
- All files in the ODM offline library except the OSAI OS-Wire Motor Library.
- Oscilloscope saved traces.
- Machine Plot saved profiles.

2) Access to directories shared by CNCs of the Series/10 family is not available under Windows 7.

WinNBI applications use a proprietary protocol to transfer files between the CNC and the client system. A dynamic link library (CndexLink) is available to third party developers to access files on the CNC using the same protocol.

3) Windows 7 requires a patch to be installed in order to display online help for WinNBI programs. The patch can be downloaded here:

<http://www.microsoft.com/downloads/en/details.aspx?displaylang=en&FamilyID=258aa5ec-e3d9-4228-8844-008e02b32a2c>

4) If needed, applications can be forced to run under administrator privileges by adding a field to the manifest file. For further details:

<http://msdn.microsoft.com/en-us/library/bb756929.aspx>

Windows 7 compatibility table

See the “Series10 Compatibility Table” chapter for a full compatibility table including all Windows desktop operating systems since Windows XP.

Release	Windows 7 support	Target systems
3.1.2	XPMoDe only	Series/10
3.2.1	XPMoDe only	Series/10 - OPENControl
4.0 and later	Full support	Series/10 - OPENContro

XPMoDe for VirtualPC

The first step is to download XP Mode from the Microsoft website:

<http://www.microsoft.com/windows/virtual-pc/download.aspx>

The size of the XP Mode installation file is less than 500MB, depending on operating system and language selection. The two additional patches are less than 10MB each.

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Hardware Assisted Virtualization

Some PCs can run a VirtualPC virtual machine using hardware virtualization. This feature, if available, must be enabled by changing BIOS settings. Microsoft also provides an executable program to check whether the system supports hardware virtualization. All required information can be found here, including BIOS settings for most laptop models:

<http://www.microsoft.com/windows/virtual-pc/support/configure-bios.aspx>

If the system does not support hardware virtualization, XP Mode can still be executed using software virtualization, albeit with slightly lower performance.

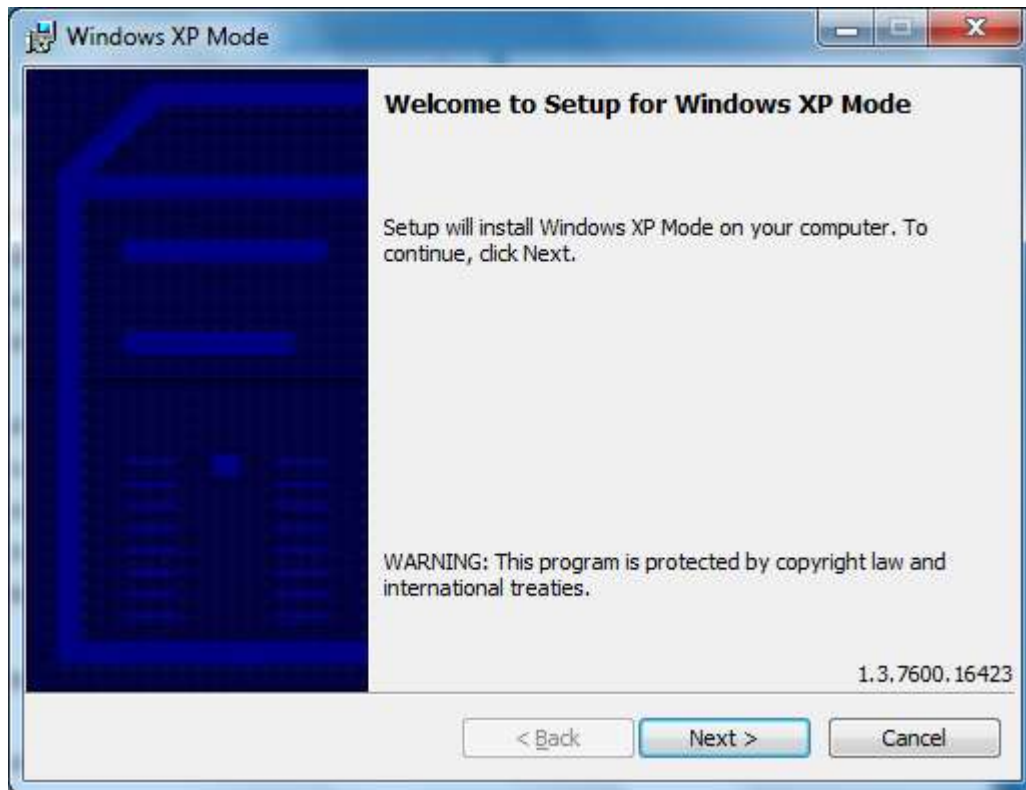
Installing XPMode

Launch the XP Mode installation executable. It is usually named WindowsXPMode_en-us.exe, but the name may vary depending on OS and language selection.

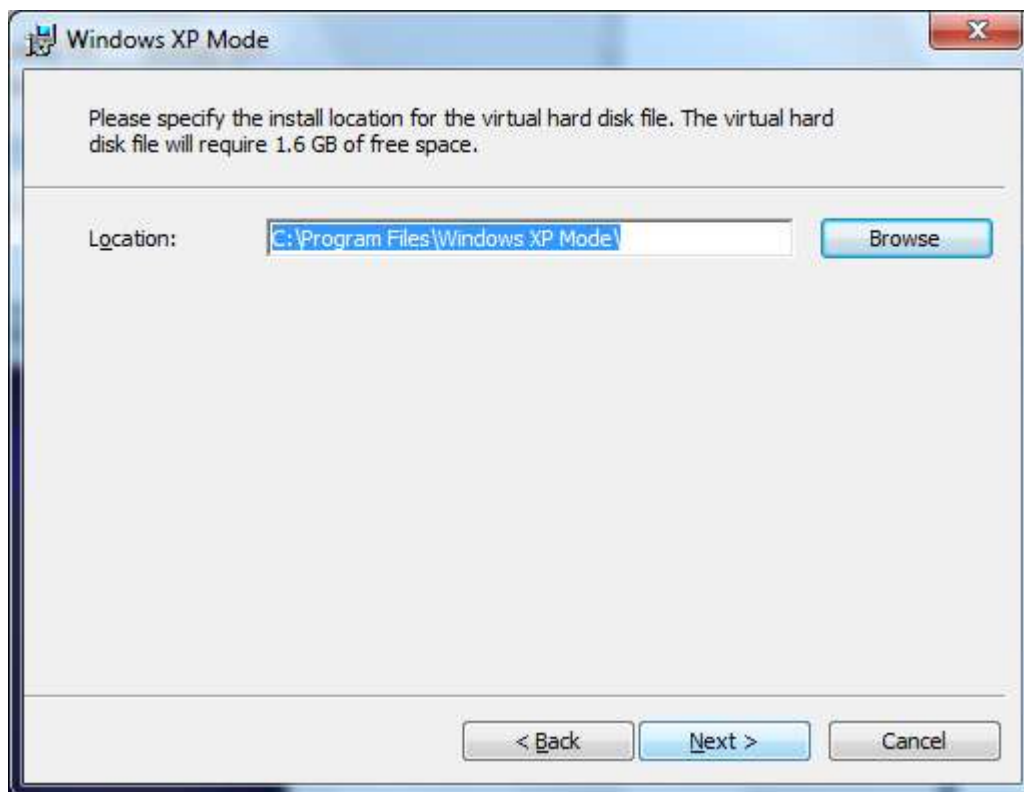


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When the installation program starts, click Next.



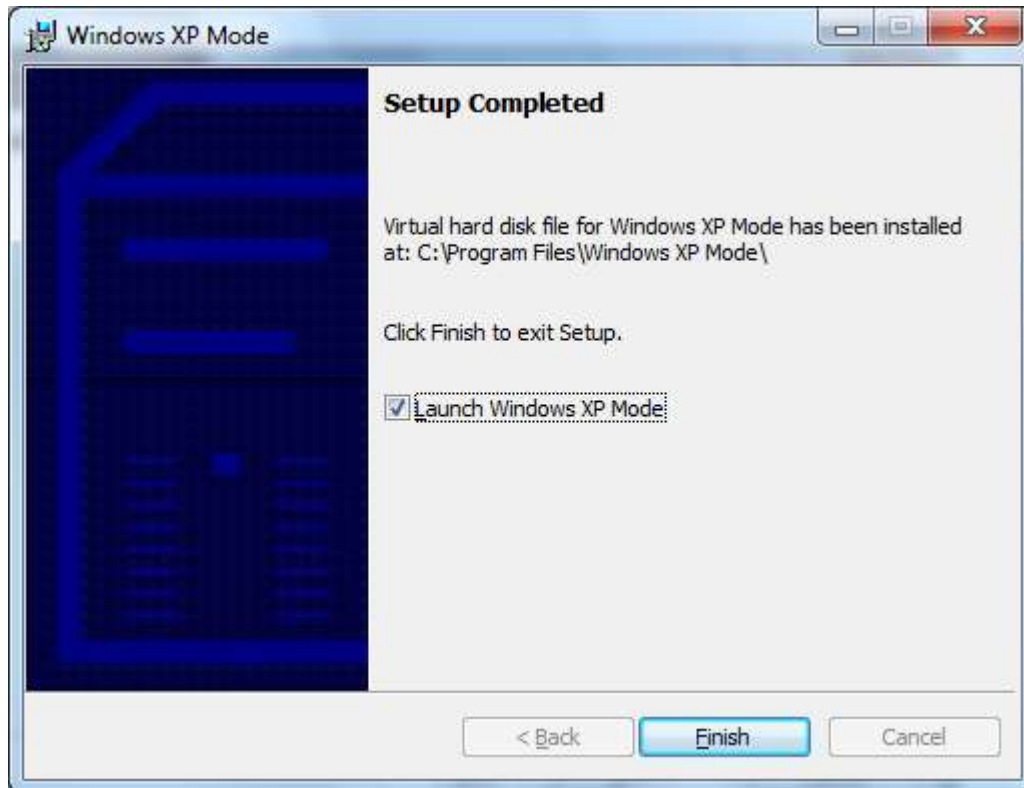
Select the installation directory, then press Next to begin installation.



Confirm the User Account Control request (administrator privileges required) then wait while XP Mode is installed on the system.



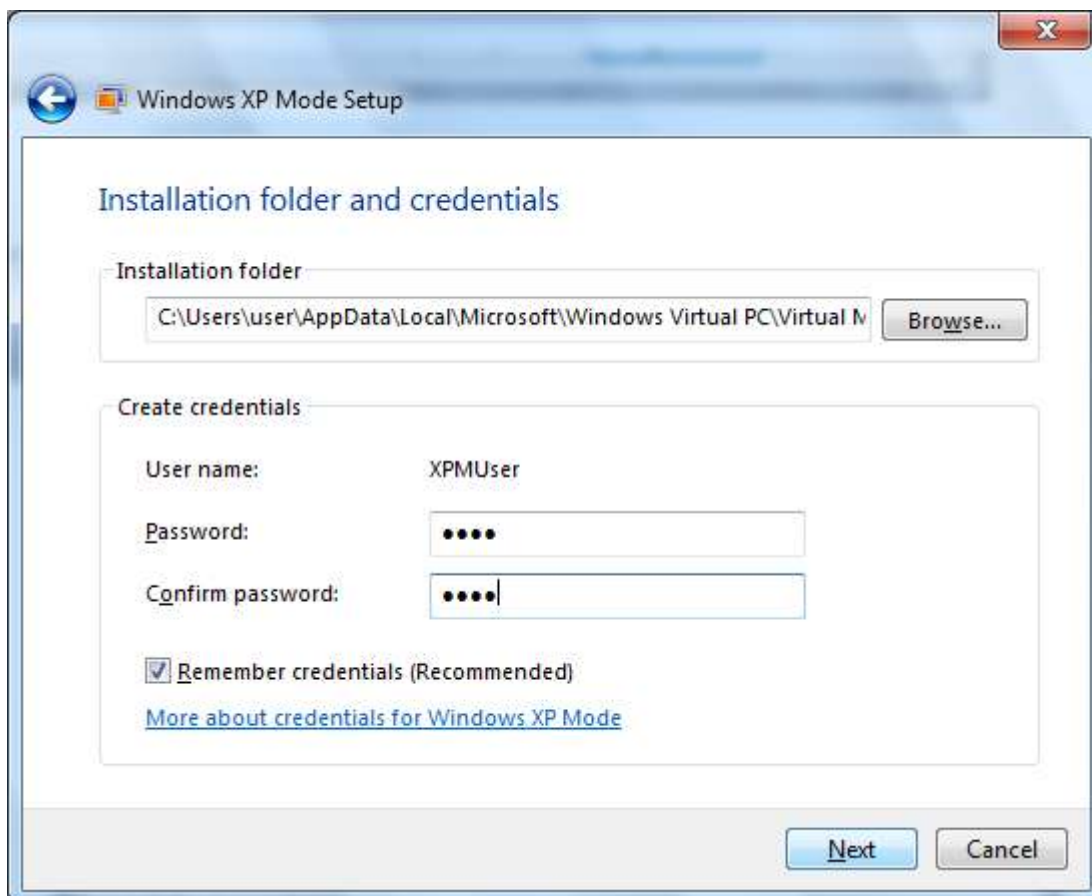
Once installation is complete XP Mode is ready for use. The first time it is launched the user will be prompted for additional configuration options.



Read the legal stuff, then check the “I accept” box and press Next.



XP Mode automatically creates a user named XPMUser. Enter a password for the user and press OK. Checking “Remember credentials” avoids the need to retype the password each time XP Mode is launched.



The screenshot shows the 'Windows XP Mode Setup' window. The title bar includes a back arrow icon and the text 'Windows XP Mode Setup'. The main content area is titled 'Installation folder and credentials'. It contains two sections: 'Installation folder' and 'Create credentials'. The 'Installation folder' section has a text box with the path 'C:\Users\user\AppData\Local\Microsoft\Windows Virtual PC\Virtual M' and a 'Browse...' button. The 'Create credentials' section has three labels: 'User name:' with the value 'XPMUser', 'Password:' with a masked input field (four dots), and 'Confirm password:' with a masked input field (four dots). Below these is a checkbox labeled 'Remember credentials (Recommended)' which is checked. At the bottom of the 'Create credentials' section is a blue hyperlink: 'More about credentials for Windows XP Mode'. At the bottom right of the window are 'Next' and 'Cancel' buttons.

Windows XP Mode Setup

Installation folder and credentials

Installation folder

C:\Users\user\AppData\Local\Microsoft\Windows Virtual PC\Virtual M Browse...

Create credentials

User name: XPMUser

Password:

Confirm password:

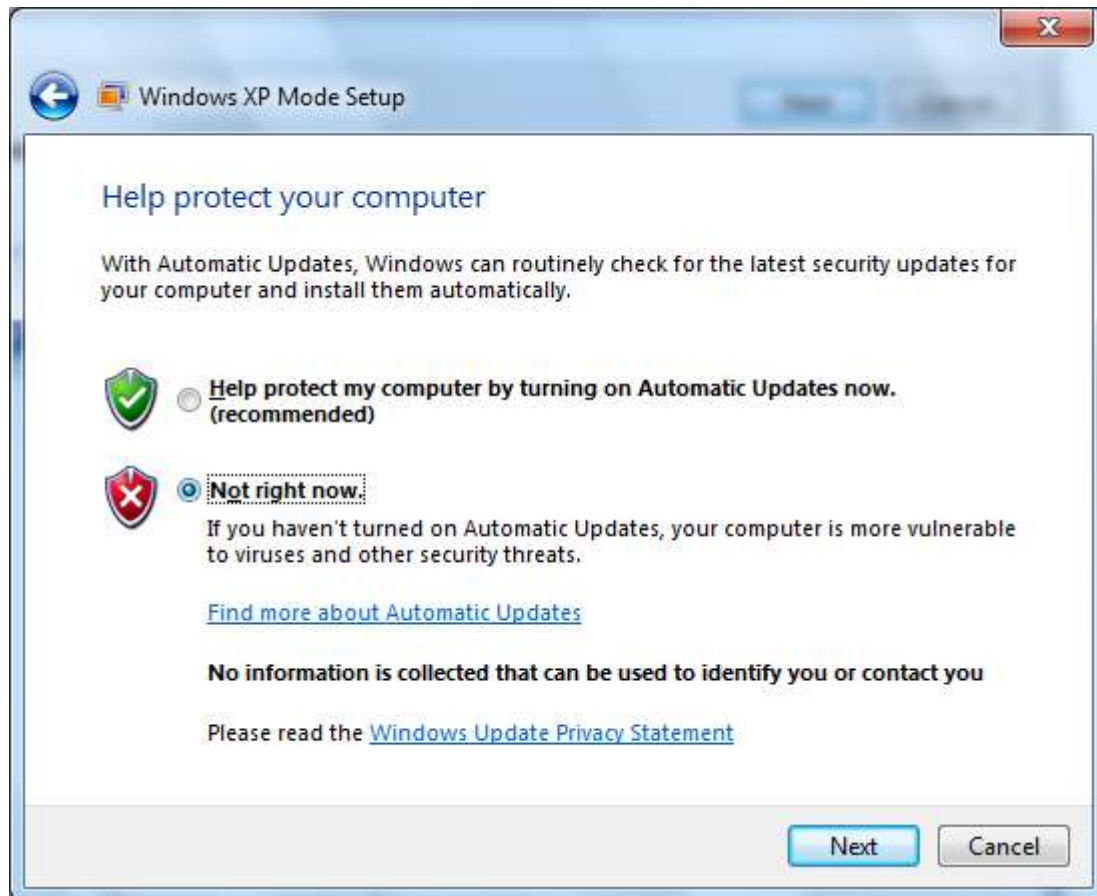
☒ Remember credentials (Recommended)

[More about credentials for Windows XP Mode](#)

Next Cancel

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Automatic Updates works in XP Mode too. You should use the same settings as the host OS.



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Select “Start Setup” to enable shared drives. Drive sharing allows the guest system (Windows XP Mode) to access the local drives of the host system (Windows 7). In XP Mode, host drives will be displayed as mapped network drives in Windows Explorer.

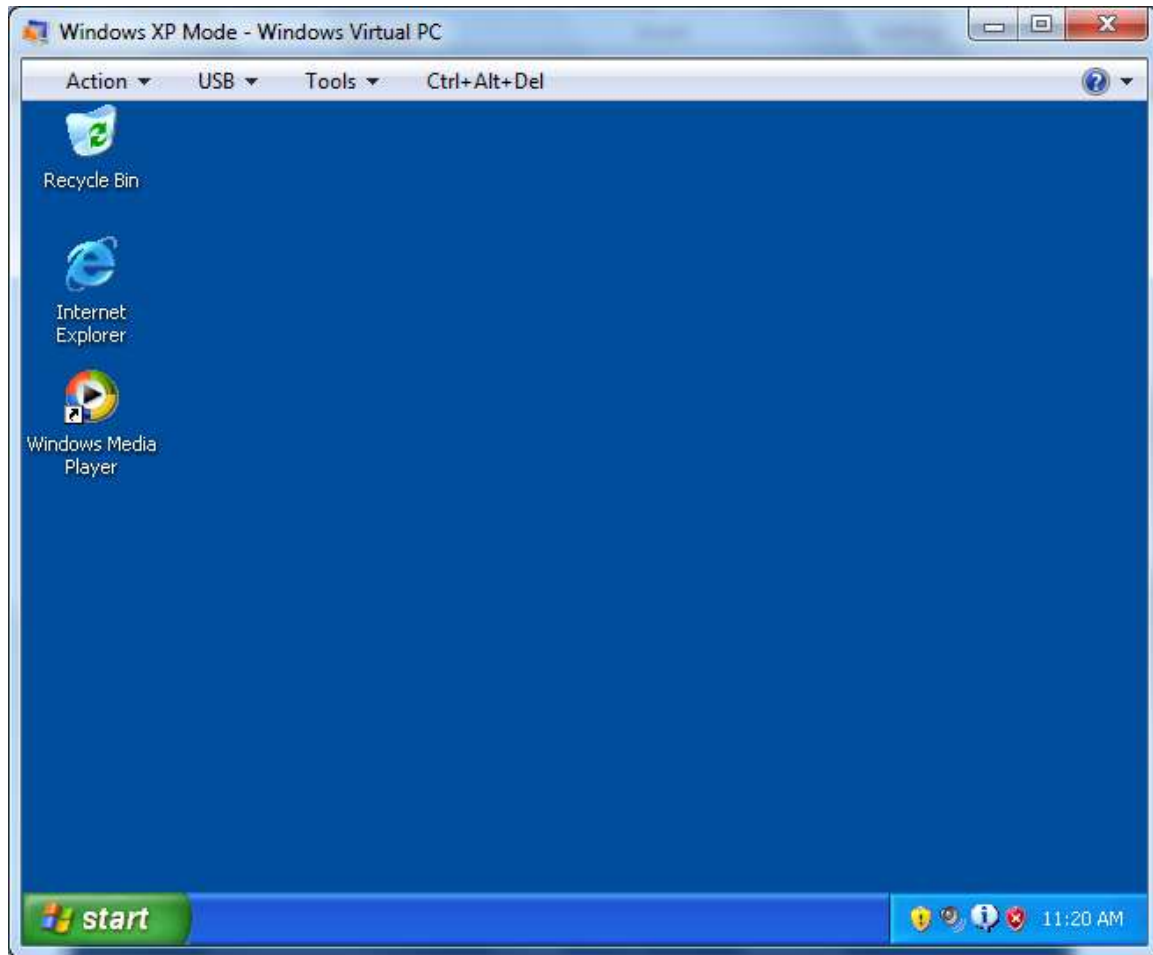


Additional setup time is required; please wait while the installer mills your hard drive a bit more...

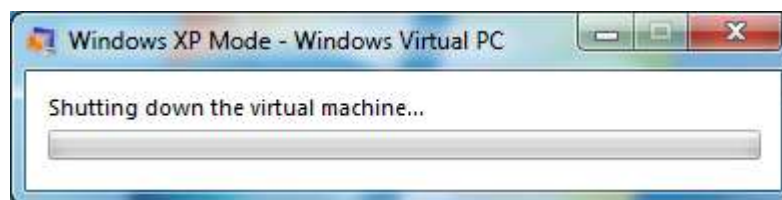


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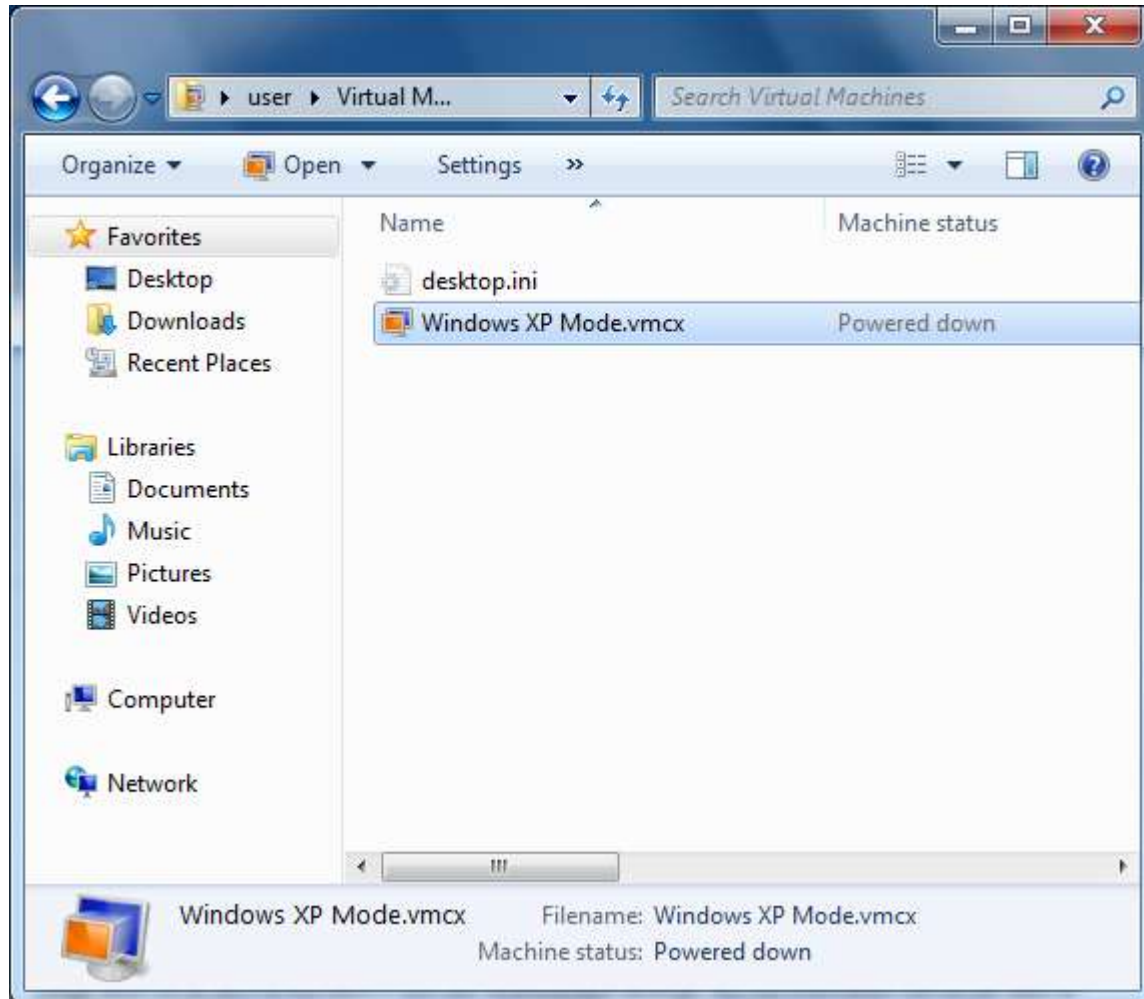
XP Mode is almost ready for use...



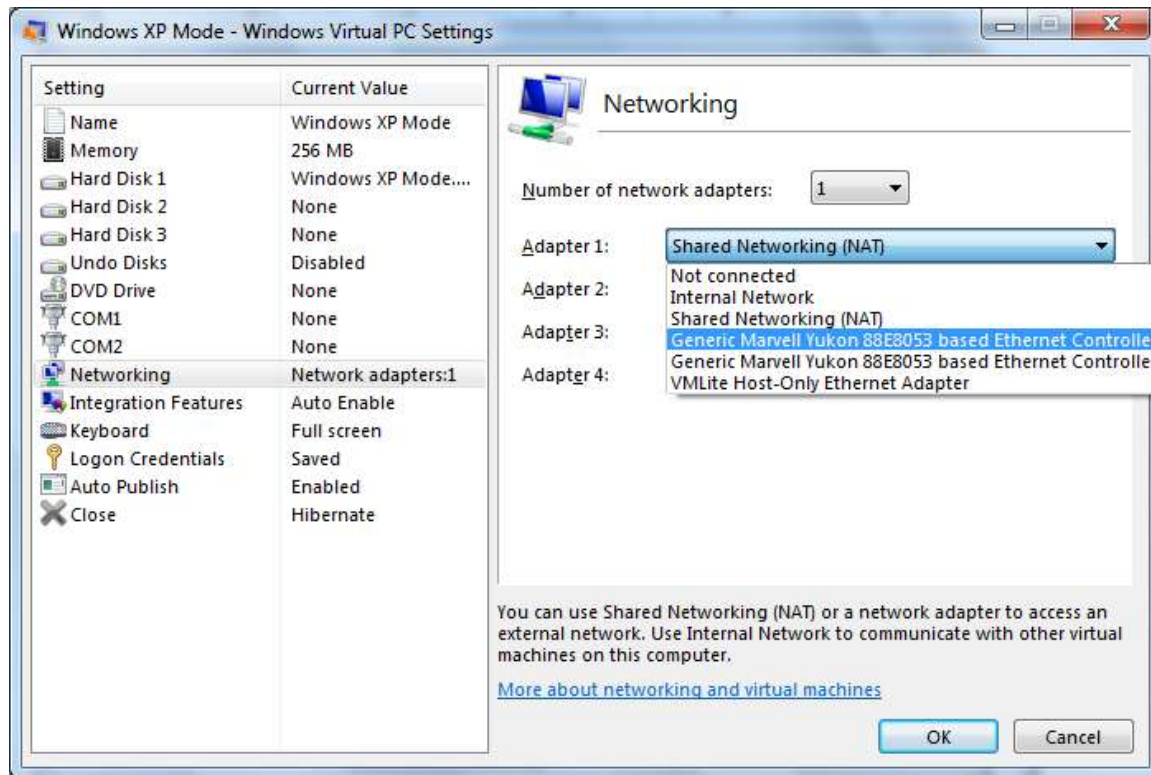
... but there are a few more settings required. Now please shut down XP Mode by pressing the Ctrl + Alt + Del button on the top bar (Ctrl-Alt-Del on the keyboard will be detected by Windows 7 and not by XP Mode) and then pressing "Shut Down".



Now open the VirtualPC panel by pressing Start -> All programs -> Windows Virtual PC -> Windows Virtual PC. The VirtualPC directory should display the XP Mode virtual machine in powered down status.



Right click *Windows XP Mode.vmcx* and select “Settings” from the popup menu. This opens the setup panel for the XP Mode virtual machine.



Select “Networking”. The default setting is Shared Networking (NAT). In NAT mode the host system acts as a Network Address Translator for the guest system, effectively hiding it from the local area network. Unfortunately, neither DCOM nor Netbeui connections can pass through NAT so we need to change it. Open the dropdown box and select the network adapter you want to use to connect to the CNC, most likely your LAN adapter, and then press OK. This will put the adapter in bridged mode, where both the host and the guest system use the same physical adapter but with two different IP addresses. This way both systems have direct access to the local area network and are visible from other systems in the network, including Prima Electronics CNCs.

XP Mode is now installed and configured. You can now start the virtual machine by double clicking *Windows XP Mode.vmcx* in the Virtual PC window.

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Installing the Netbeui protocol

The Netbeui protocol system files are distributed with both Windows XP and Windows 7 installation disks, but need to be installed manually on your system. Netbeui is not supported by 64 bit operating systems.

The installation procedure is the same for Windows XP, Windows 7 and XP Mode:

1. Go to the \Valueadd\MSFT\Net\NetBEUI folder on your Windows XP CD. If this folder is not present then you need to download the files from the Microsoft website. Whichever way you find them, you need the NBF:SYS and NETNBF.INF files to install Netbeui.
2. Copy NBF:SYS to the %SYSTEMROOT%\System32\Drivers folder. Usually %SYSTEMROOT% corresponds to C:\WINDOWS.
3. Copy NETNBF.INF to the %SYSTEMROOT%\Inf folder. Note that this folder is hidden.
4. Open the Network Connections folder (Start -> Control Panel -> Network Connections).
5. Right-click the network card that you want to add NetBEUI to and click Properties.
6. Click Install on the General tab.
7. Click Protocol and then Click Add.
8. Select NetBEUI Protocol from the list and click OK.
9. Restart your computer if requested to.

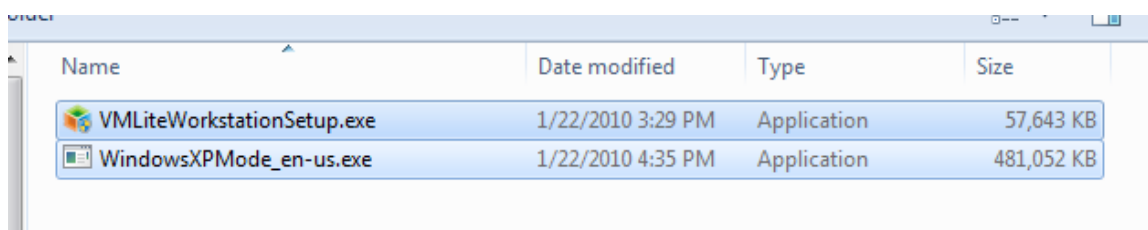
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XPMode for VMLite

VMLite is a free virtualization tool that supports Windows XP Mode under Windows 7. Although the user can choose to use either VirtualPC or VMLite, use of VMLite is not supported by Prima Electronics. Installation instructions are included in this document.

VMLite uses software virtualization.

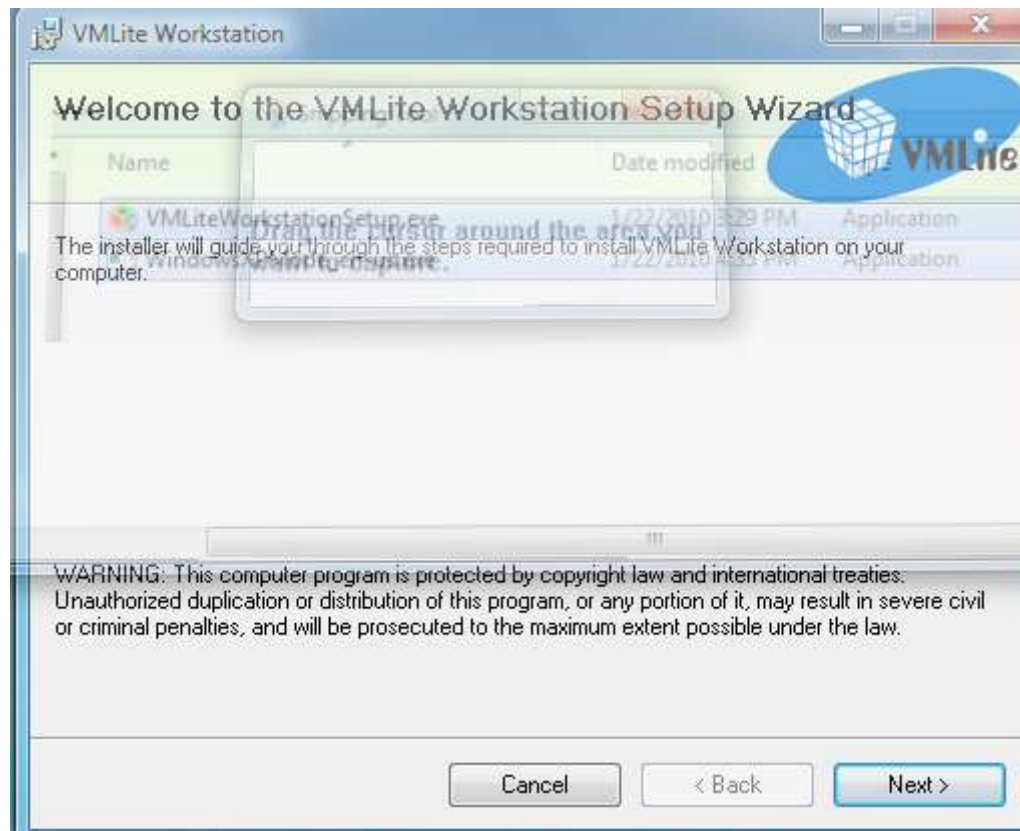
All the components needed are available to download from <http://www.vmlite.com> and <http://www.microsoft.com/windows/virtual-pc/download.aspx>.



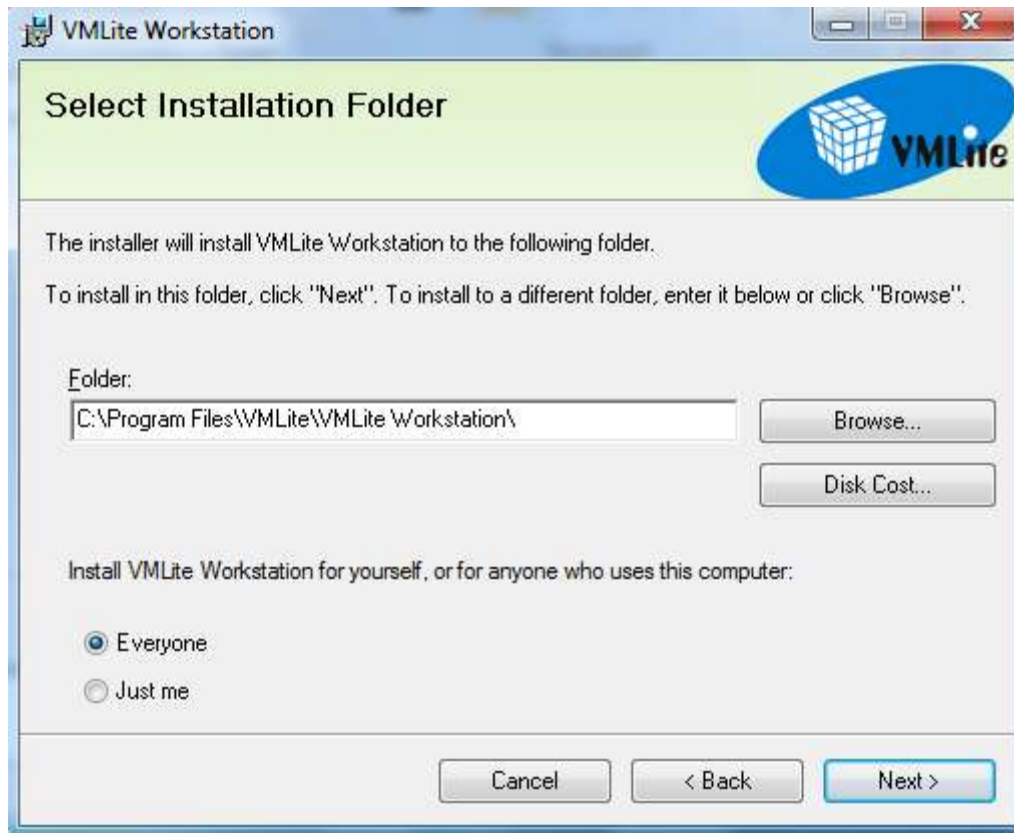
Name	Date modified	Type	Size
 VMLiteWorkstationSetup.exe	1/22/2010 3:29 PM	Application	57,643 KB
 WindowsXPMode_en-us.exe	1/22/2010 4:35 PM	Application	481,052 KB

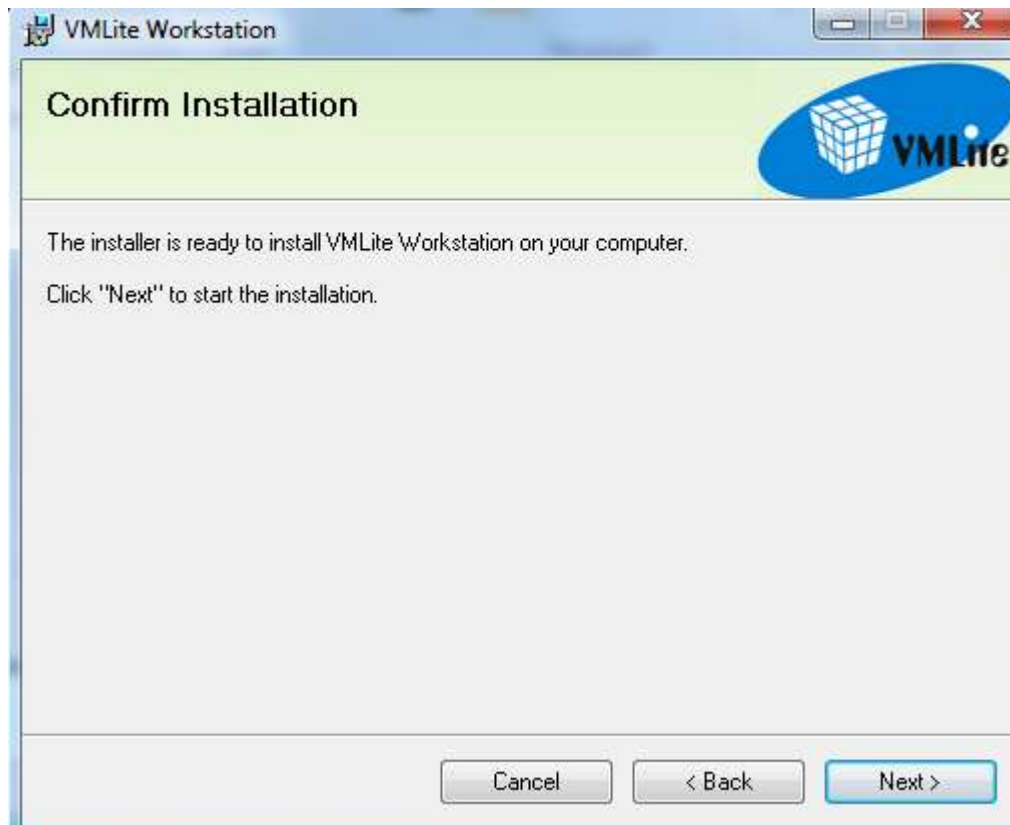
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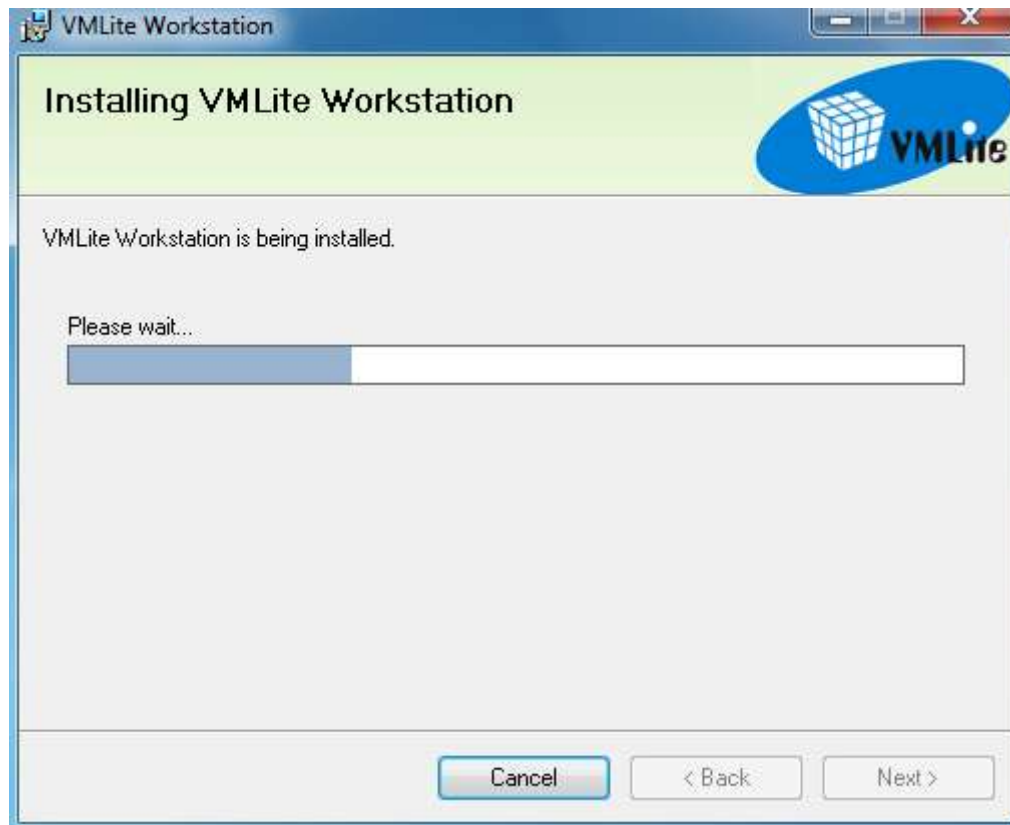
Start installing the VMLite application.



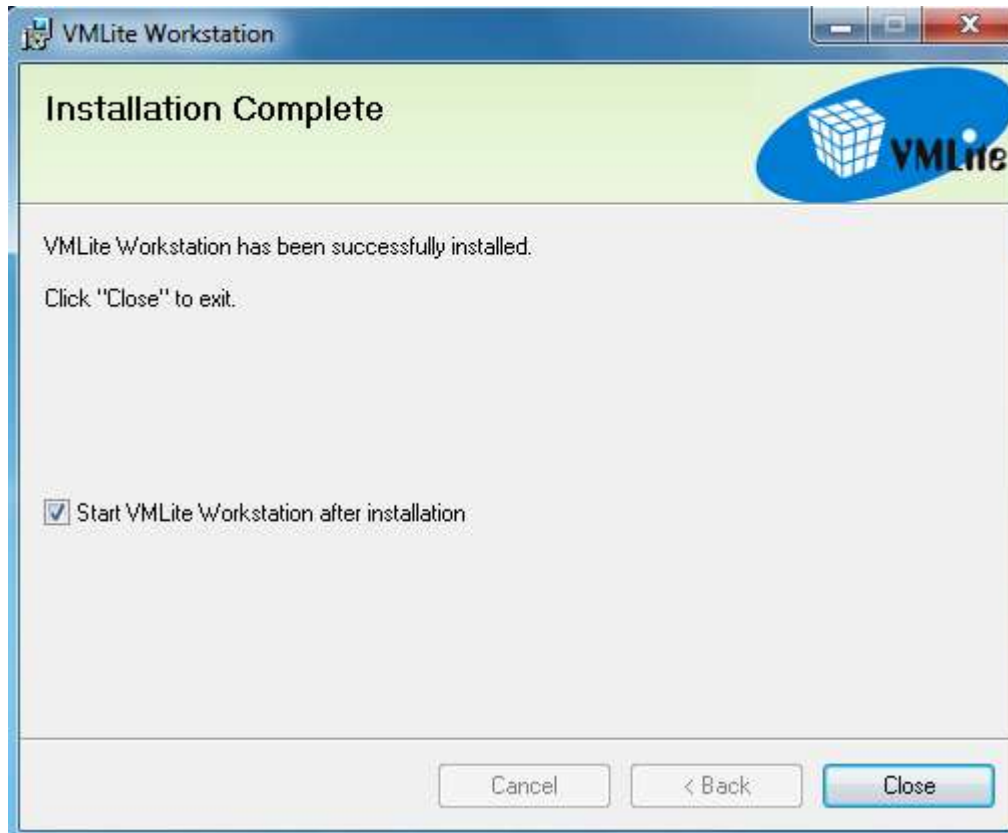








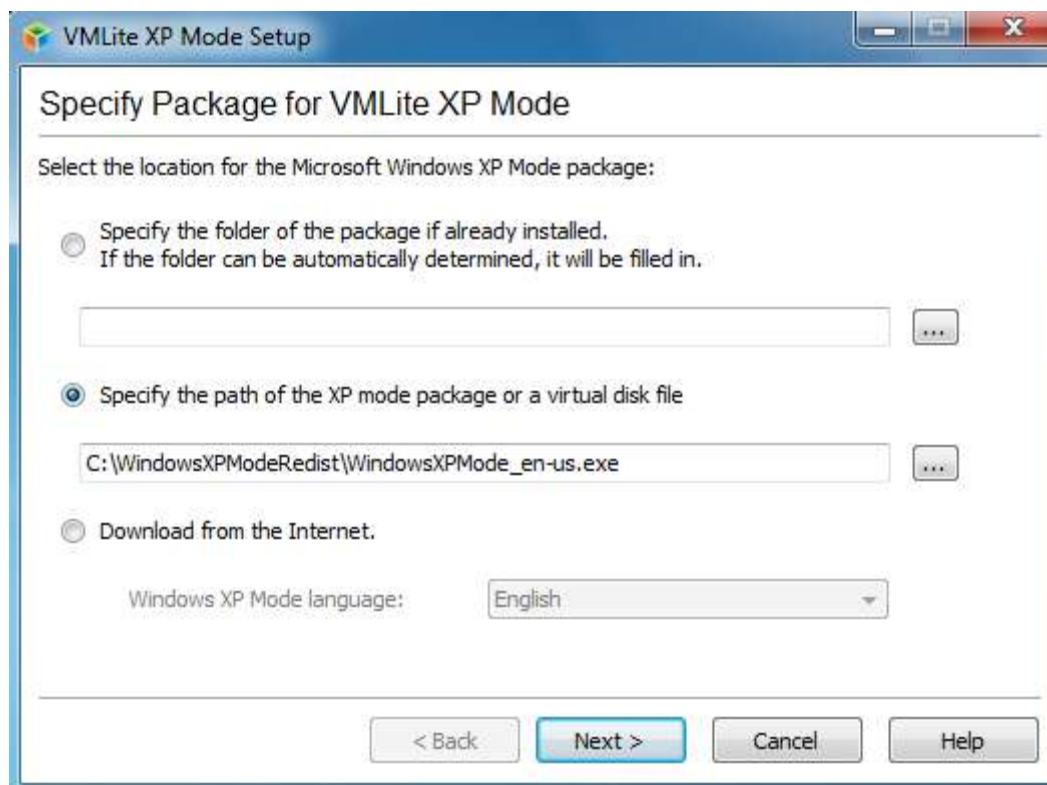


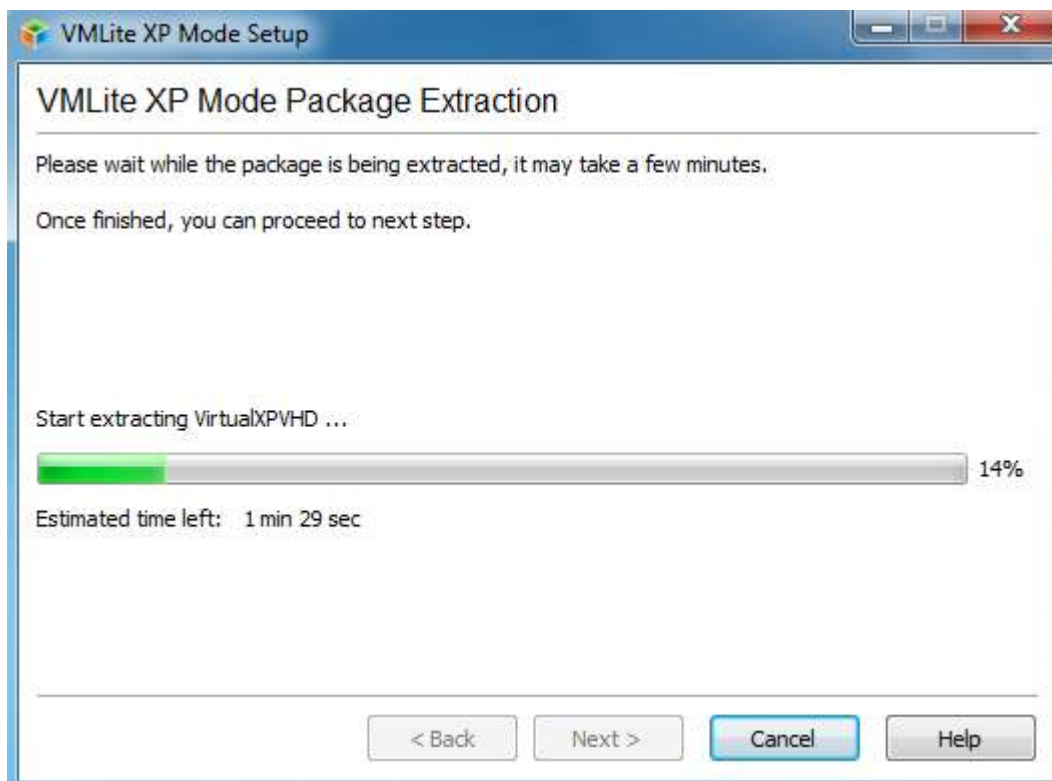
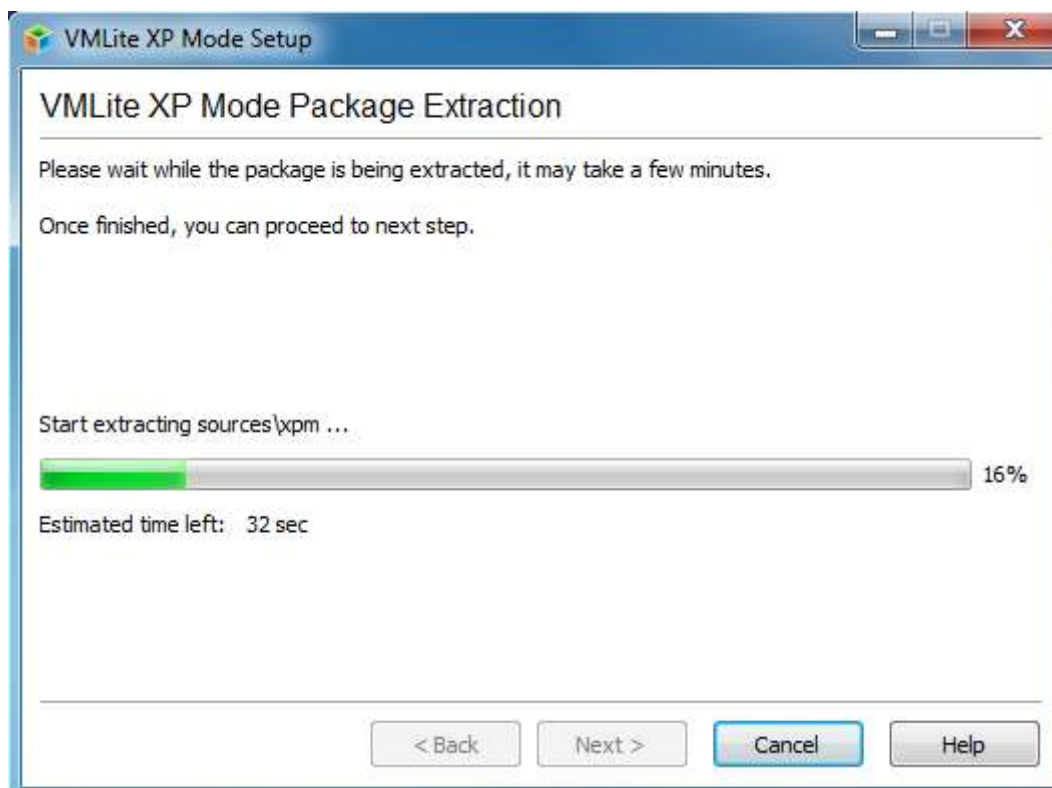


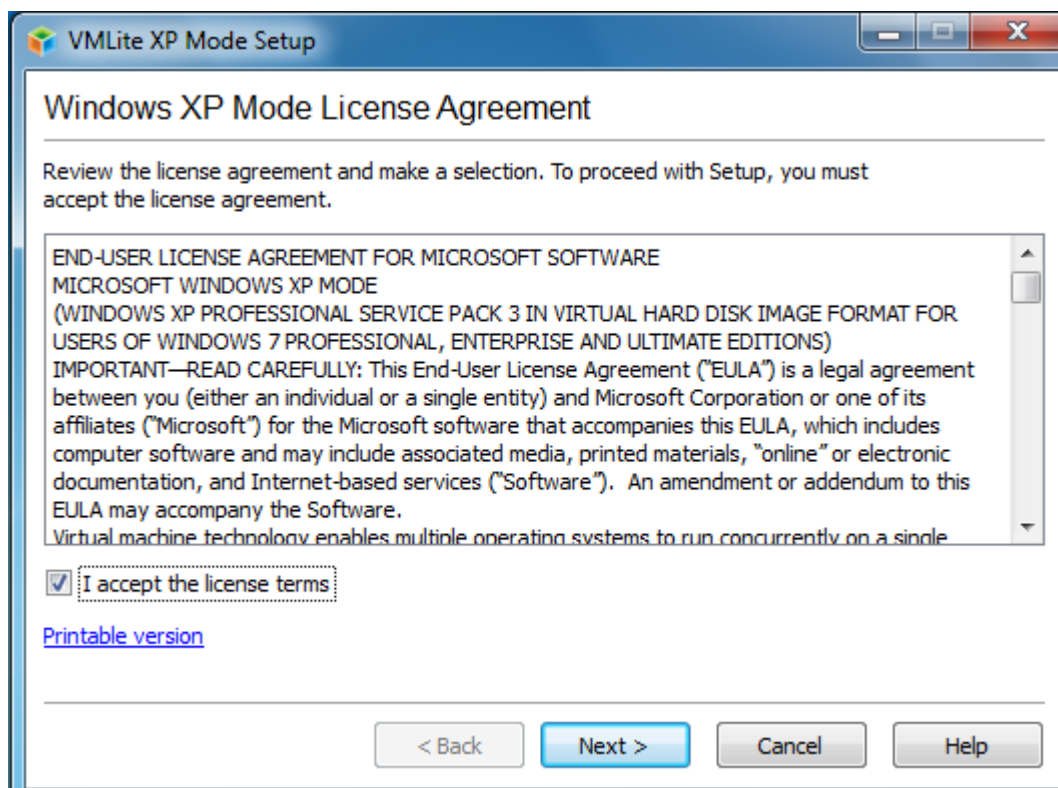
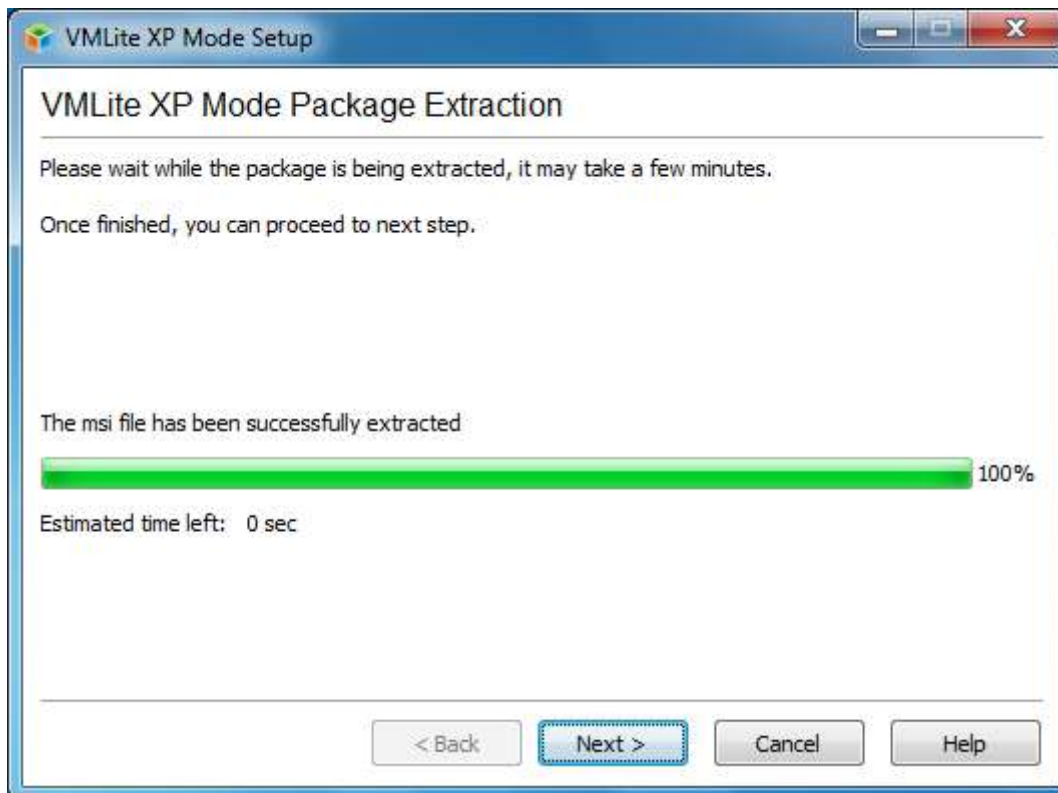
Once VMLite starts it will attempt to connect to the internet in order to download XP Mode. The following error is displayed if an internet connection is not available on the PC:

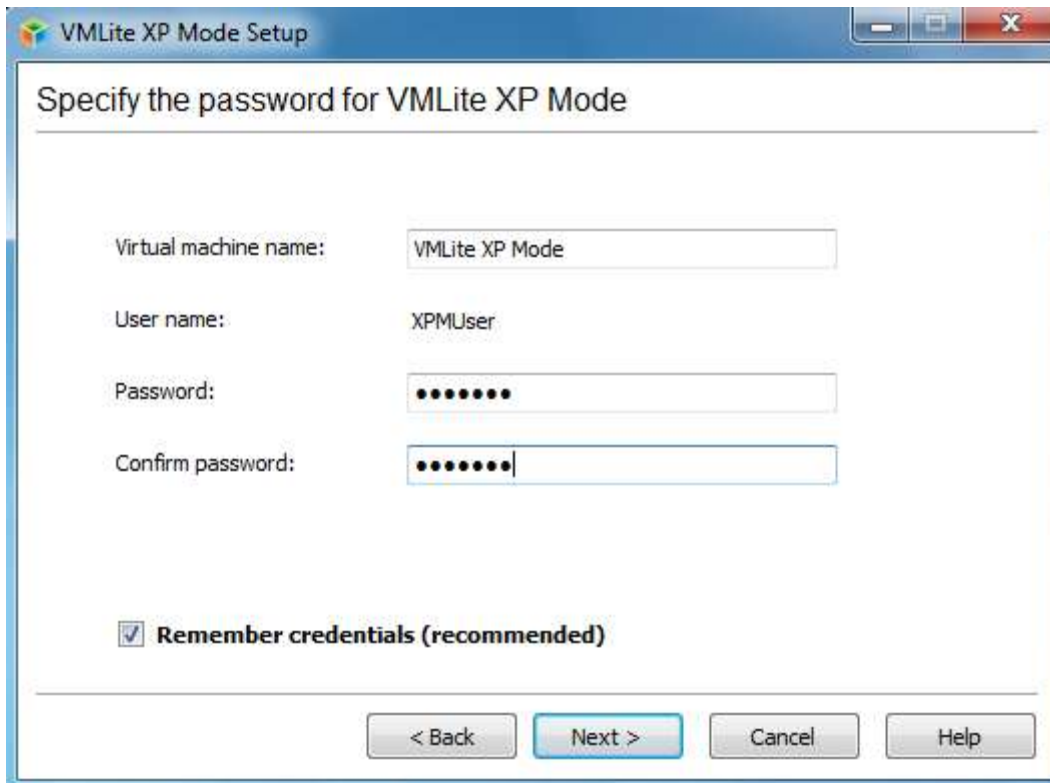


We have already downloaded the XP Mode executable so we can ignore the error and select the executable from the local drive:









VMLite XP Mode Setup

Specify the password for VMLite XP Mode

Virtual machine name: VMLite XP Mode

User name: XPMUser

Password:

Confirm password:|

☒ Remember credentials (recommended)

< Back Next > Cancel Help



VMLite XP Mode Setup

Help protect your computer

With Automatic Updates, Windows can routinely check for the latest security updates for your computer and install them automatically.

 ☐ **Help protect my computer by turning on Automatic Updates now. (recommended)**

 ☒ **Not right now**

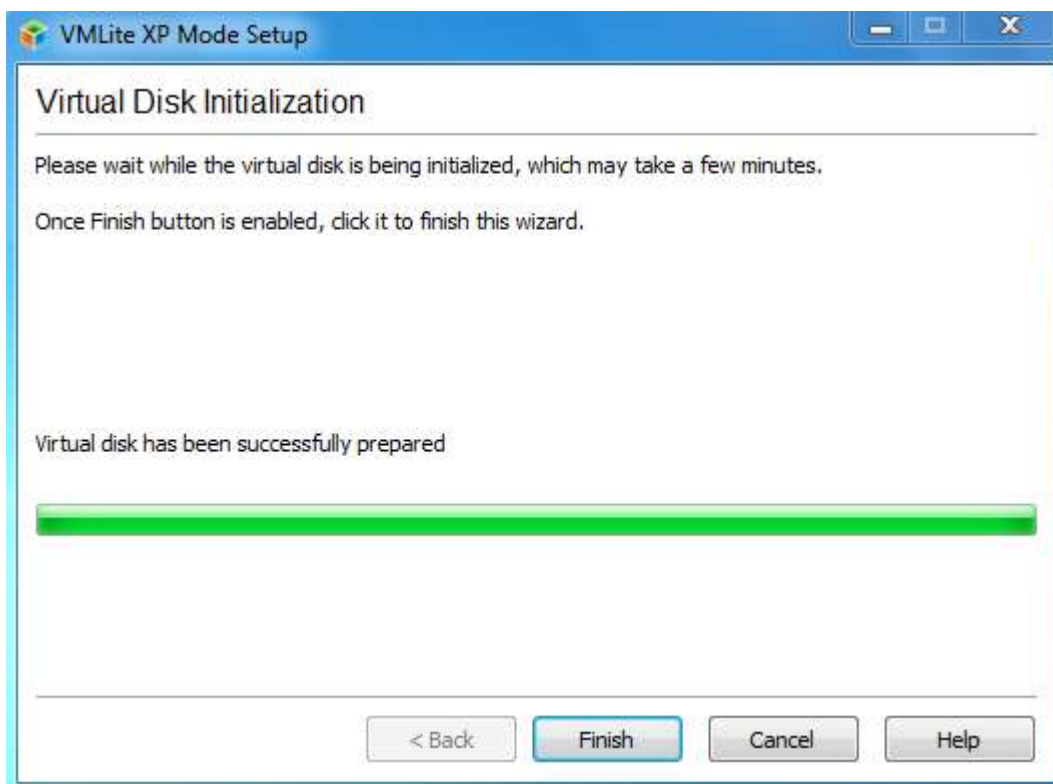
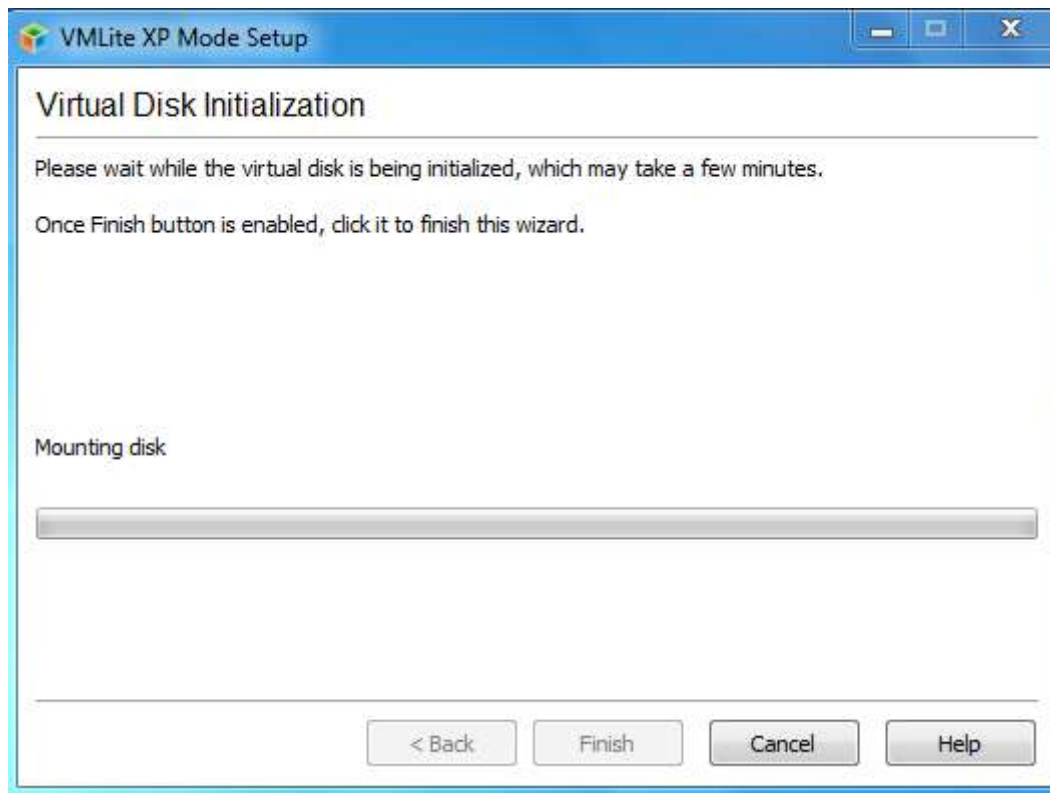
If you haven't turned on Automatic Updates, your computer is more vulnerable to viruses and other threats.

[Find out more about Automatic Updates](#)

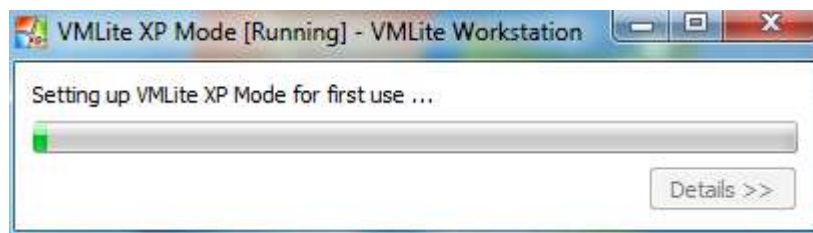
No information is collected that can be used to identify you or contact you

Please read the [Windows Update Privacy Statement](#)

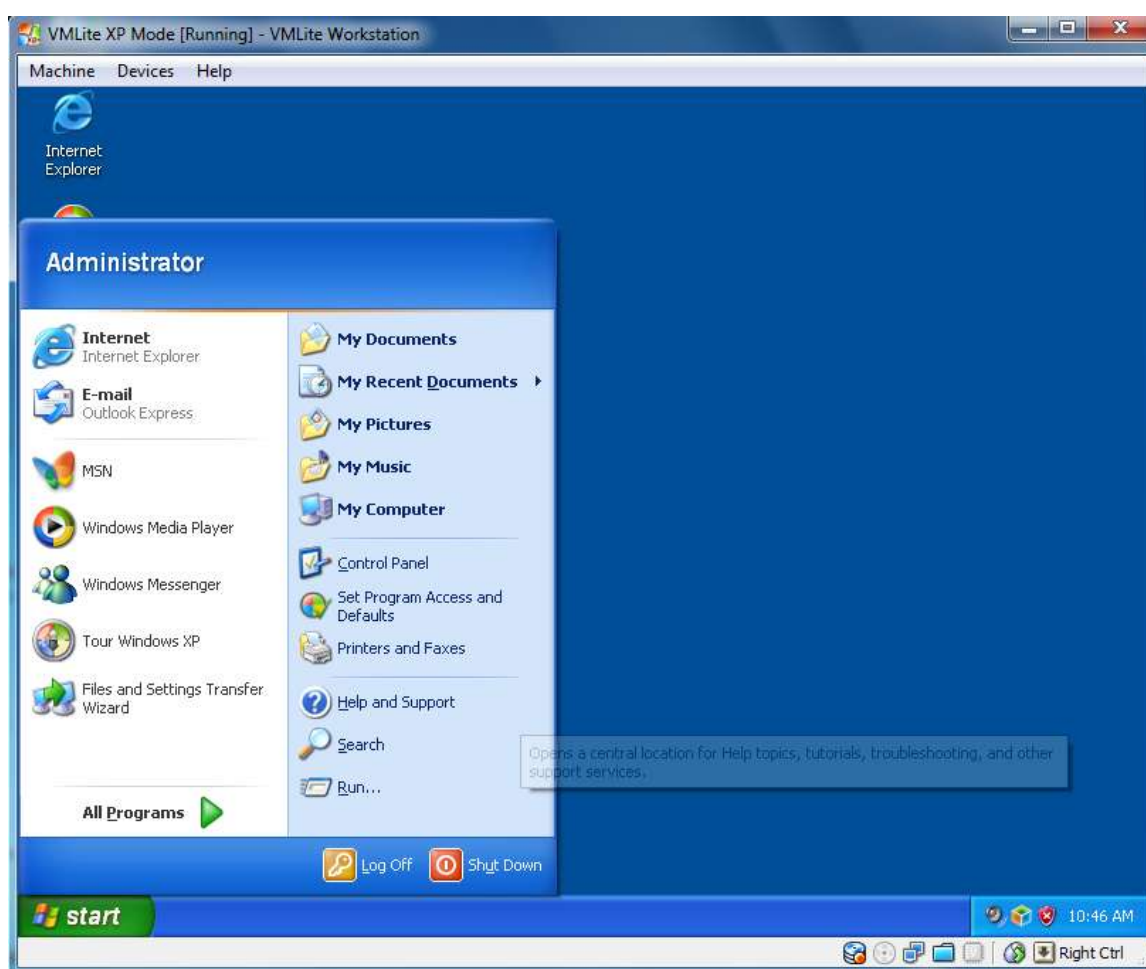
< Back Next > Cancel Help



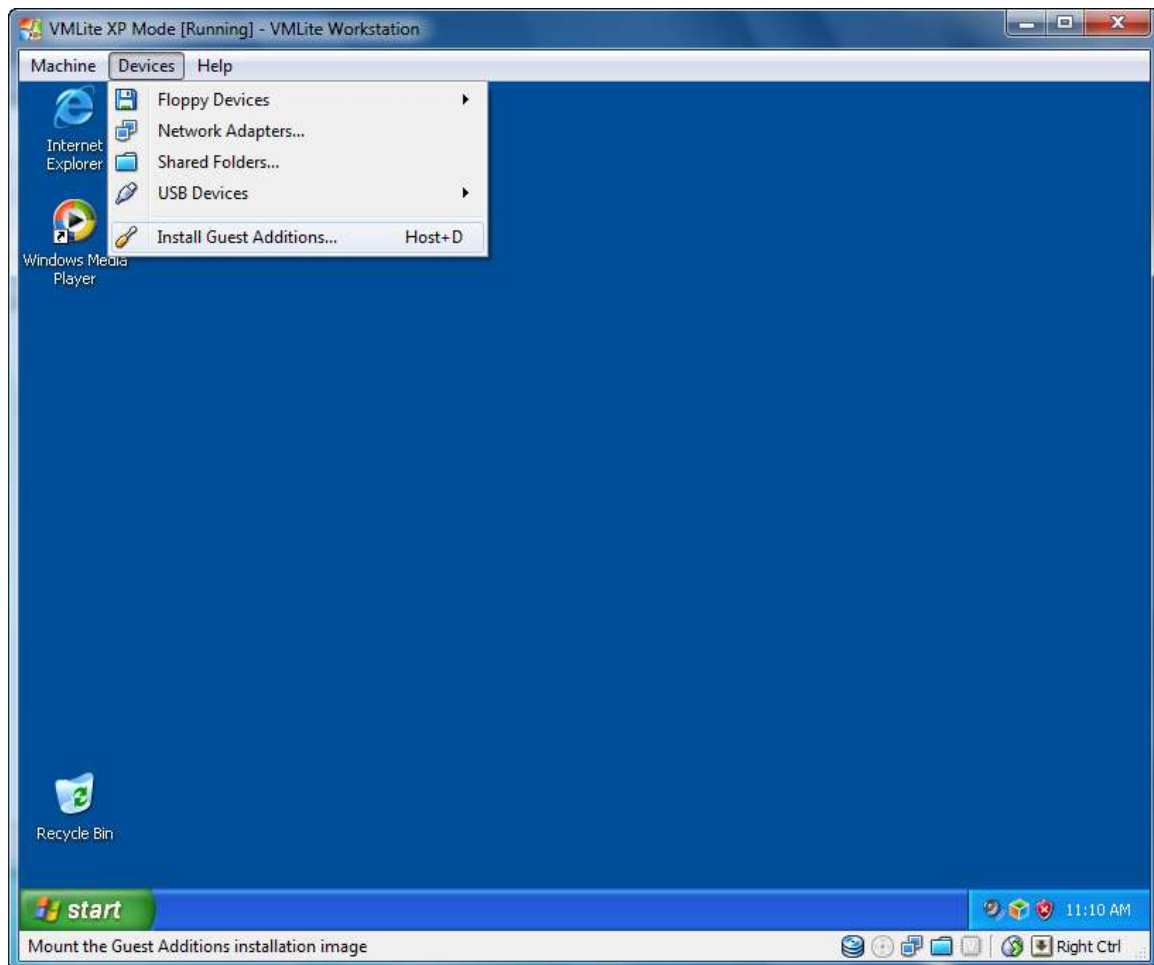
XP Mode is running for the first time and is initializing:

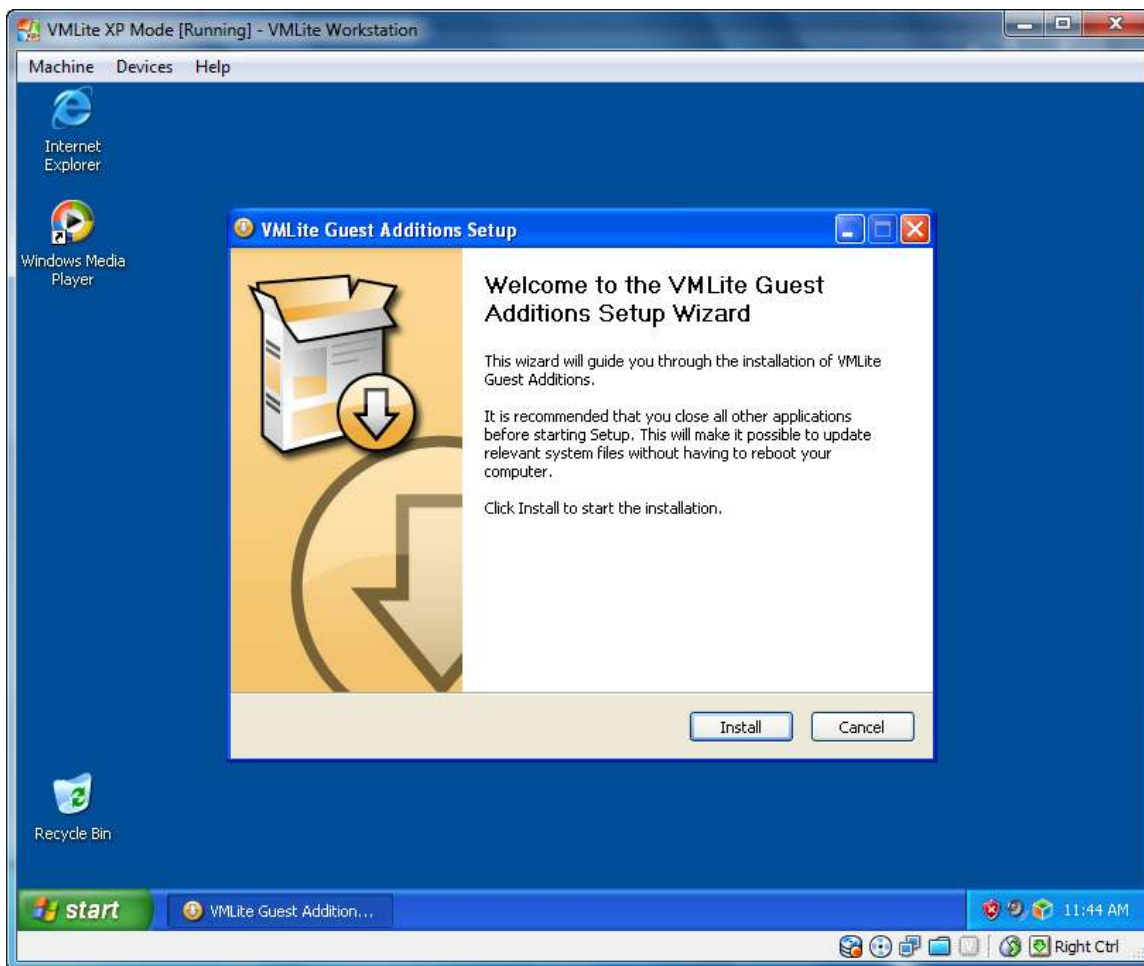


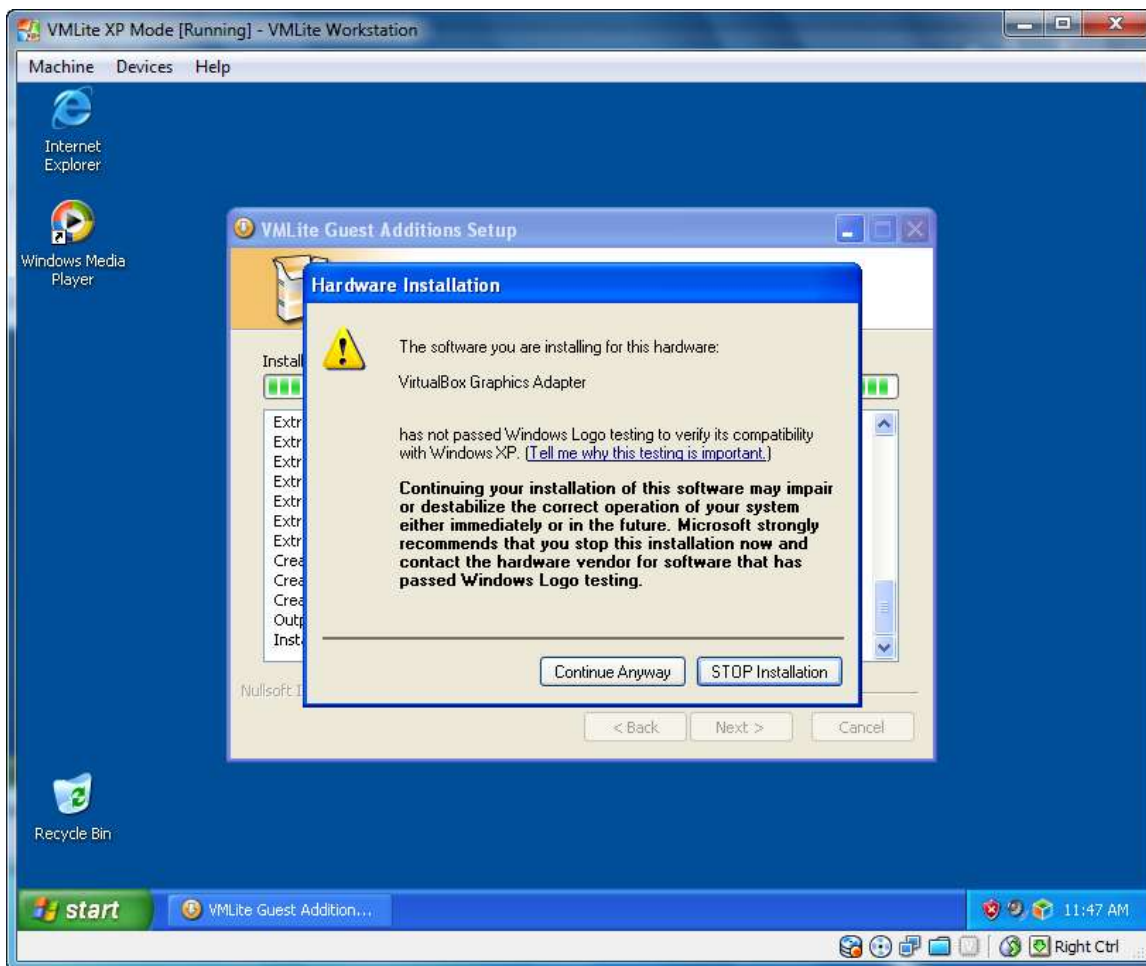
XP Mode is ready as guest O.S.:

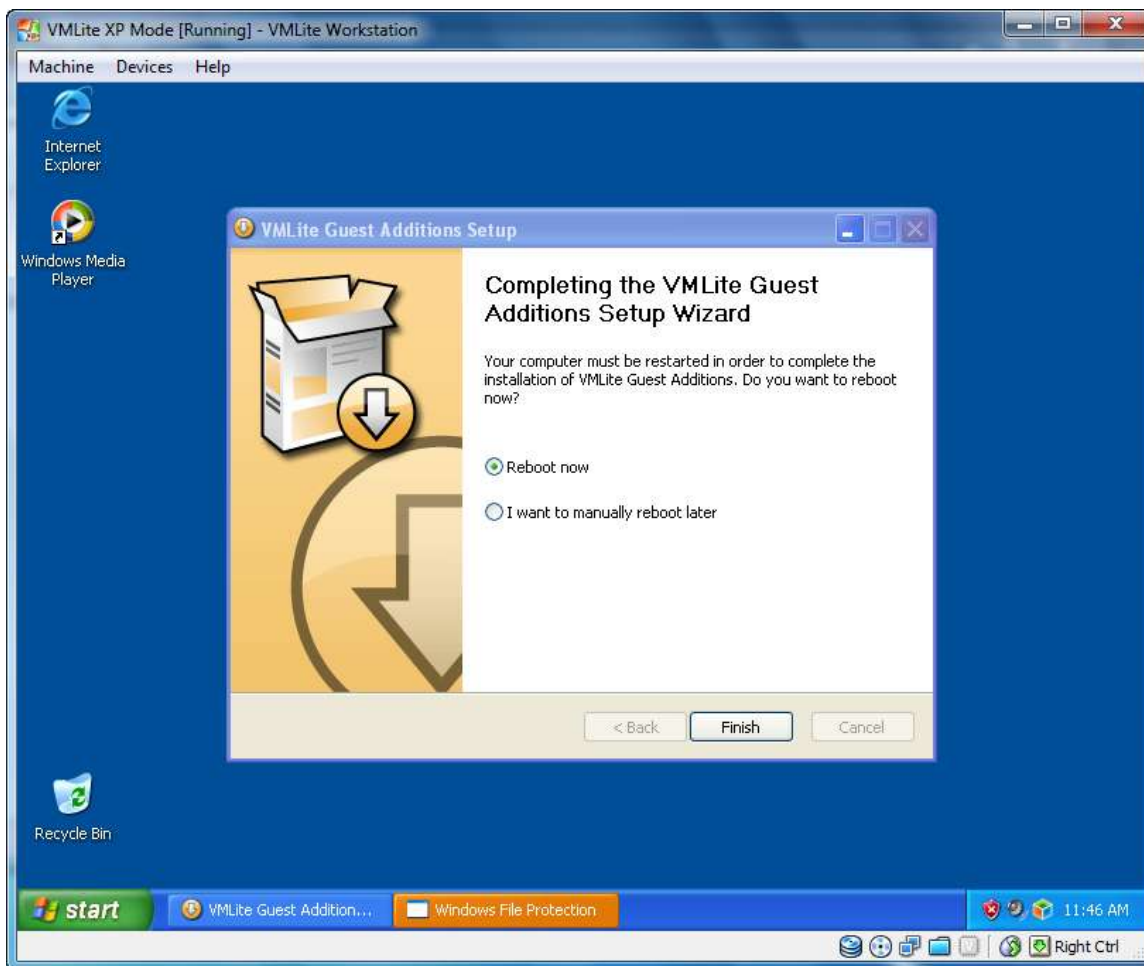


Now we install the Guest Additions: custom drivers that optimize the host-guest communication:

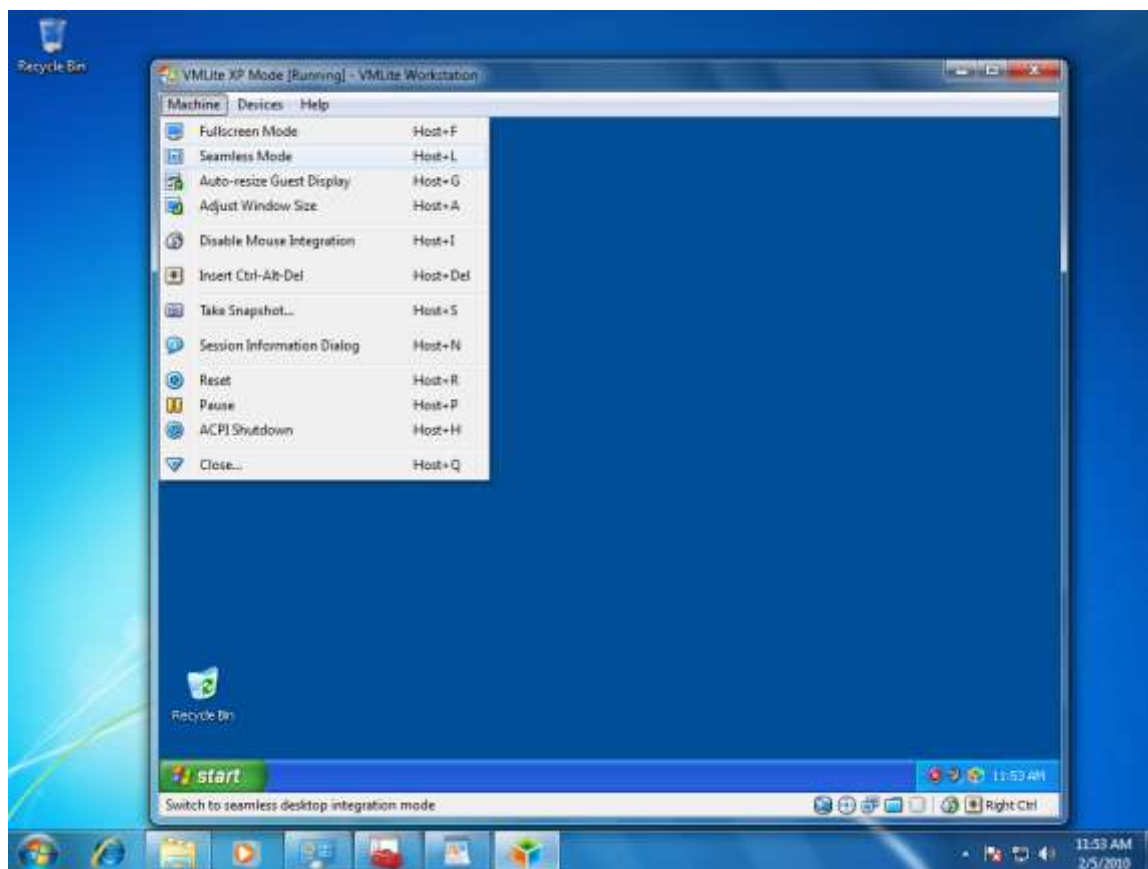






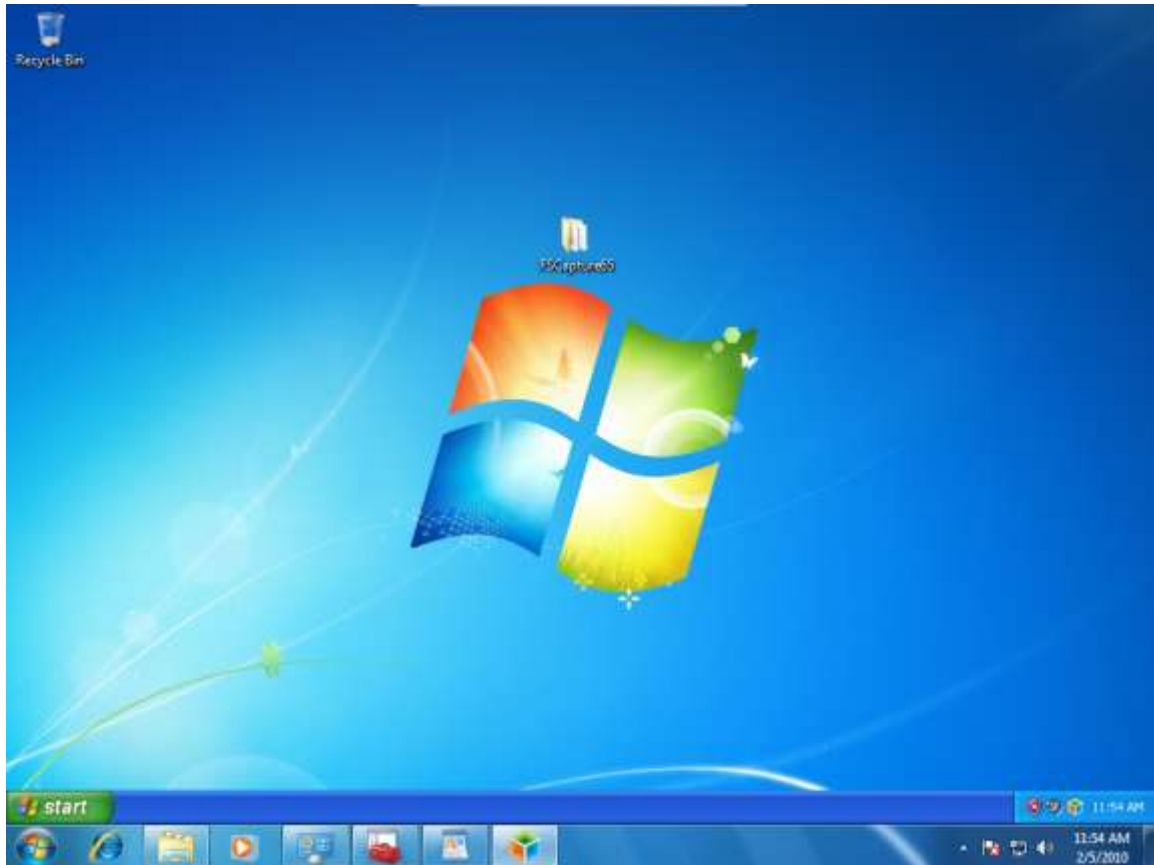


XP Mode is ready. Now we can activate the seamless mode:



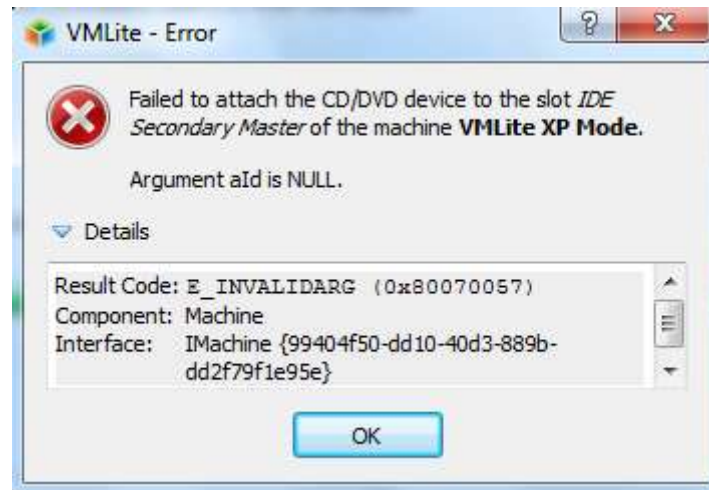
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With seamless mode active, a bottom control window for XP Mode is added. From now on, every application started inside XP Mode will be displayed in the host system like any host window:

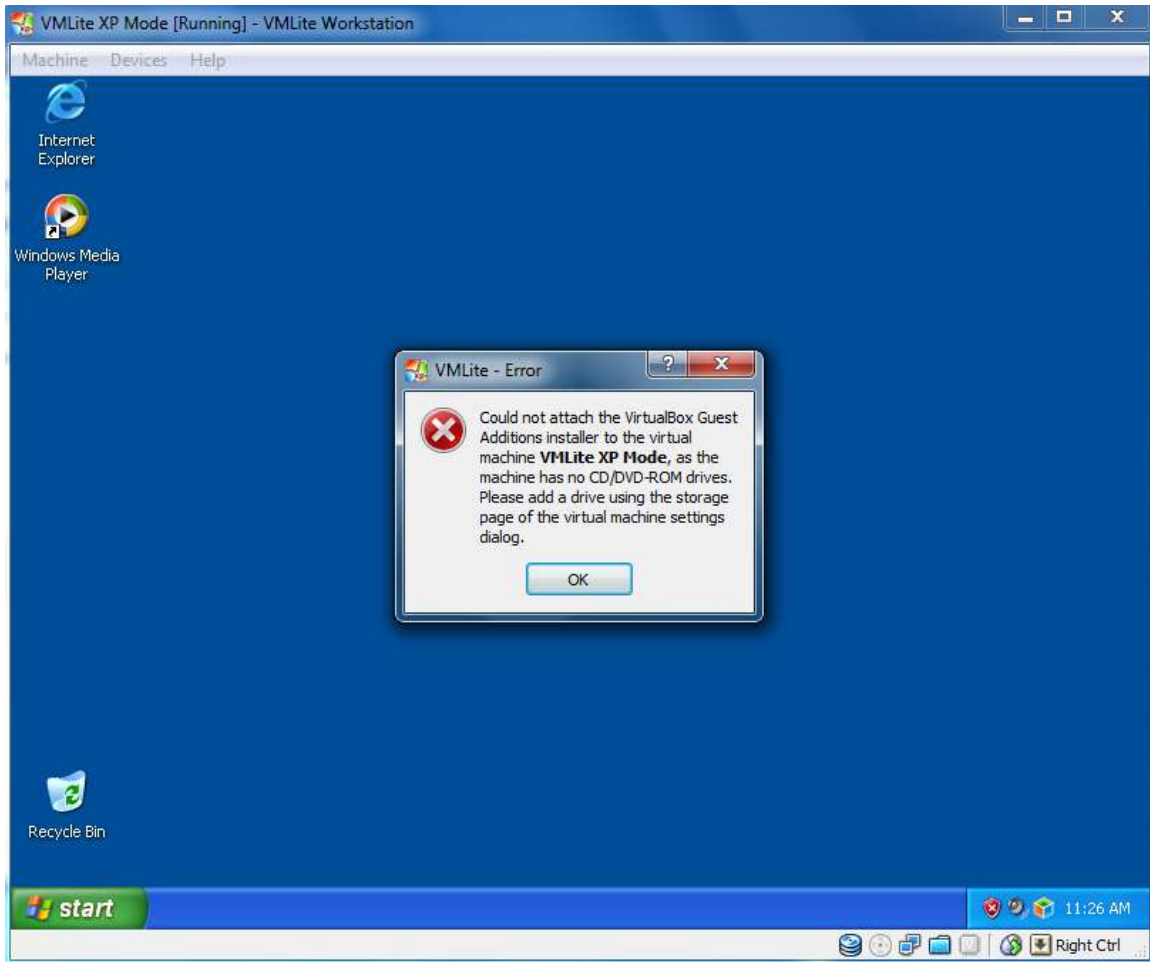


Troubleshooting

This error may be displayed if the virtual CD/DVD device connection fails during VMLite installation phase:

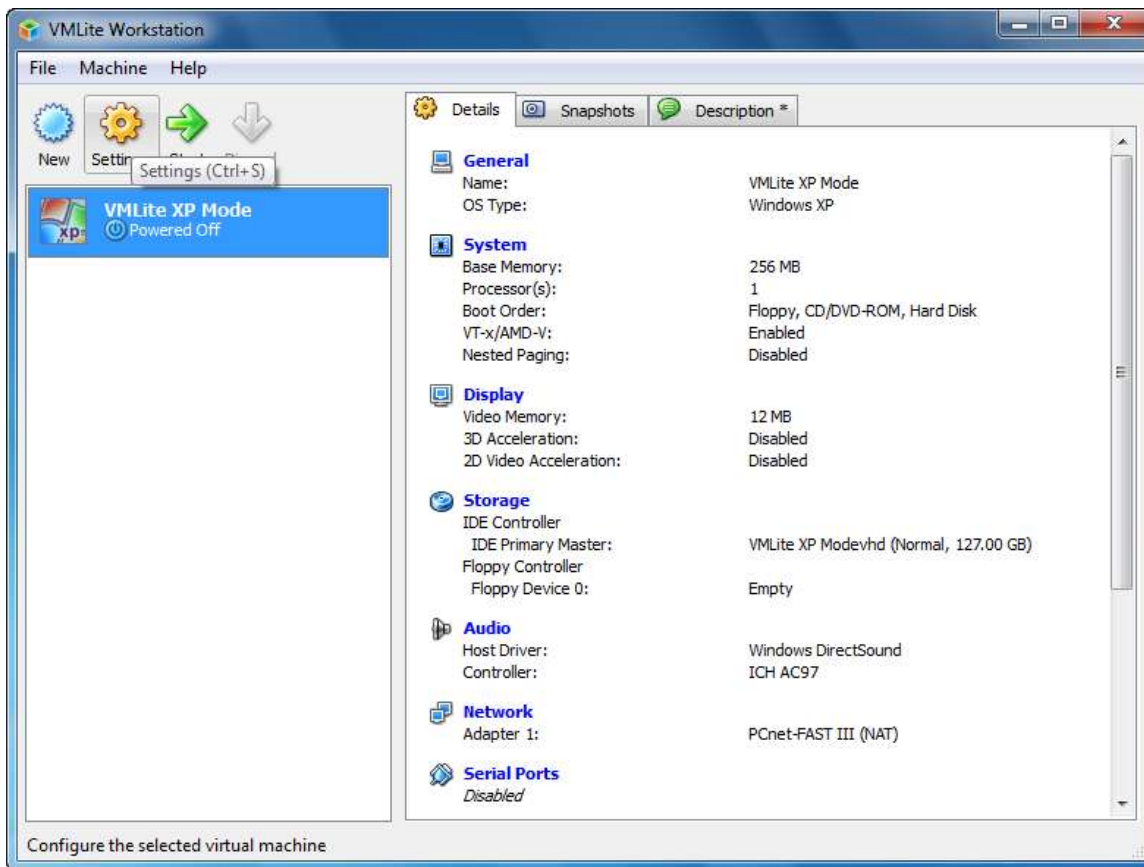


If this error occurs, it is not possible to install the Guest Additions:

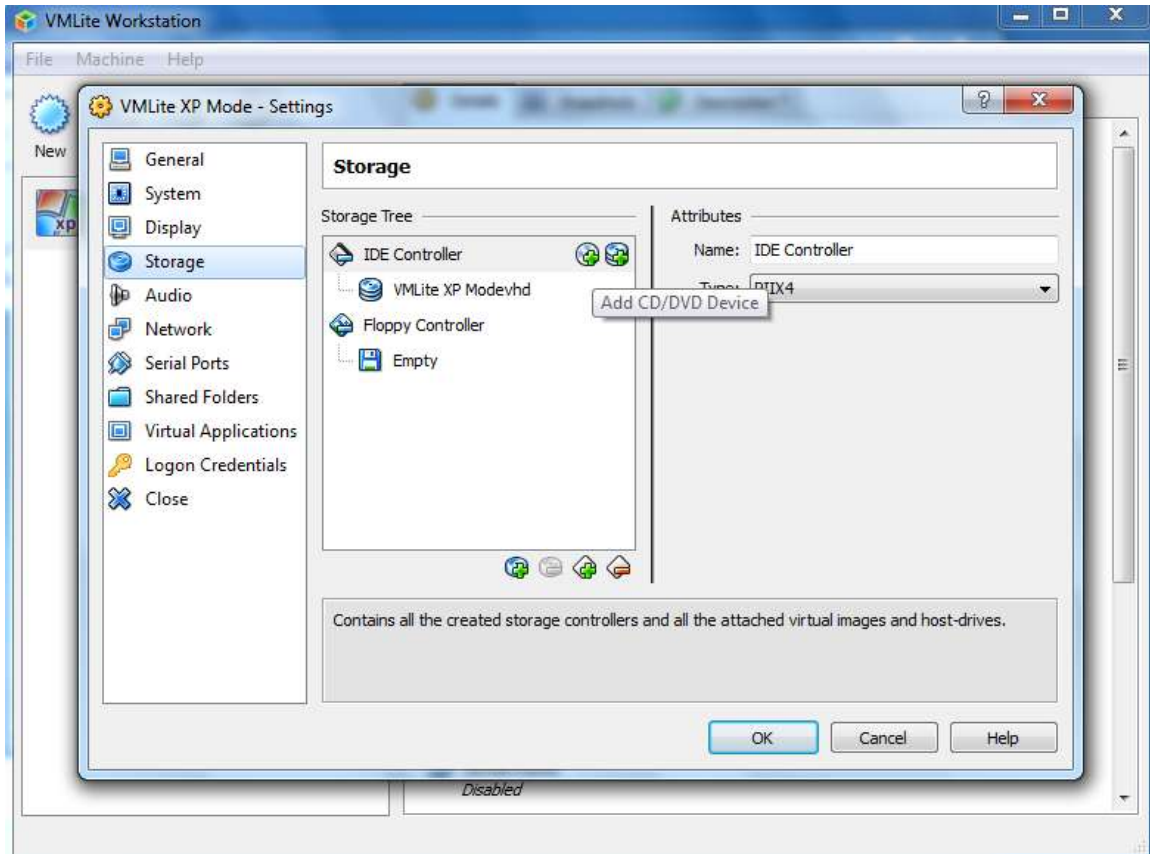


To make the virtual CD/DVD device available in the guest O.S. after the VMLite installation phase, we can do the following:

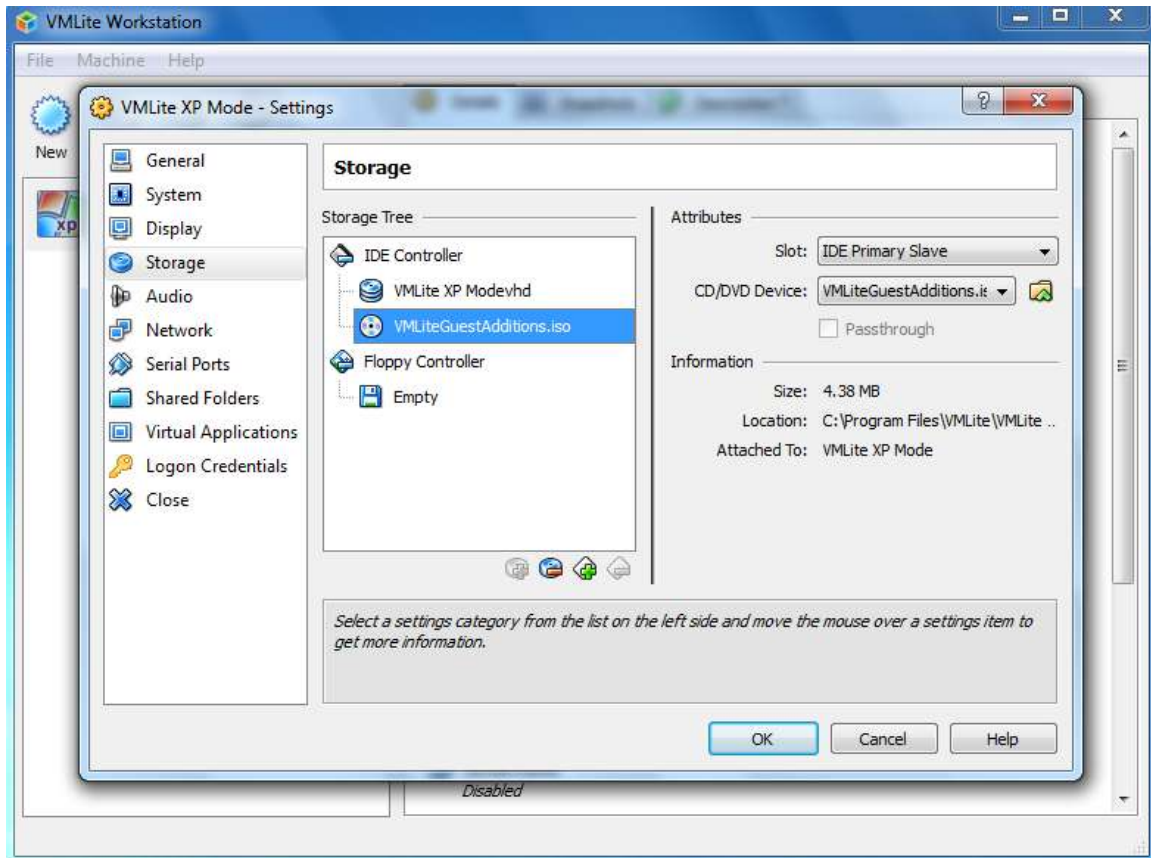
Open VMLite Workstation settings (guest O.S. must be off):



Add a CD/DVD device:



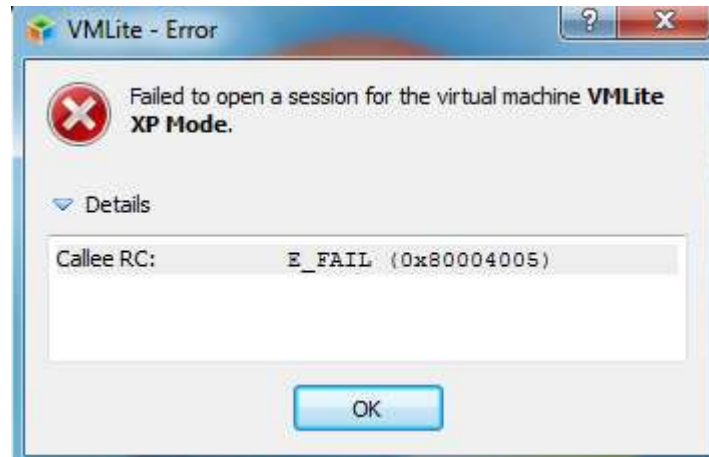
Attach *VMLiteAddition.iso* image to the CD/DVD device:



Start XP Mode and repeat the steps to install guest additions, explained above.

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This error may be displayed if the seamless mode is active, guest additions are not installed, and an application is started in the guest O.S.:



Before starting the application, install guest additions.

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Compatibility with Series10 E69 v7.6

Introduction

The content of this section applies only to Series10 CNCs with E69 v7.6.x that do not have a client PC with Windows XP or earlier operating system. CNCs belonging to this category can communicate with a client PC running Windows7 32-bit or WES7 32-bit, although a software upgrade to E69 v8.0 is required.

So, when is the upgrade to v8.0 required?

When the human interface (i.e. WinNBI) is running on a system that supports Netbeui but does not support shared folders over Netbeui *and* the human interface requirements to exchange files with the CNC.

Operating systems that support both Netbeui and shared folders over Netbeui

- **Windows XP Professional 32-bit** (preferably with Service Pack 3)
- **Windows Embedded Standard**
- **WES 2009**
- **Windows XP Mode** over Windows 7 (not available in Home Edition)
- **Windows 2000** or earlier (WinNBI v4.0 and later versions are not certified on these operating systems)

Operating systems that support Netbeui but do not support shared folders over Netbeui

- **Windows 7 32-bit**
- **WES7 32-bit**

And how does it work?

A release upgrade obviously requires uploading files from a client PC to the CNC. File exchange with a Series10 CNC running E69 v7.6.x in turn requires support for shared folders over Netbeui on the client side. However, once E69 v8.0 is installed on the CNC, shared folders over Netbeui are no longer required. The client OS still needs Netbeui support to communicate with a Series10.

Ok, but how do I upgrade E69 to v8.0?

If your PC supports Netbeui and shared folders over Netbeui you can follow the normal release upgrade procedure using WinNBI Security. Otherwise, follow the instructions in the next chapter.

Upgrade to V8.0 using a WES2009 virtual machine

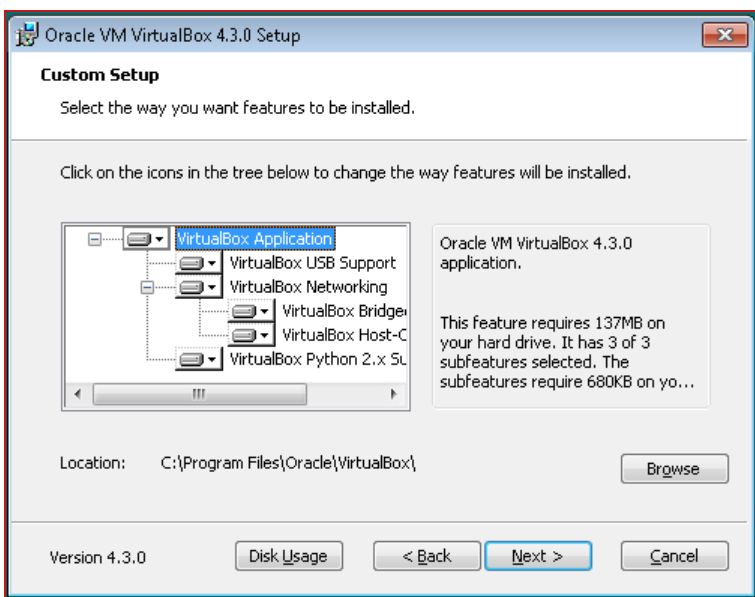
Requirements

- A **PC** with Windows XP or later operating system. If you are reading this chapter, then your PC is most likely running Windows 7 or later OS.
- A **WES2009** virtual machine (provided by PrimaElectro), consisting of two files: WES2009.vdi and WES2009.vbox.

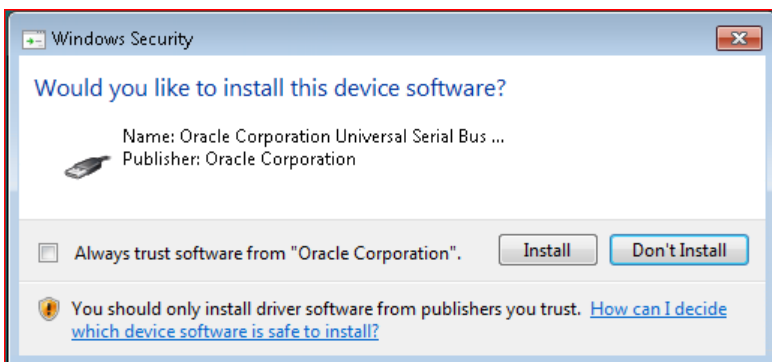
Ok, let's do it!

VirtualBox needs to be installed on the client PC. If VirtualBox is already installed, skip to step 4, otherwise proceed as follows:

1. Download the latest version of VirtualBox for your operating system from [here](#). VirtualBox is distributed under [GPL v2](#) license.
2. Launch the setup executable and follow the instructions. Select all features for installation. Press Next.

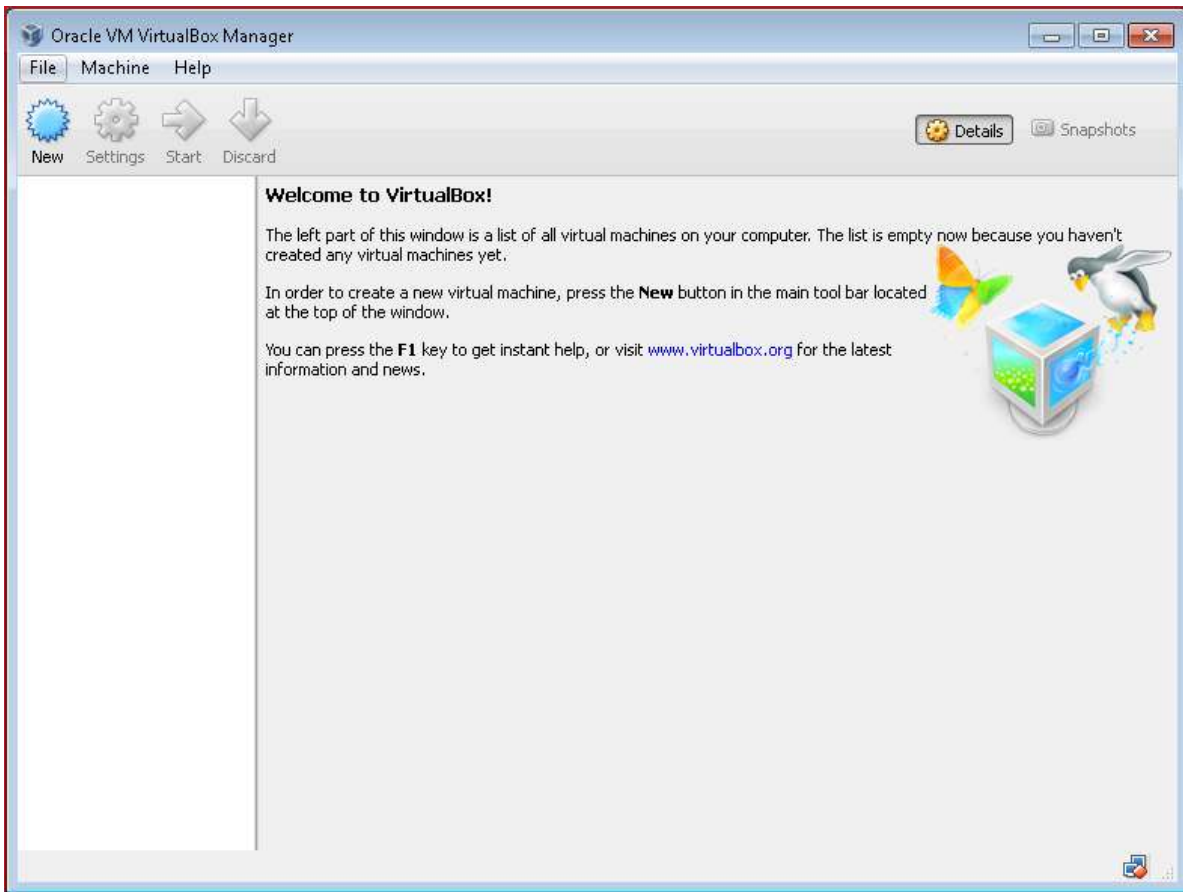


3. VirtualBox needs to install device drivers on your system. Press Install when prompted.



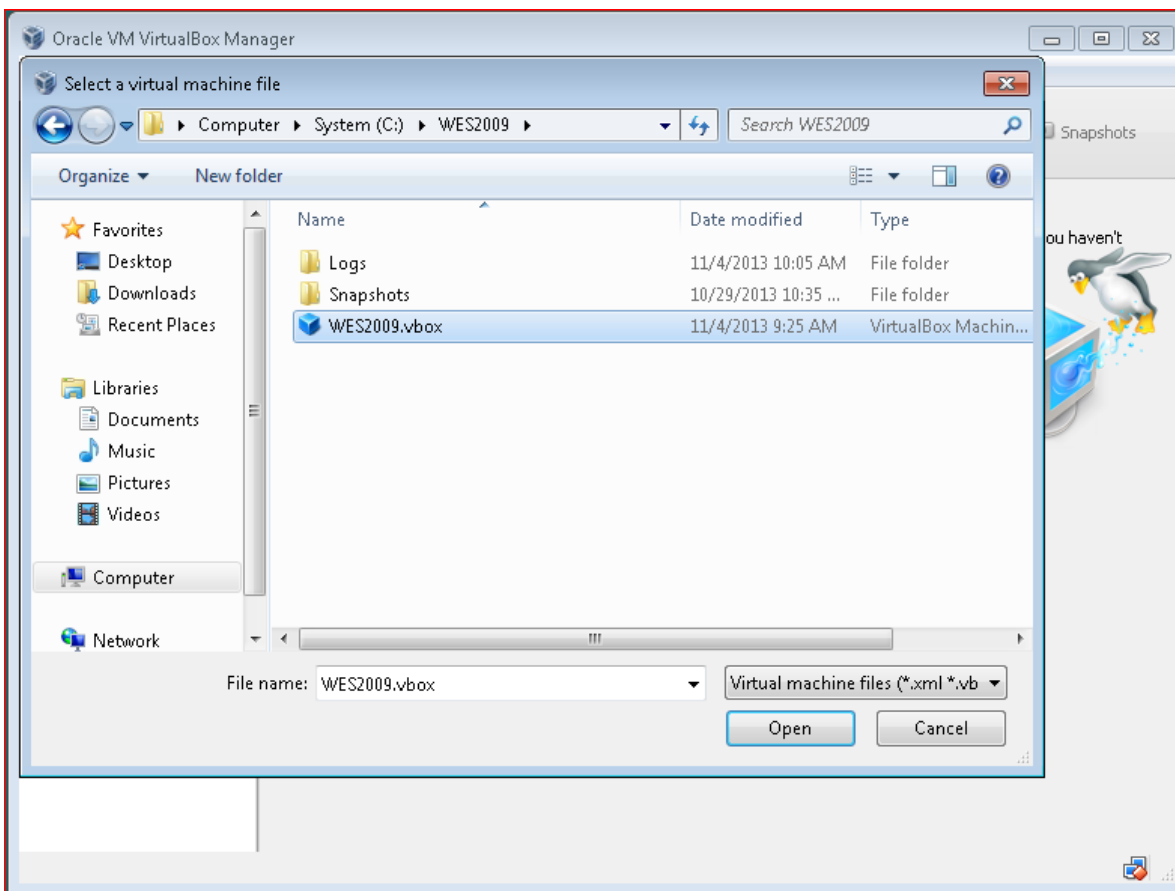
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4. Once installation is complete, launch VirtualBox. The VirtualBox Manager opens.

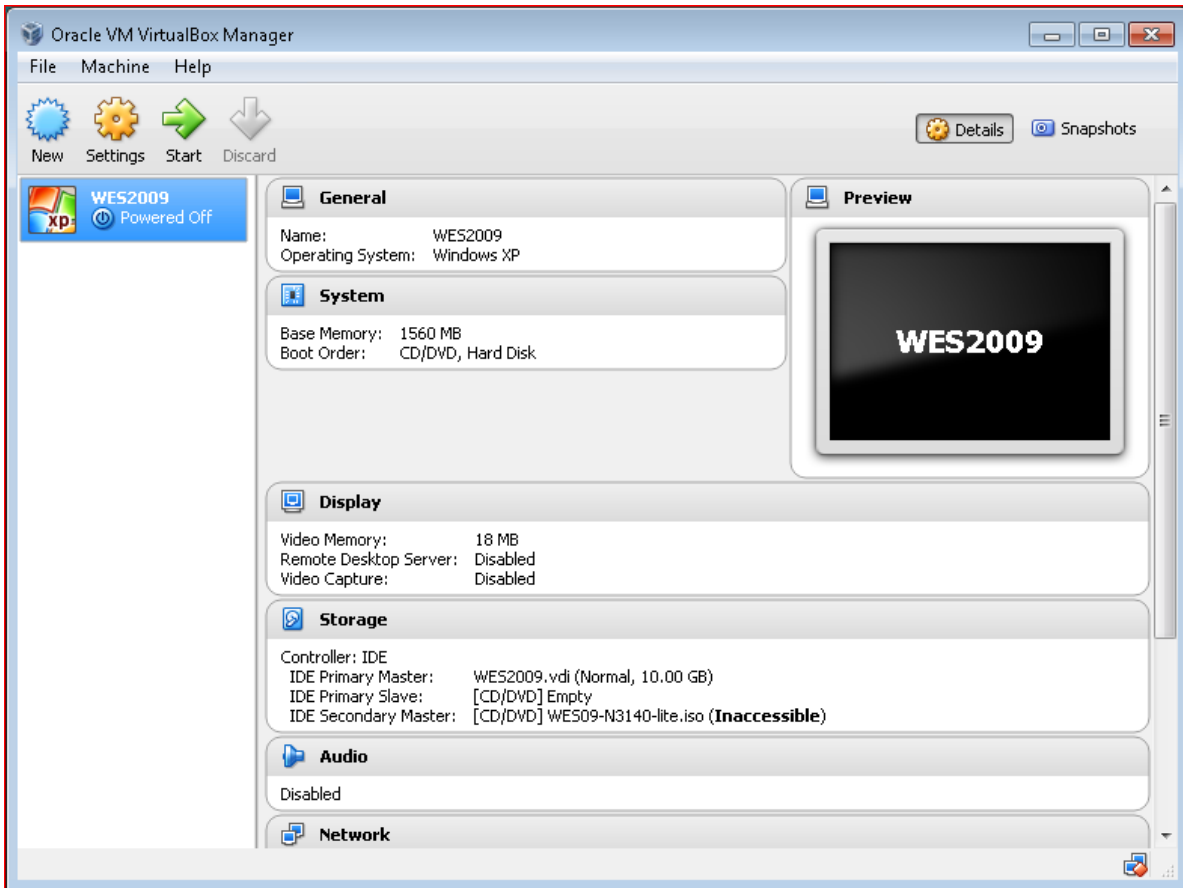


5. Copy WES2009.vdi and WES2009.vbox in a directory of your choice. Ensure that any user that needs to use the WES2009 virtual machine has full access rights over the chosen directory.
6. From the Machine menu in VirtualBox Manager, select Add.

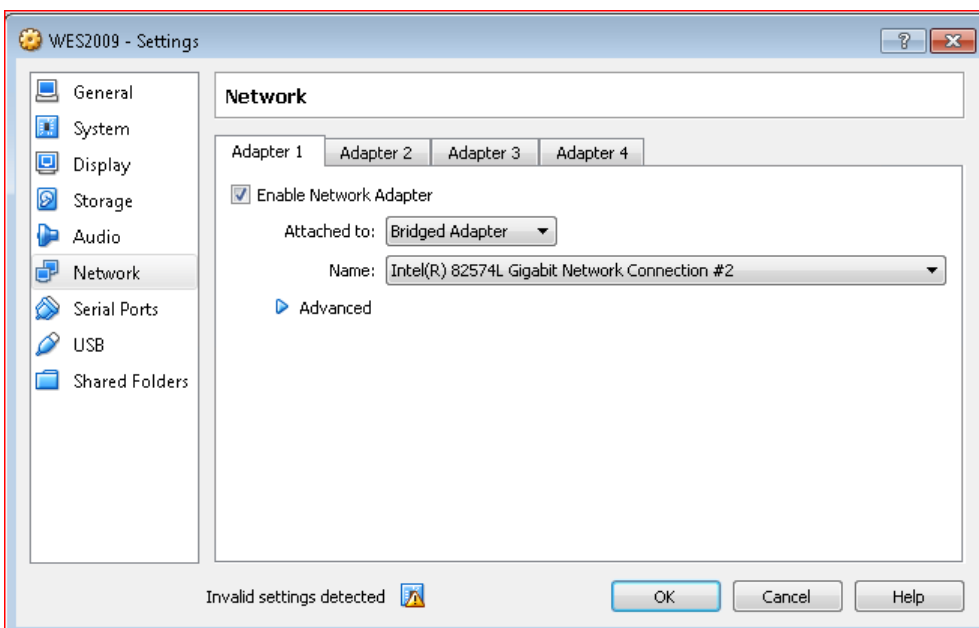
7. Locate the directory containing WES2009.vbox, select it, then press OK. A new virtual machine named WES2009 appears in the VirtualBox Manager.



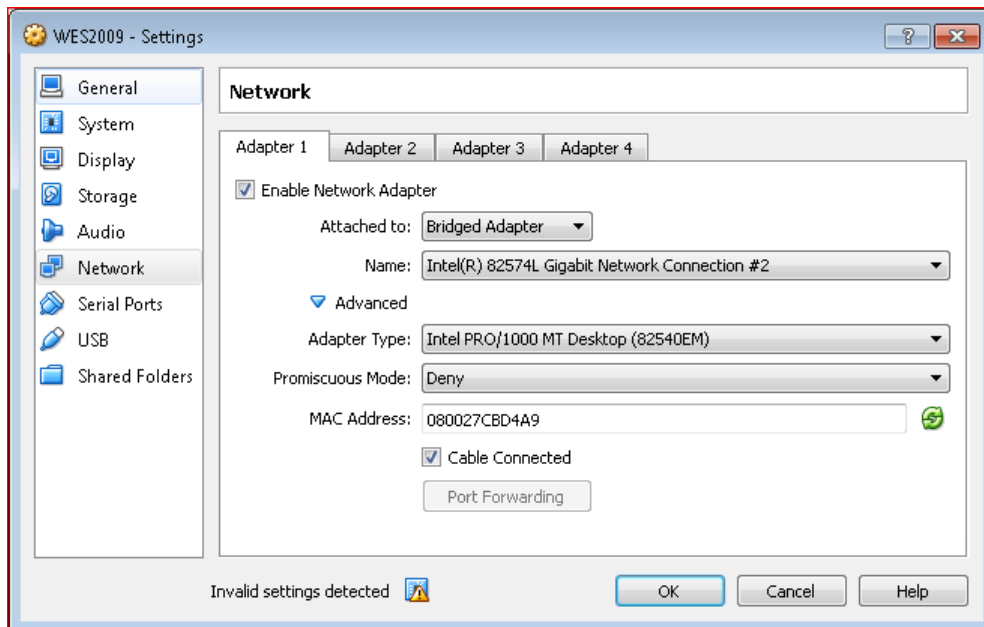
8. Select the new WES2009 virtual machine and press the Settings button.



9. From the list on the left side of the Settings window, select Network.

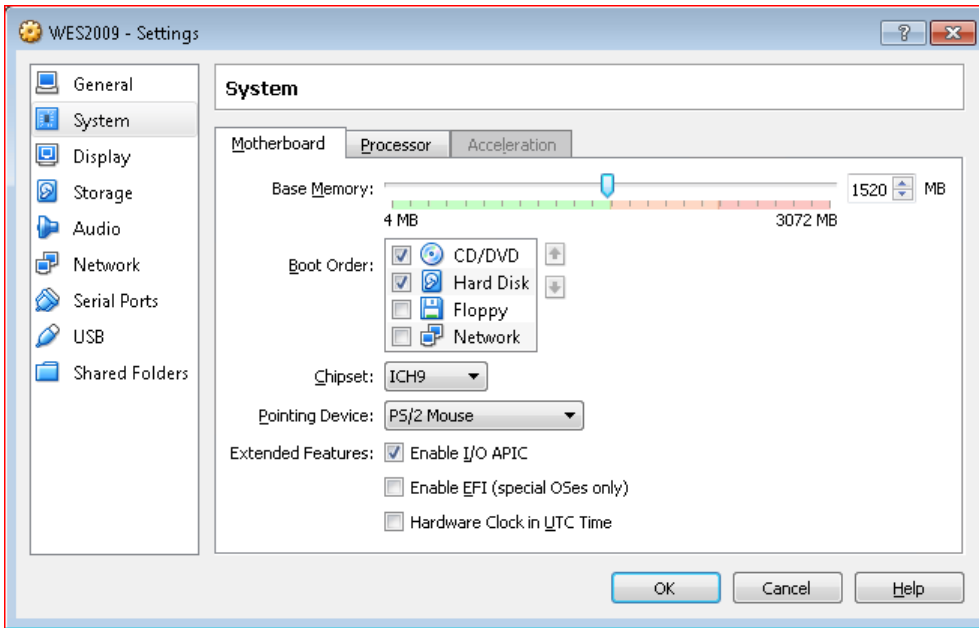


10. Select the Adapter 1 tab.
11. Check the Enable Network Adapter option.
12. Set the other fields as follows:
 - a. Attached to: Bridged Adapter
 - b. Name: select your physical network card (the one that carries the PC-CNC connection) from the dropdown list. Avoid using a WiFi card if possible.
 - c. Open the Advanced section.

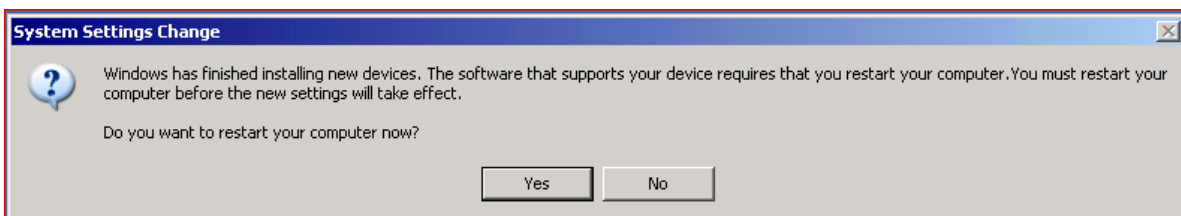


- d. Adapter Type: Intel Pro/1000 MT Desktop (82540OEM)
- e. Promiscuous Mode: Deny
- f. MAC Address: do not edit this field, instead press the refresh button on the right to generate a new MAC address.

13. Select System from the list on the left side of the Settings panel. Select the Motherboard tab. Move the Base Memory slider to the edge of the green area. This slider sets the amount of RAM that VirtualBox reserves for operating the virtual machine. WES2009 requires at least 512MB of RAM to work properly, so try not to go below this value.



14. Check that the settings panel does not display the “Invalid settings detected” warning at the bottom then press OK.
15. With the WES2009 virtual machine selected in VirtualBox Manager, press the Start button (green arrow on the toolbar).
16. If this is the first time the virtual machine is executed on the system (and most likely it is), the guest OS (WES2009) needs to install the virtual drivers for the chipset and the CPU. Reboot the virtual machine when prompted.



17. The WES2009 virtual machine is set up for automatic login. If you need to login again use the following credentials (the password is case sensitive):
 - Username: Administrator
 - Password: PrimaElectronicsSpa
18. Boot Controller is launched automatically at startup. Use Boot Controller to reboot the CNC in Setup mode and follow the normal installation procedure. The setup files for E69 v8.0 and v8.0 Problem Fix 5

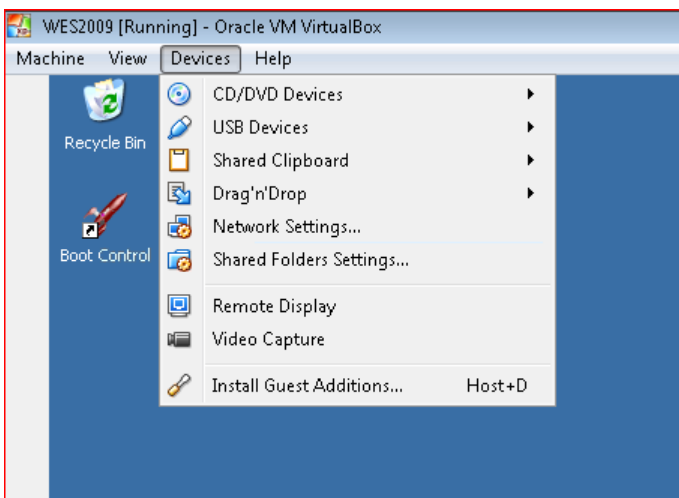
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are located in My Documents\E069 v8.0 Machining Center\
 19. Shutdown WES2009 when done.

VirtualBox Guest Additions (optional)

Guest Additions are a set of utilities that VirtualBox provides for installation on the guest OS, WES2009 in this case. Although not strictly required to operate the virtual machine, they provide a useful set of features, most notably mounting the host OS directories into the guest OS as network drives and automatically resizing the guest OS desktop size in order to match the virtual machine window size.

The WES2009 virtual machine provided by PrimaElectro comes with Guest Additions v4.2.18 already installed. Should you receive a warning that Guest Additions are out of date, you can upgrade to the latest version by just pressing Devices -> Install Guest Additions from the virtual machine window menu.



Series10 Compatibility Table

The following table summarizes the compatibility between Series10 versions and Windows OS versions starting from Windows XP SP3.

10/Series	W7 64bit	W7 32bit	WES7 64bit	WES7 32bit	XP SP3
7.6 Requires	<u>OK XPMODE</u>	<u>OK XPMODE</u>	<u>NO</u>	<u>NO</u>	<u>OK</u>
Netbeui	No Netbeui	No Diskshare	No Netbeui	No Diskshare	
DiskShare	No Diskshare		No Diskshare		
8.0 Requires		<u>OK</u>	<u>NO</u>	<u>OK</u>	<u>OK</u>
Netbeui			No Netbeui		
			No Diskshare		
Notes			<i>XPMODE</i> <i>not available</i>	<i>XPMODE</i> <i>not available</i>	