



PROWESS

SmartDeploy®

# How to Integrate the User State Migration Tool with SmartDeploy Enterprise

---

*Prowess Consulting, LLC*

*Published: September, 2010*

## **Abstract**

*Integrating USMT expands the native functionality of SmartDeploy Enterprise to include the ability to migrate user state information when completing deployments.*

# CONTENTS

<b>INTRODUCING SMARTDEPLOY</b> .....	<b>3</b>
HOW DOES SMARTDEPLOY WORK? .....	3
SMARTDEPLOY AND USMT: SIMPLE INTEGRATION.....	4
<b>HOW TO INTEGRATE SMARTDEPLOY WITH USMT</b> .....	<b>5</b>
BEFORE YOU BEGIN.....	5
CREATING VIRTUAL REFERENCE MACHINE.....	5
ADDING USMT TO VIRTUAL REFERENCE MACHINE .....	10
CREATING BATCH FILE TO RUN SCANSTATE .....	10
CREATE SMARTPE BOOT MEDIA.....	11
BOOT YOUR TARGET COMPUTER TO SMARTPE, RUN SCANSTATE AND DEPLOY IMAGE .....	22
RUNNING LOADSTATE TO COMPLETE THE MIGRATION .....	34
<b>SUMMARY</b> .....	<b>36</b>
<b>MORE INFORMATION</b> .....	<b>36</b>

# INTRODUCING SMARTDEPLOY

---

Deploying an operating system can frequently become a time-consuming and frustrating task, leading many companies to look for ways to streamline and simplify their operating system deployment strategies.

Operating system deployment usually involves a disk imaging technology that lets you make a copy of a master hard disk drive and transfer this copy to your computers. This works well as long as the target hardware is the same as the master computer. However, in reality, a company's computers are often a mix of different makes and models. This means that the IT staff must create a separate master image for each hardware platform on the network, a time-consuming and labor-intensive endeavor.

SmartDeploy® Enterprise from Prowess provides a real-world solution for this challenge by eliminating the need to create multiple master images for different computers. SmartDeploy helps make deployment of almost all versions of the Windows® operating system—including Windows® 7—faster and easier.

## How Does SmartDeploy Work?

SmartDeploy Enterprise uses virtual machines (VMs) to create and maintain the operating system and applications that you want to deploy. The process of creating the master image for the hardware platform is similar to that used with other disk imaging software; however with SmartDeploy, you need to create only one master image no matter how many different computer brands or models you have on your network. A separate file called the platform pack contains the device drivers and other hardware-specific files, customizing the standard master image for each computer's unique properties. Platform Packs are available for many of the top computer manufacturers and models. You can also create custom platform packs with the Platform Manager. SmartDeploy merges these platform packs to the master image when deploying the operating system image.

SmartDeploy Enterprise provides advantages over traditional disk imaging methods. Separating hardware and device drivers from the operating system and software means you have fewer images to maintain. Updates to any of the environments within the master image are transmitted as a small delta (or differencing) image file, which makes it possible for you to release updates frequently and easily at a low cost. You do not need a dedicated computer or a dedicated infrastructure to run image management tasks. Additionally, SmartDeploy Enterprise does not require a network to manage or deploy images; you can update remote users or offices without a network connection.

## SmartDeploy and USMT: Simple Integration

Microsoft's User State Migration Tool (USMT) is a set of components that are used to migrate user files and settings during deployments of Windows operating systems. USMT offers multiple scenarios for capturing user files and settings. The user state can be copied to a network resource from the source machine then copied to the target machine. When upgrading a machine USMT offers a Hard-Link Migration feature which allows the user state to be moved to a specific location then linked in the new installation. When integrated with SmartDeploy Enterprise, USMT offers the ability to refresh or upgrade computers with little hassle for the IT technician.

In this example we are showing a computer upgrade scenario using Hard-Link migration, where a user's Windows XP environment is migrated to a freshly installed Windows 7 environment on the same machine. These steps can be modified to fit a computer replacement scenario as well.

# HOW TO INTEGRATE SMARTDEPLOY WITH USMT

---

The following sections step you through the process of integrating USMT with SmartDeploy. You are first guided through the process of creating a single partition install of Windows 7, then adding the USMT components to the install. This virtual machine will then be captured into a WIM image and deployed using a custom SmartDeploy Preinstallation Environment (SmartPE) boot image, which will include USMT. Next you will be shown how to create a deployment task that will utilize USMT to complete a user migration.

## Before You Begin

To integrate USMT with SmartDeploy Enterprise, you must have SmartDeploy installed on your technician computer. Confirm that your environment meets the [hardware requirements](#) and that you have a [supported host operating system](#), [supported guest operating systems](#), and [supported virtual environment](#). You can download SmartDeploy Enterprise from the [Prowess Web site](#). License SmartDeploy Enterprise by using the Licensing Wizard; see [Product Licensing and Activation](#) for more information. You must also have Windows AIK for Windows 7 installed on your system. Windows AIK can be downloaded from the [Microsoft Web site](#).

## Creating Virtual Reference Machine

In order to successfully complete a Hard-Link Migration you will need to create your Windows 7 image on one partition. When Windows 7 is installed to a single partition you will be able to complete a Wipe and Load deployment using Smart Deploy Enterprise to protect files from the original Windows XP install.

1. Create a **New Virtual Machine**, this will vary based on the virtualization software being used. Please refer to the User Guide of your software for further details.
2. Boot the new virtual machine using Windows 7 install media. This can be accomplished by mounting an iso image file of the install media or connecting to the host physical CD ROM. For further details please consult the User Guide for your virtualization software.

3. Once booted, the **Install Windows** page will appear. Press **Shift + F10** to open a **Command Prompt**.



Figure 1 Windows 7 Localization

4. From the **Command Prompt** enter the following commands followed by pressing the **Enter** key.
  - a. **Diskpart**
  - b. **Select Disk 0**
  - c. **Clean (note this will destroy any data on the VM)**
  - d. **Create Partition Primary**
  - e. **Exit**

**Close the Command Prompt.**

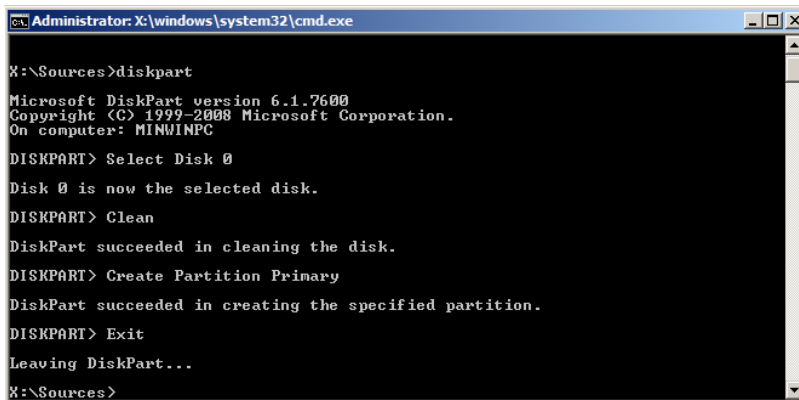


Figure 2 Diskpart Commands

5. From the **Localization** page accept the defaults and click **Next**.



Figure 3 Language Select

6. Click **Install Now**.



Figure 4 Install Windows

- You will receive a message stating **Setup is Starting**. When the **EULA** is displayed select **I accept the license terms** and click **Next**

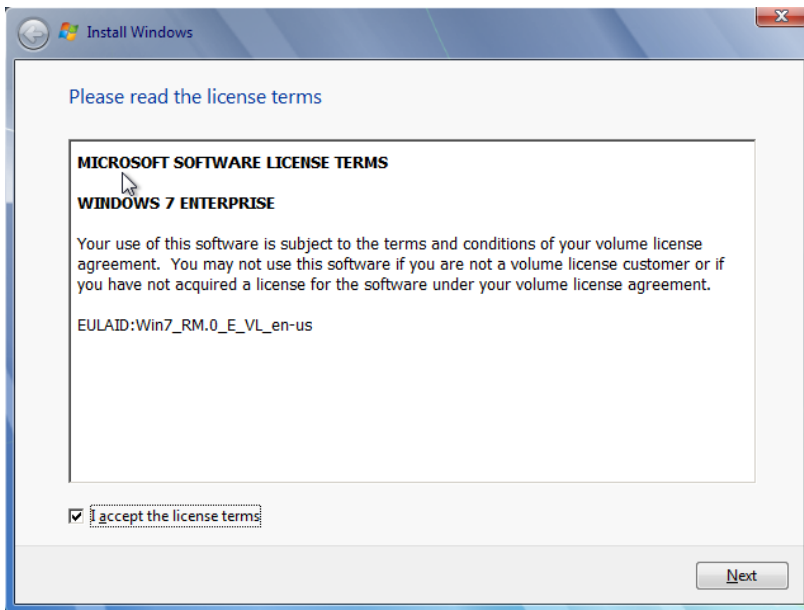


Figure 5 License Terms

- On the **Which type of installation do you want** page select **Custom**.

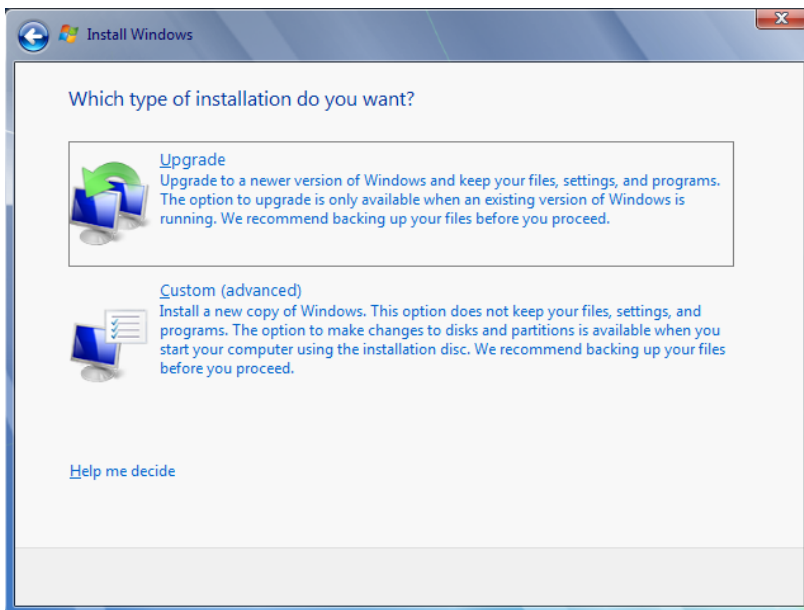


Figure 6 Installation Type

- On the **Where do you want to install Windows** page leave the **Default** disk selected and click **Next**.

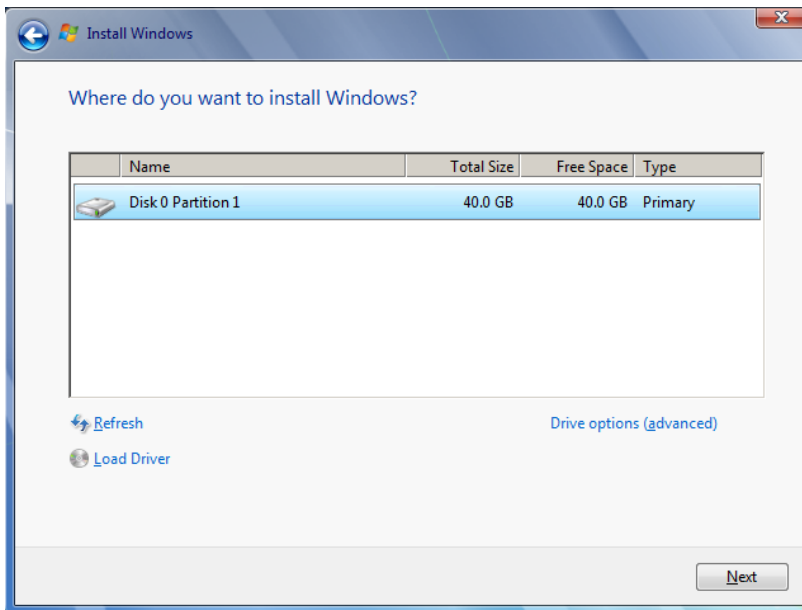


Figure 7 Select Disk

- Wait for the install process to finish, this will take a while. When finished you will be prompted to enter further information about the installation. Complete all fields, login to the computer and continue to the next section.

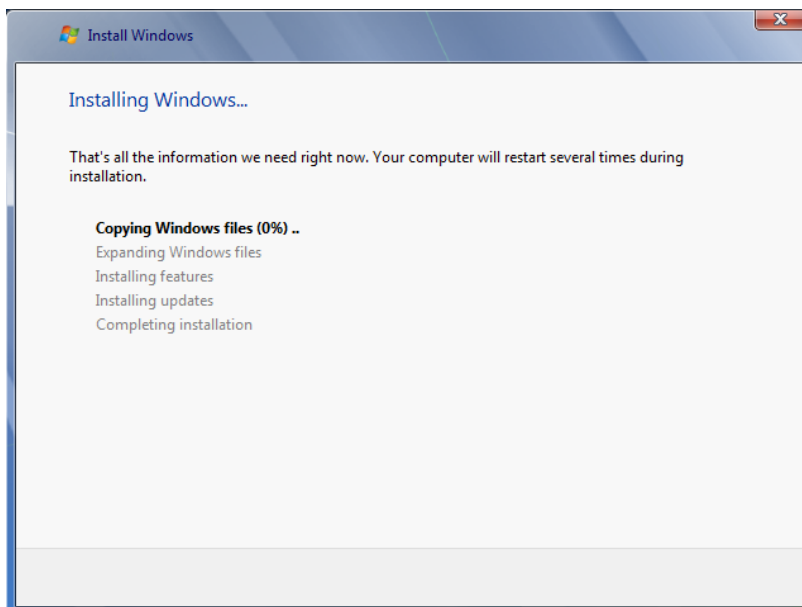


Figure 8 Installing Windows

## Adding USMT to Virtual Reference Machine

Next, you will need to add the USMT components to your reference computer so that it is accessible after the deployment of your image.

1. Download and install [Windows AIK](#).
2. If your virtual reference machine is not already started, please start it now.
3. From your technician computer navigate to c:\Program Files\Windows AIK\Tools\USMT\x86 and copy the contents of this folder to c:\USMT on your virtual reference machine.
4. Shutdown your virtual reference machine
5. You can now use the Capture Wizard to capture the master image as described in the [SmartDeploy Enterprise User's Guide](#).

## Creating Batch File to Run ScanState

In this section we will create a batch file that will be run as a task from the Deploy Wizard. The batch file will create an environment variable for use with USMT, as well as start the process of copying users data and settings.

1. Open **Notepad.exe** by clicking **Start>All Programs>Accessories>Notepad**.

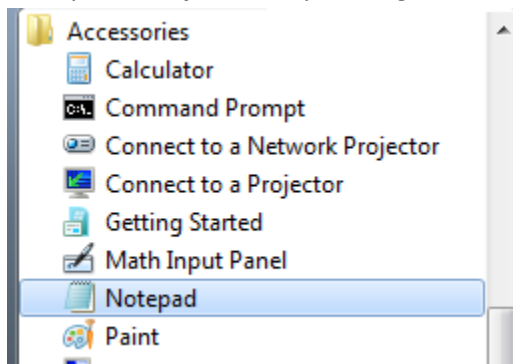
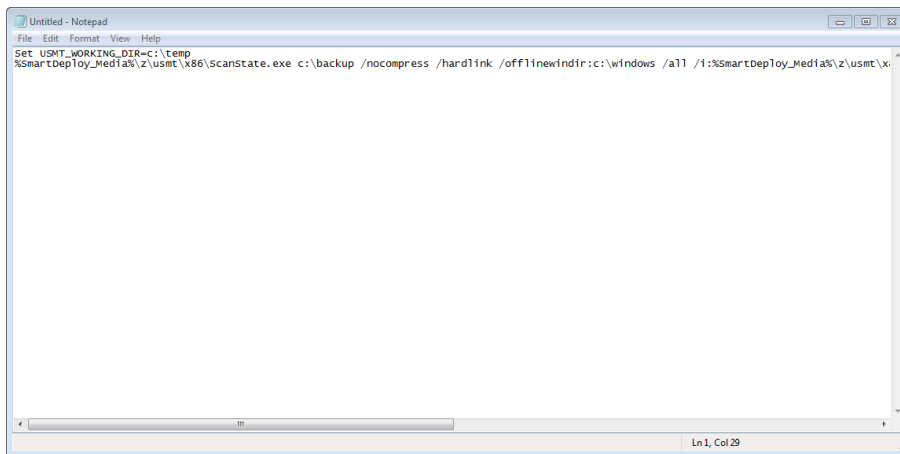


Figure 9 Open Notepad from the Start Menu

2. From Notepad enter the following information one line at a time.
  - a. Set USMT\_WORKING\_DIR=c:\temp
  - b. %SmartDeploy\_Media%\z\usmt\x86\ScanState.exe C:\backup /nocompress /HardLink /offlinewindir:c:\windows /all /i:%SmartDeploy\_Media%\z\usmt\x86\migdocs.xml /i:%SmartDeploy\_Media%\z\usmt\x86\migapp.xml /i:%SmartDeploy\_Media%\z\usmt\x86\miguser.xml /!x:\windows\temp\ScanState.log

Note that C:\Backup is where the user state will be saved and loaded from once the deployment is complete. It is a local folder on the target machine that will be protected during deployment, using SmartDeploy. For more information on the commands in this section please check the [USMT User's Guide](#).



```

Set USMT_WORKING_DIR=c:\temp
%SmartDeploy_Media%\z\usmt\x86\ScanState.exe c:\backup /nocompress /hardlink /offlinewindir:c:\windows /all /i:%SmartDeploy_Media%\z\usmt\x
  
```

Figure 10 USMT Batch file

3. When finished click **File>Save As**. Navigate to C:\Program Files\Windows AIK\Tools\USMT. Enter **USMT.BAT** for the file name, change **Save as type** to **All files**, click **Save**.

## Create SmartPE Boot Media

To integrate USMT with SmartPE, begin by using the Media Wizard to create a SmartPE ISO, a customized environment that captures or deploys images to target computers.

1. Start the Media Wizard by clicking **Start > All Programs > Prowess > SmartDeploy Enterprise > Media Wizard**.

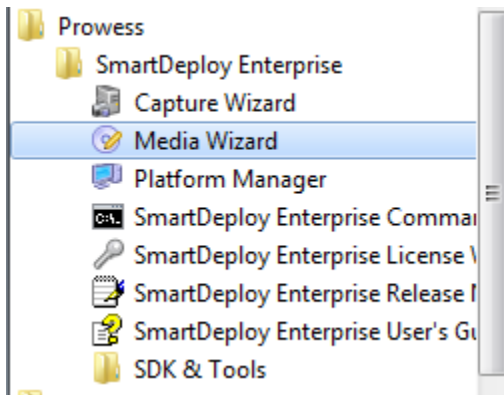


Figure 11 Open Media Wizard from Start Menu

2. On the **Welcome to the Media Wizard** page, click **Next**.

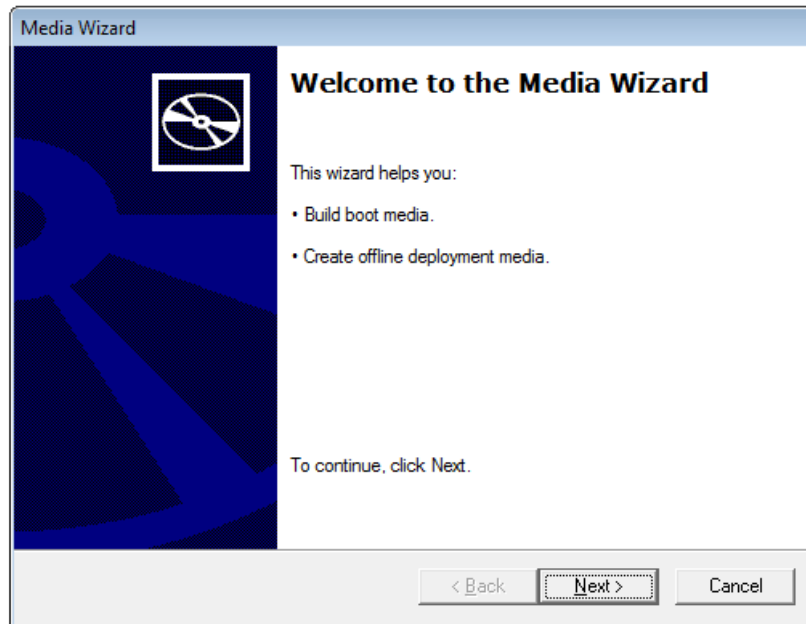


Figure 12 Welcome to the Media Wizard

- On the **Select Task** page, select **Build boot media**, and then click **Next**. This option is used to build boot media for booting the target computers to the SmartPE.

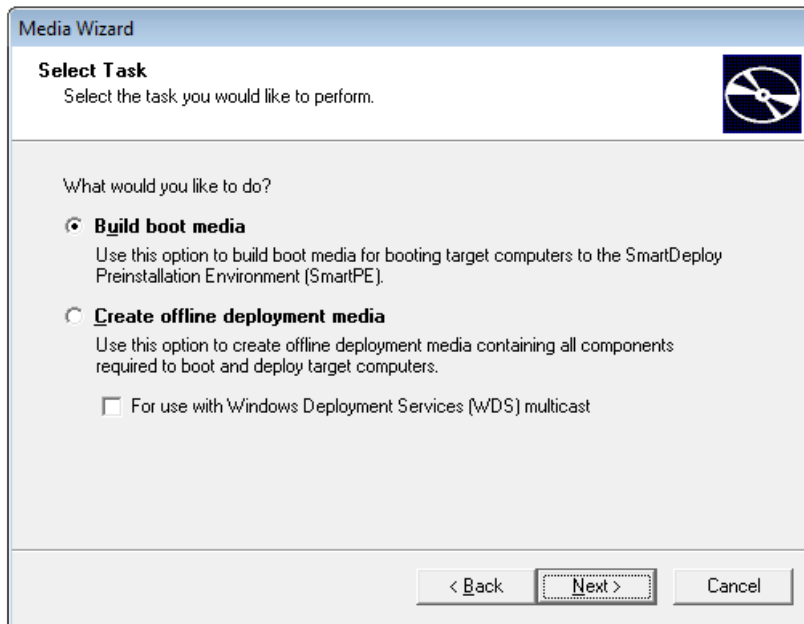


Figure 13 Select Task

- On the **Platform Pack** page, click **Browse**. You can then select a Platform Pack that contains support for booting and deploying the target computers.

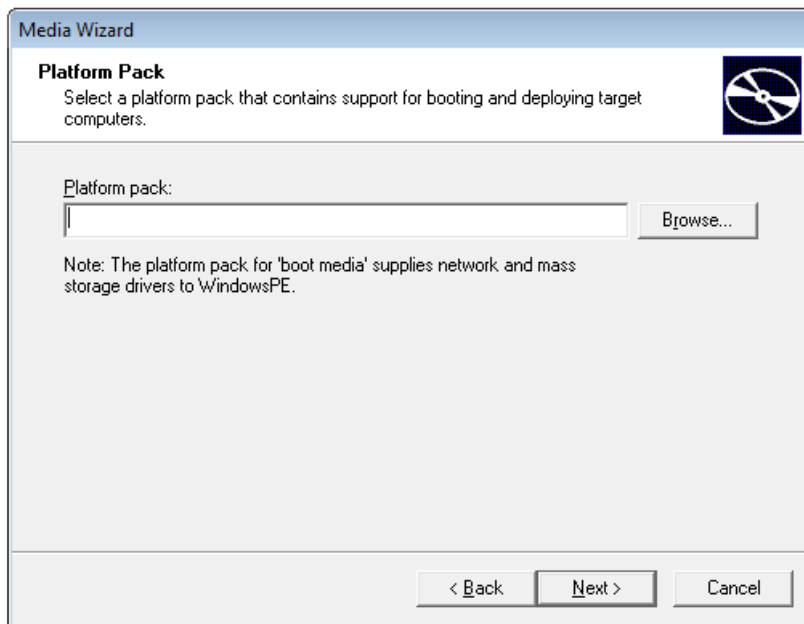


Figure 14 Browse to select a Platform Pack

5. Select the Platform Pack file that contains the drivers for the target computers by clicking on the file name. In this example, we use a **Default** Platform Pack.

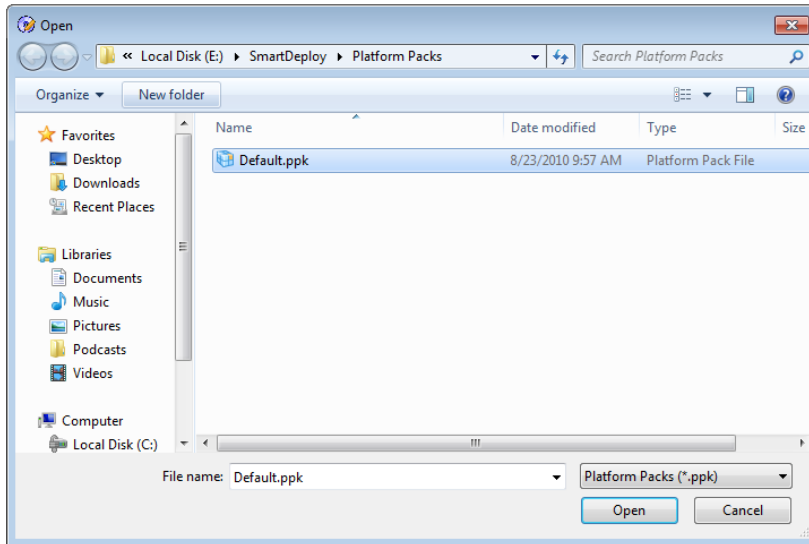


Figure 15 Navigate to Default.ppk

6. Return to the **Platform Pack** page of the Media Wizard. Click **Next**.

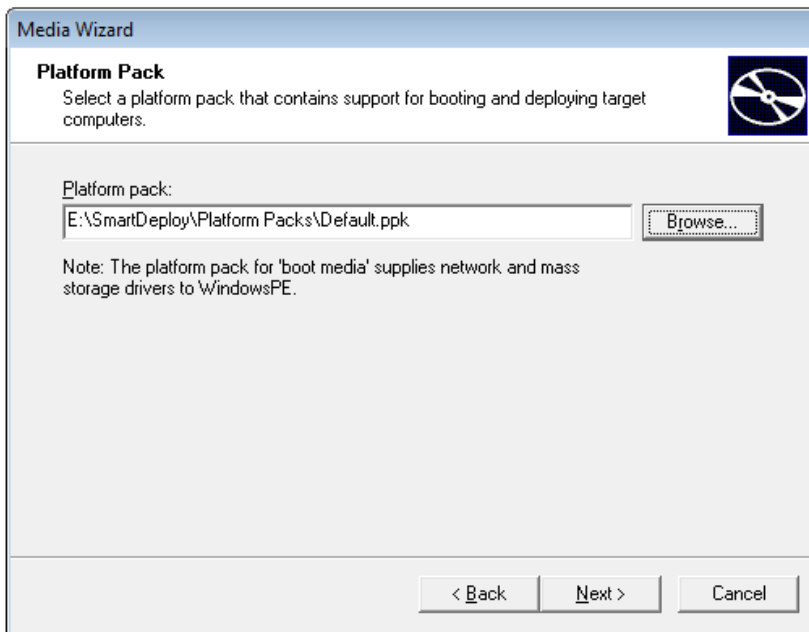


Figure 16 Select Platform Pack

- On the **Optional Components** page, you can select the additional components you would like to include. For example, you can enable or disable the SmartDeploy Virtual Network Computing (VNC) Server and or the SmartDeploy Cloud Services, designate a custom answer file and add optional files.

To completely integrate USMT we will need to add the components to SmartPE, to do so click **Browse** next to **Optional Files**.

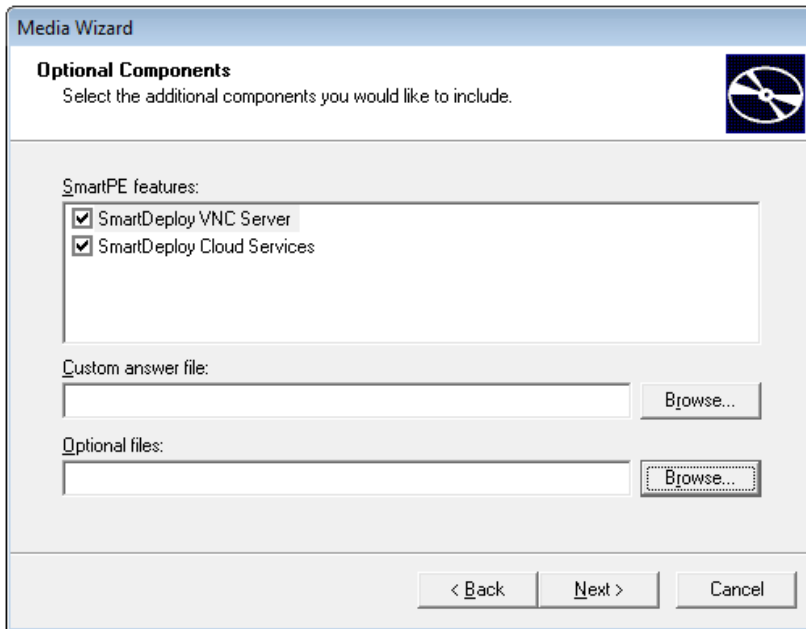


Figure 17 Browse to select Optional Components

8. Browse to **C:\Program Files\Windows AIK\Tools\USMT** and click **OK**.

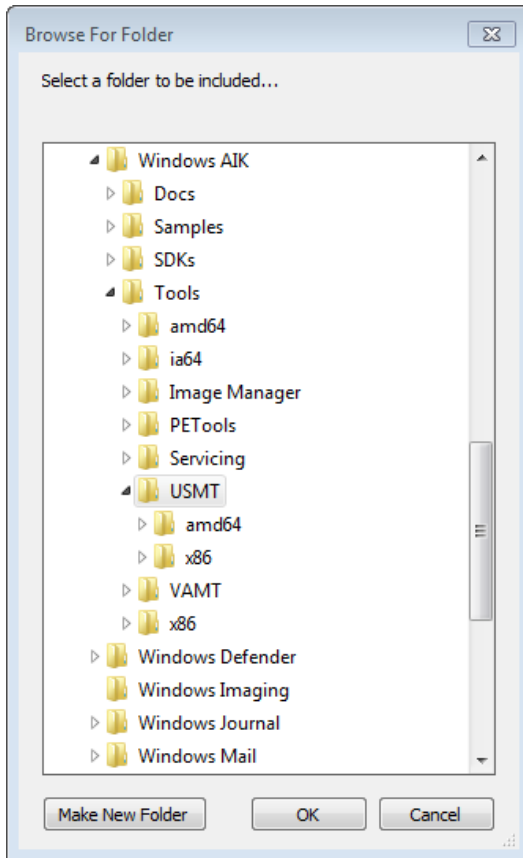


Figure 18 Select USMT folder

9. Back at the Optional Components page, verify the optional files path is correct and select **Next** to continue.
10. SmartDeploy Cloud Services provides functionality to remotely connect to a SmartPE instance and complete an installation.

If you are going to use SmartDeploy Cloud Services, type the SmartDeploy Cloud Services account ID into the **Account** box on the **SmartDeploy Cloud Services** page, and then click **Next**. If you do not have an account, simply click **Next**.

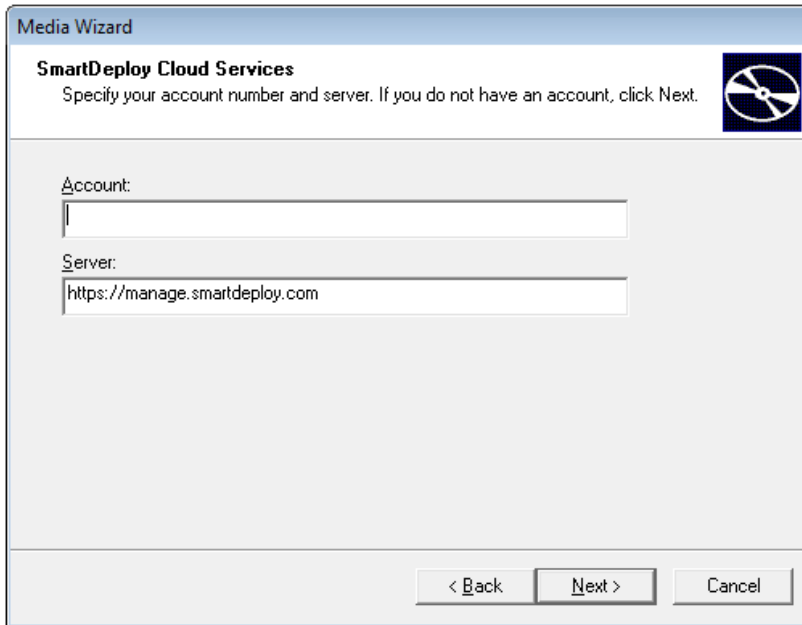


Figure 19 SmartDeploy Cloud Services

11. SmartDeploy VNC Server uses virtual network computing to remotely connect to and administer the target computer during the deployment process. You must install a VNC client on your computer and then configure the client to connect to the SmartDeploy VNC Server using the target computer’s IP address.

If you are going to use the SmartDeploy VNC Server, provide VNC authentication by typing and confirming the password required to connect remote computers running SmartPE on the **SmartDeploy VNC Server** page, and then click **Next**.

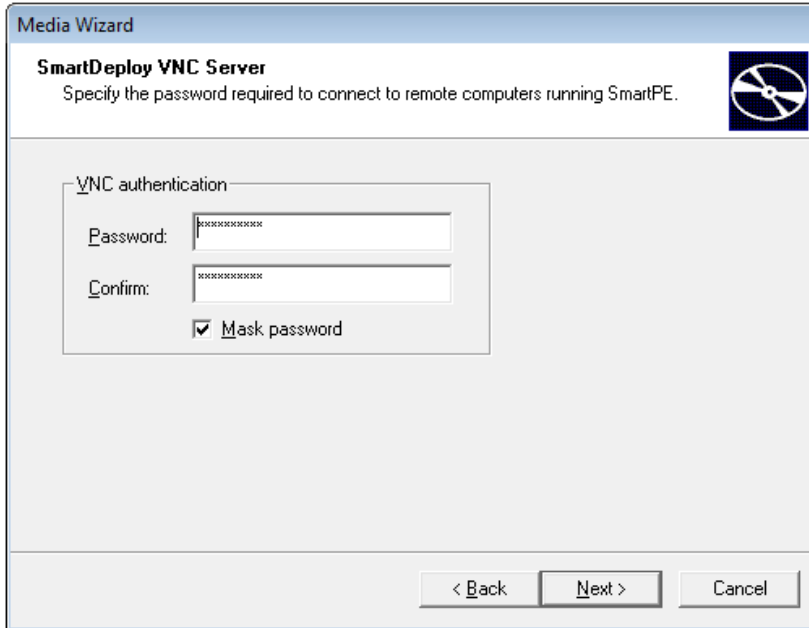


Figure 20 SmartDeploy VNC Server page

- On the **Media Type** page, select the media type for the ISO image file. For this example, make sure that **CD / DVD disc** and **CD 74min 650MB** are selected to create a bootable disc, and then click **Next**.

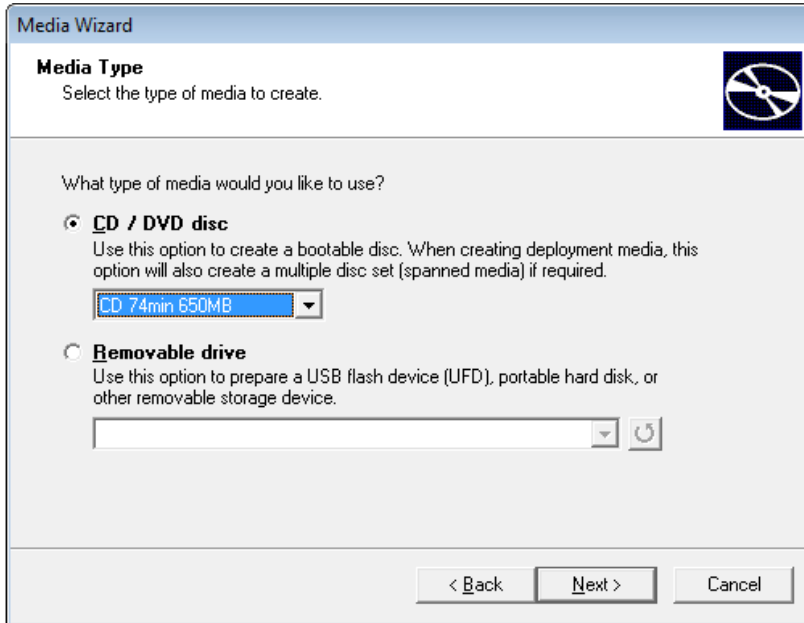


Figure 21 Select Media Type

- On the **Save Options** page, type the path and name of the ISO image file. For this example, type: **E:\SDE\SmartPE.iso** and select **Next**.

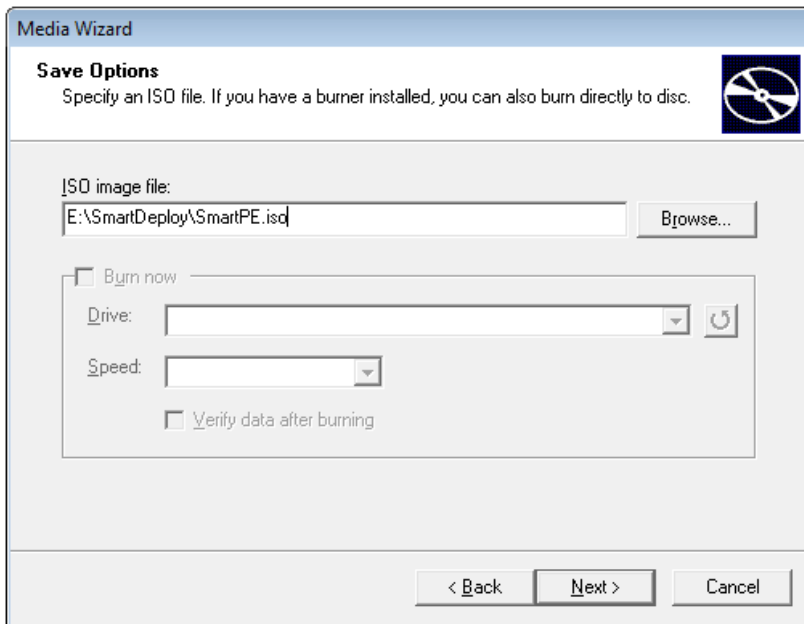


Figure 22 Save Options

14. To create the media and close the wizard, click **Finish**.

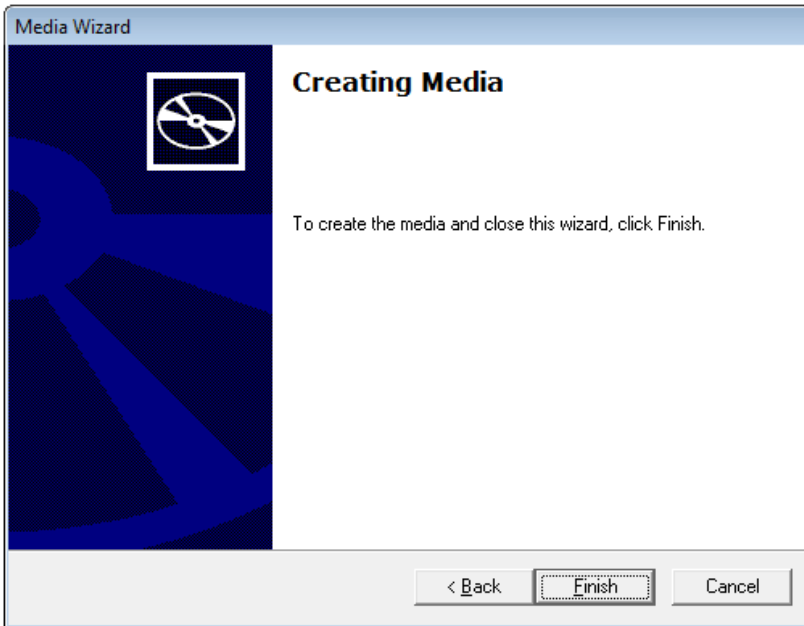


Figure 23 End of Media Wizard

15. Wait while the custom SmartPE ISO image file is created.

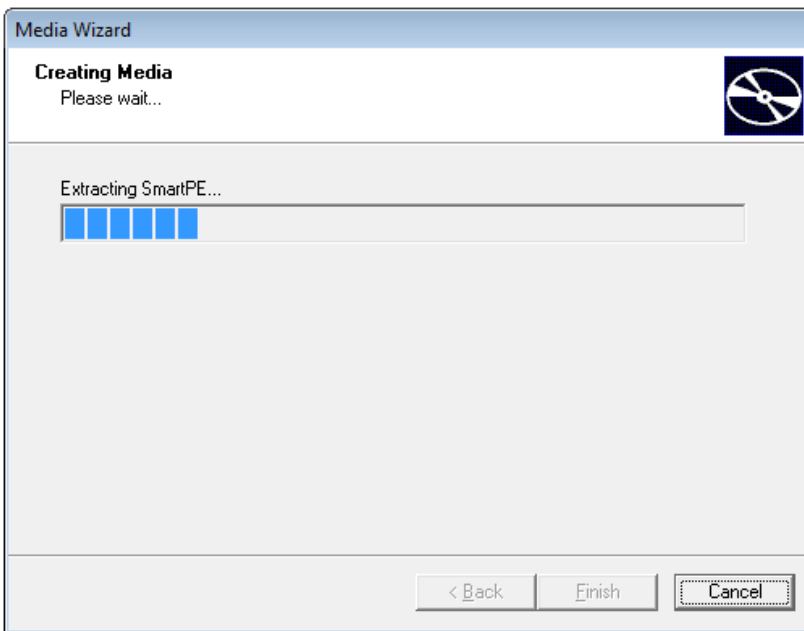


Figure 24 ISO image is being created

16. Click **OK**.

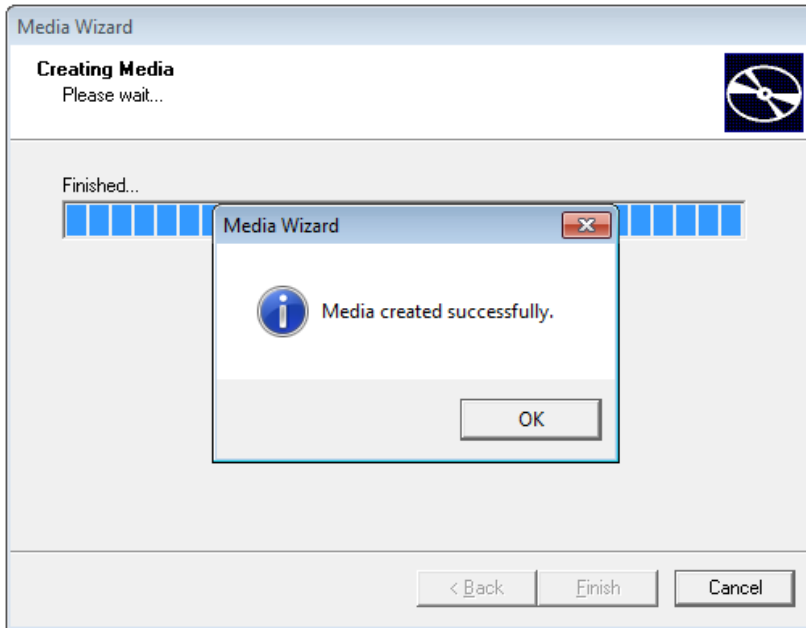


Figure 25 Media created successfully

## Boot your Target Computer to SmartPE, Run ScanState and Deploy Image

Next, you will boot the target computer using the boot media that was previously created. After the machine is booted to SmartPE we will create tasks to run at various phases of the deployment. Once the tasks are created we can complete the deployment by selecting an image and entering all needed information.

1. Boot your target computer to **SmartPE**. For this example we are using a virtual machine with the SmartPE.iso file attached, please modify accordingly to fit your needs. Select **Deploy an image** to start **Deploy Wizard**.

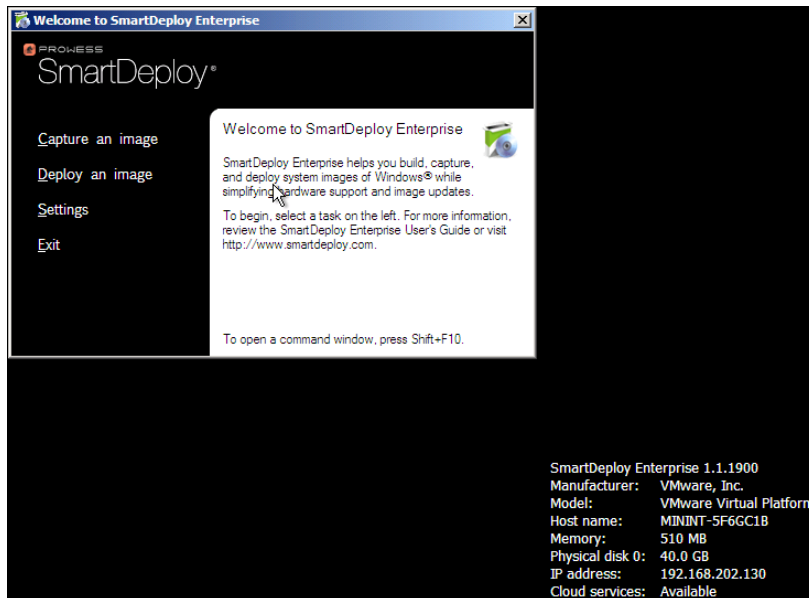


Figure 26 SmartDeploy boot environment SmartPE

2. On the **Welcome to the Deploy Wizard** page, click **Advanced**.

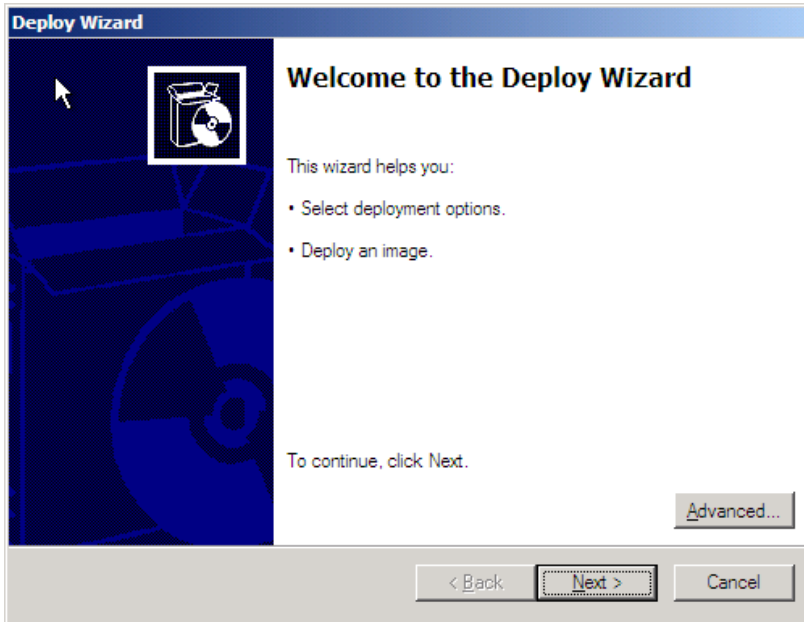


Figure 27 Welcome to the Deploy Wizard

3. From the **Advanced Options** page, click the **Tasks** tab.

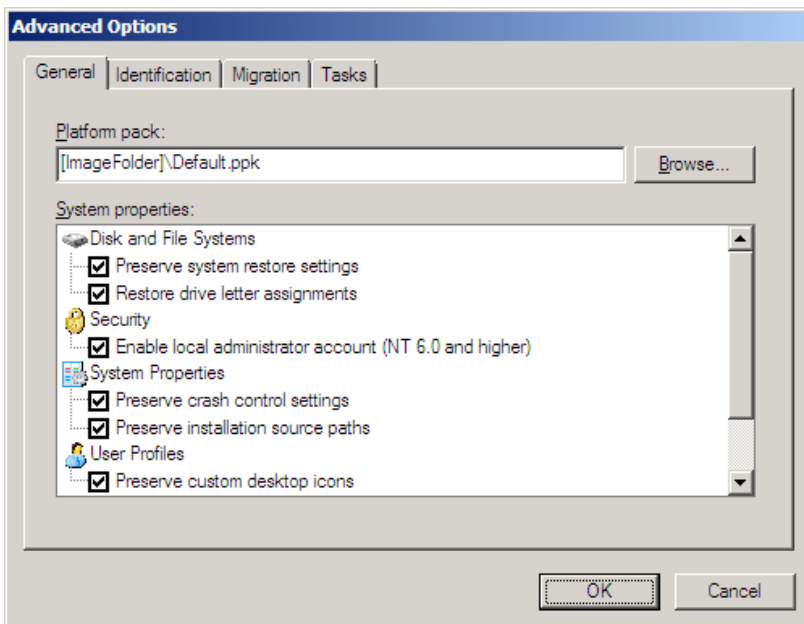


Figure 28 Deploy Wizard Advanced Options

- On the tasks tab select **Add** to add a new task.

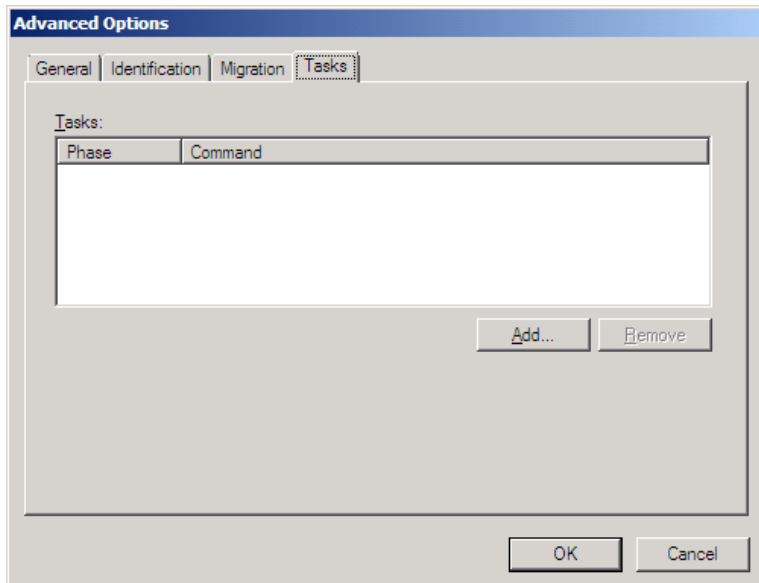


Figure 29 Tasks tab

- On the **Add / edit a task** page you can specify a command and the phase of the deployment in which it should run. This offers the flexibility to complete administrative task such as installing software that is not included in the image being deployed.

For this example ensure the **Phase** is **Before image is applied**. Change the **Command line** to **%SmartDeploy\_Media%\z\USMT\USMT.BAT** and select **OK**

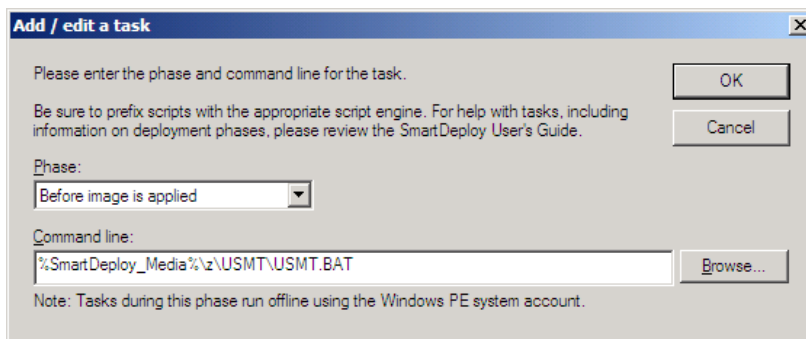


Figure 30 Add task to start ScanState

- Once again click **Add** to add a new task. From the Add / edit a task window change Phase to **First logon to desktop**, enter **C:\USMT\LoadState.exe C:\Backup /HardLink /nocompress /lac:pass@word1 /lae /c**. Click **OK** to continue.

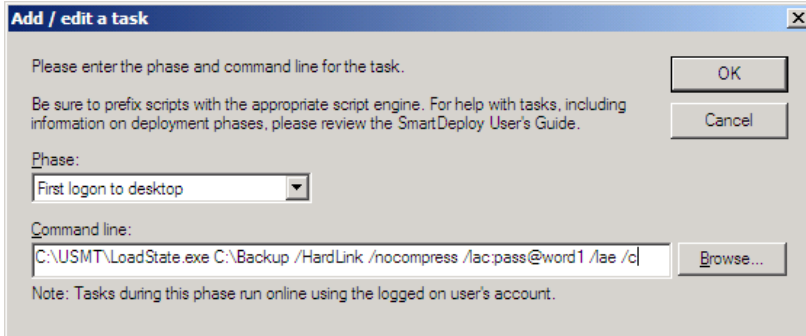


Figure 31 Add task to start LoadState

- Click **OK** to continue.

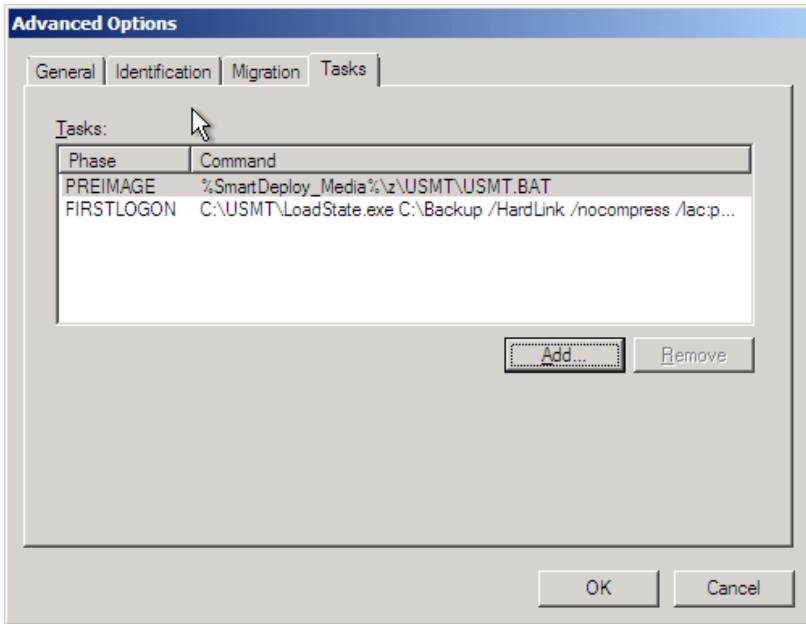


Figure 32 Task tab with all tasks created

8. From the Welcome to the Deploy Wizard page click **Next**.

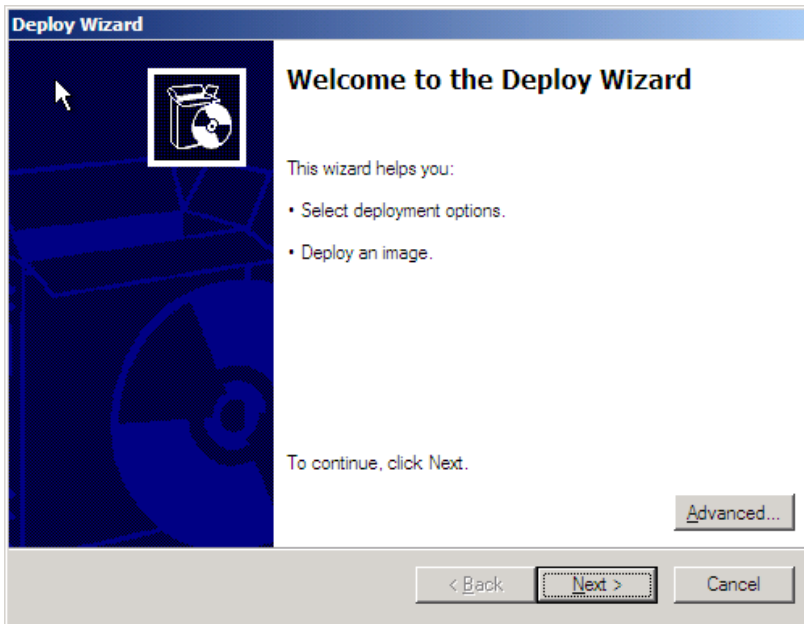


Figure 33 Deploy Wizard start page

9. On the Select Image page click **Browse** to locate an image.

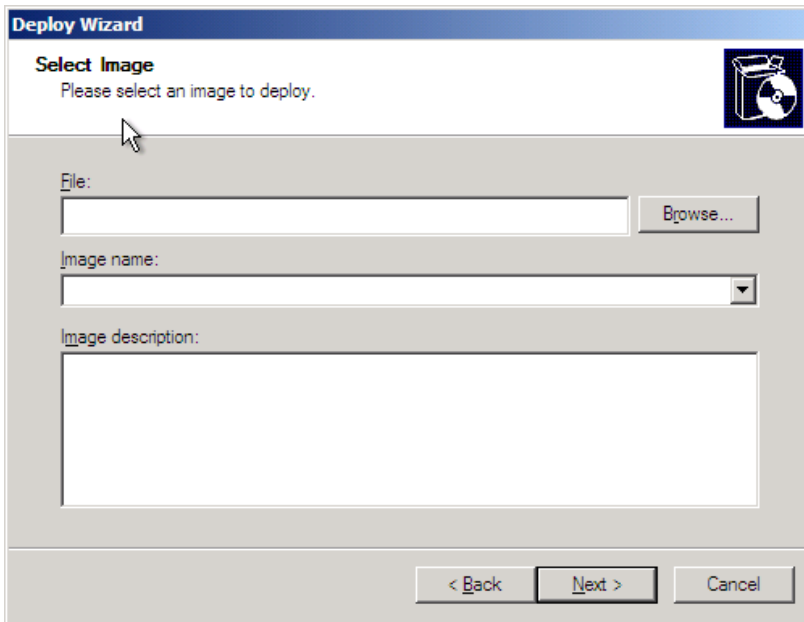


Figure 34 Browse to select image

10. In this example we will be using a network stored image. If you have a different scenario please select your image accordingly.

From the **Open** window select **Network**.

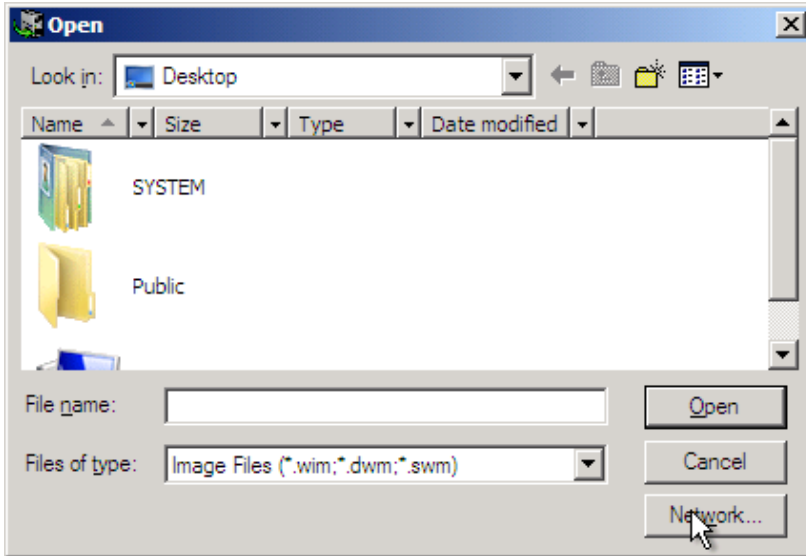


Figure 35 Select Network

11. From the **Map Network Drive** page enter the path to the network share that contains the image and will be used for the user state files, for example **\\Server\Share**, then click **OK**.

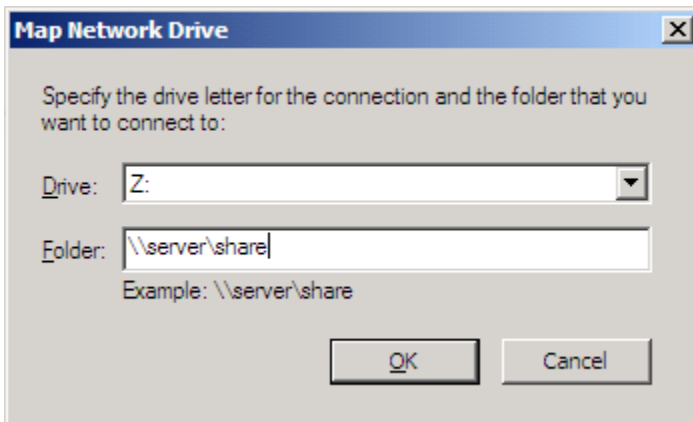


Figure 36 Map Network Drive

- Enter the credentials needed to access the network share, and then click **OK**. Please note that Domain\Username may be needed.

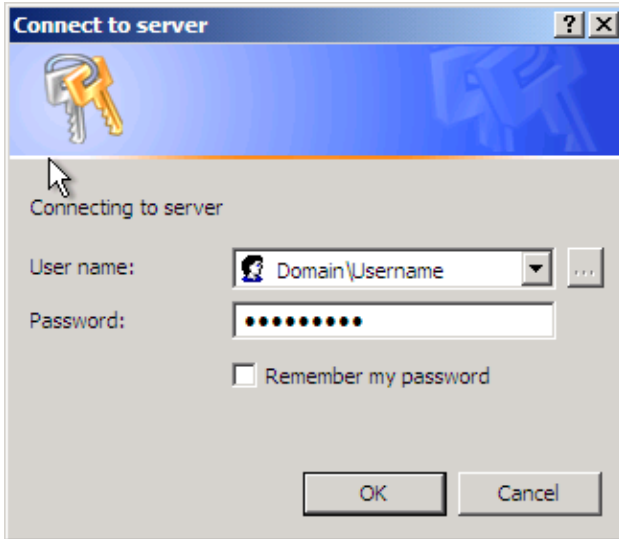


Figure 37 Enter network credentials

- Browse to and select your image. Click **Open** to continue.

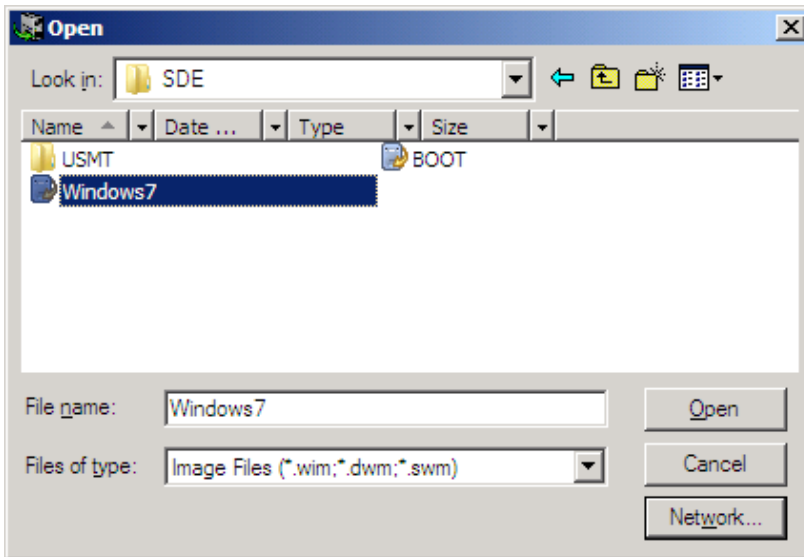


Figure 38 Browse to image

- From the Select Image page click **Next** to advance. Note if you do not have a Platform Pack named **Default.ppk** located in the same directory as the image you will be prompted to specify the location of a Platform Pack.

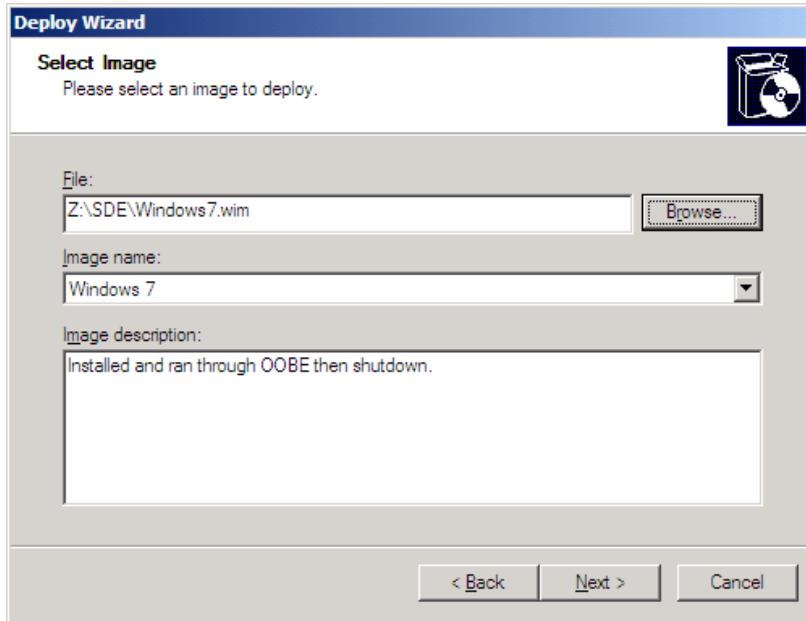


Figure 39 Select Image page

- On the **Disk Options** page change the selection to **Wipe & load drives**. This will protect the C:\Backup folder that contains all of the migrated user information. Click **Next**.

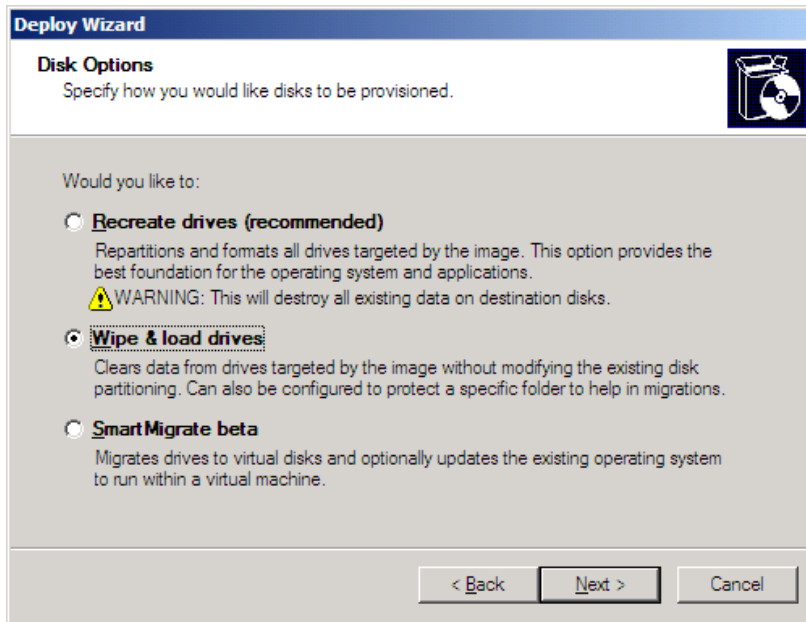


Figure 40 Disk Options page

16. If you did not specify a product key while capturing the image you will be prompted to enter a **Product Key** and select **Next**. If you do not wish to specify a product key simply click **Next**.

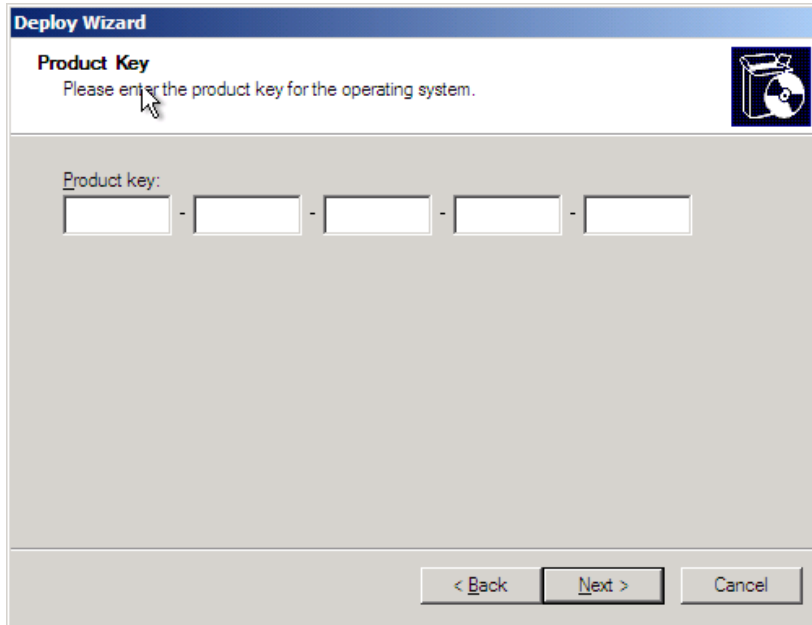


Figure 41 Product Key page

17. Enter the **Full name** and **Organization name** to be used with this deployment, select **Next**.

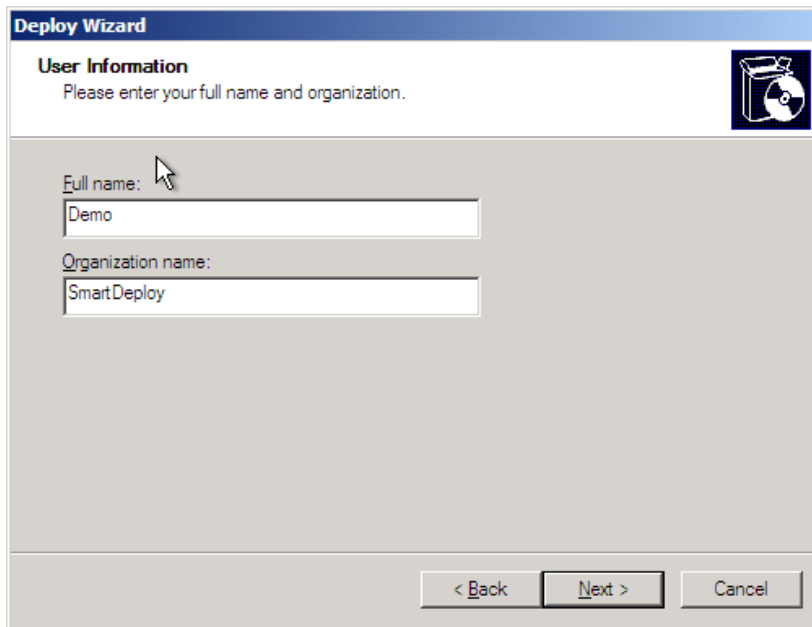


Figure 42 Enter User Information

18. Select a **Time zone** then select **Next** to continue.

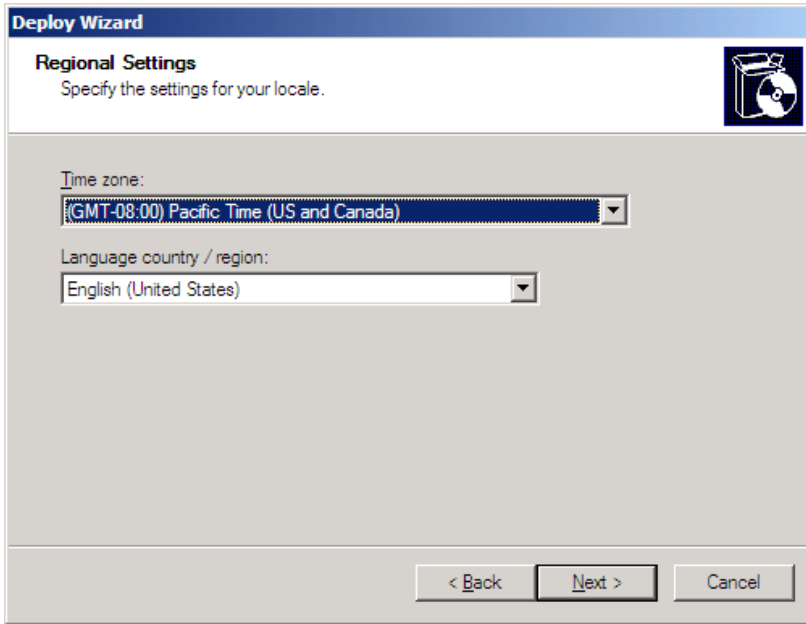


Figure 43 Regional Settings page

19. Leave the default **Display Settings** and select **Next**.

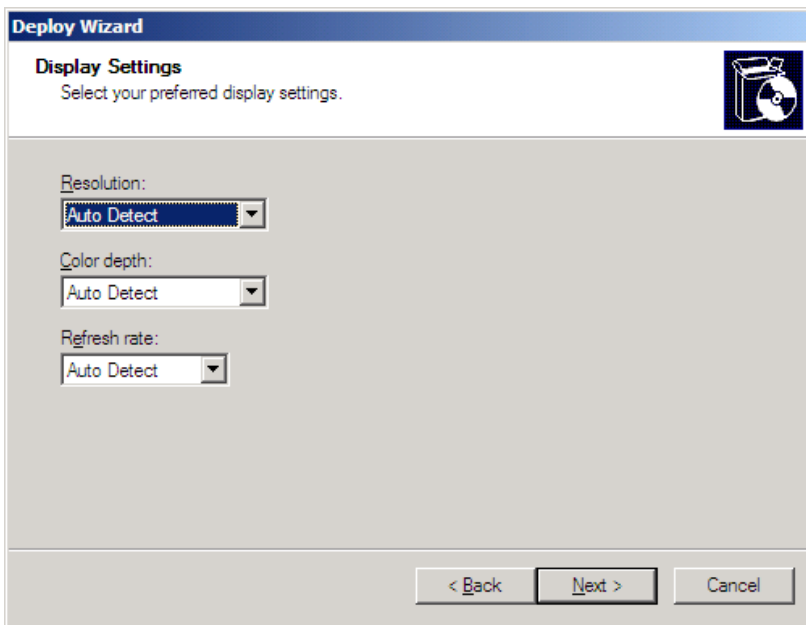


Figure 44 Display Settings page

20. Leave the default **Network Settings** and select **Next**.

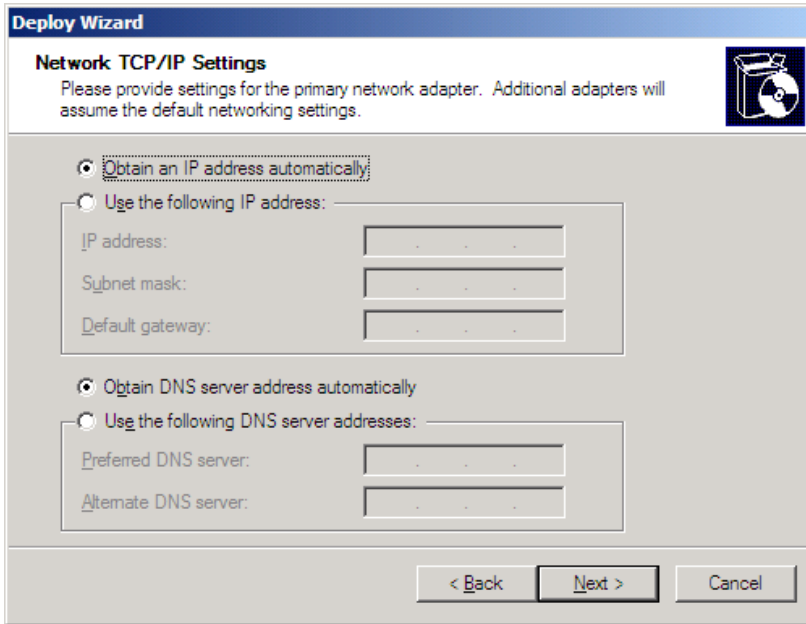


Figure 45 Network TCP/IP Settings page

21. If desired specify a **Computer name** or enter a **Domain** to join. For this example leave the defaults and select **Next**.

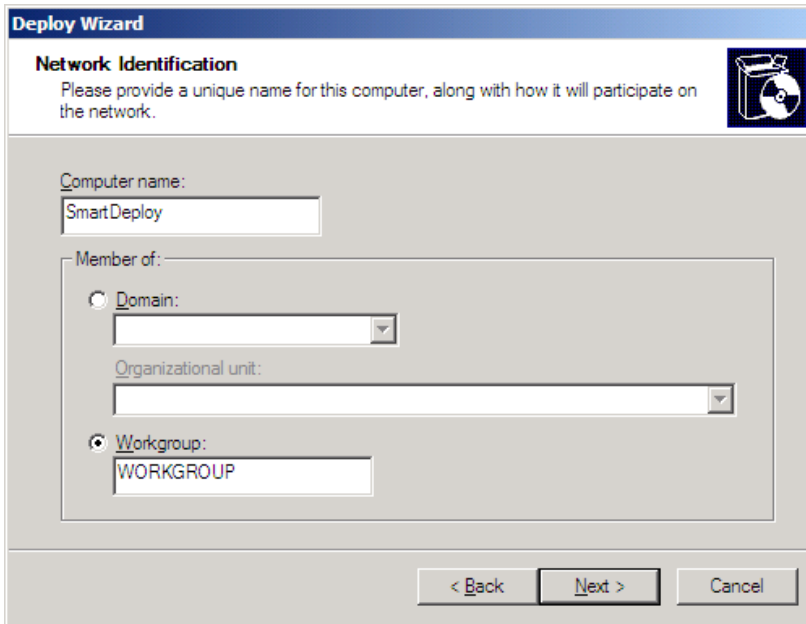


Figure 46 Enter Network Identification

22. If you would like to automate this process in the future click **Export** to save an answer file. For this example review the information and click **Next** to continue.

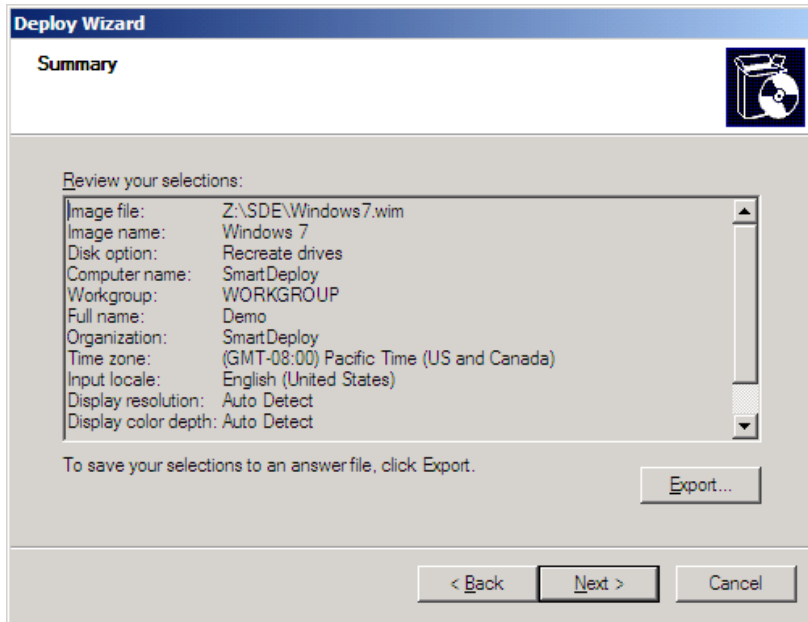


Figure 47 Summary page

23. Click **Finish** to start the deployment.

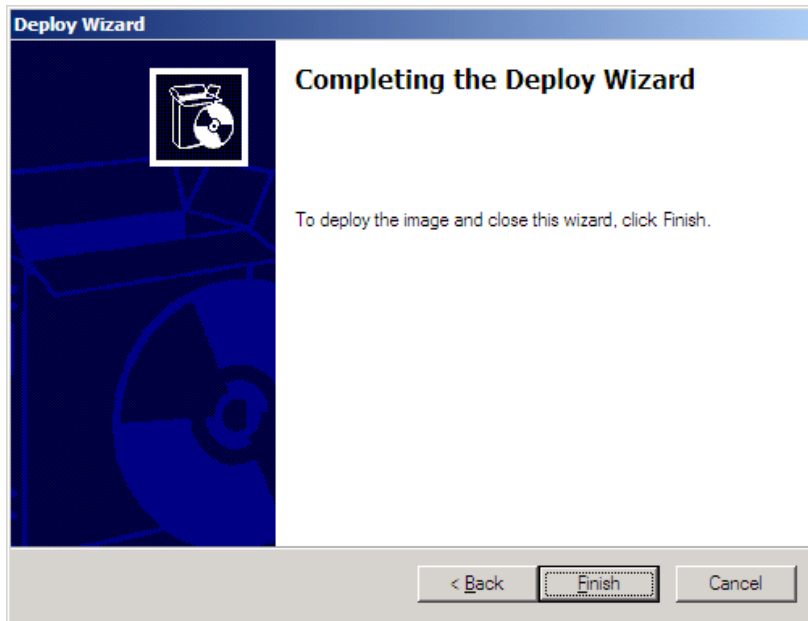
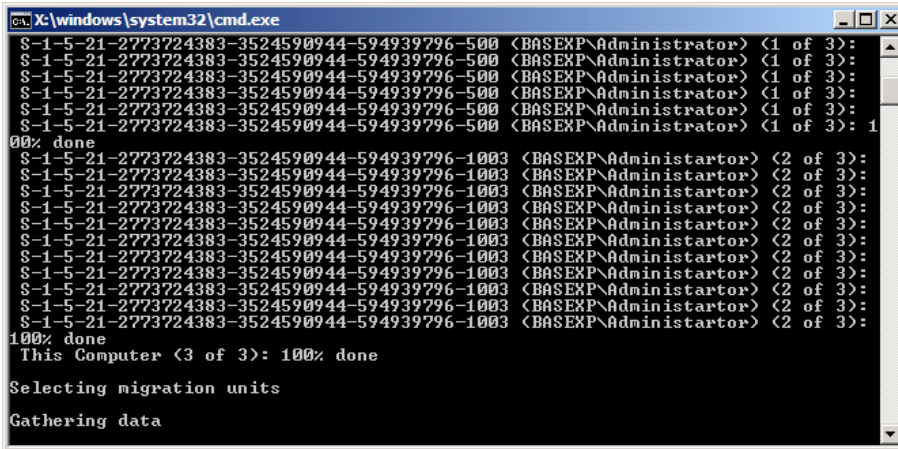


Figure 48 End of Deploy Wizard

24. Once the deployment has begun the pre image task will execute starting the USMT migration.



```

C:\windows\system32\cmd.exe
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
S-1-5-21-2773724383-3524590944-594939796-500 <BASEXP\Administrator> <1 of 3>:
00% done
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
S-1-5-21-2773724383-3524590944-594939796-1003 <BASEXP\Administrator> <2 of 3>:
100% done
This Computer <3 of 3>: 100% done

Selecting migration units
Gathering data
  
```

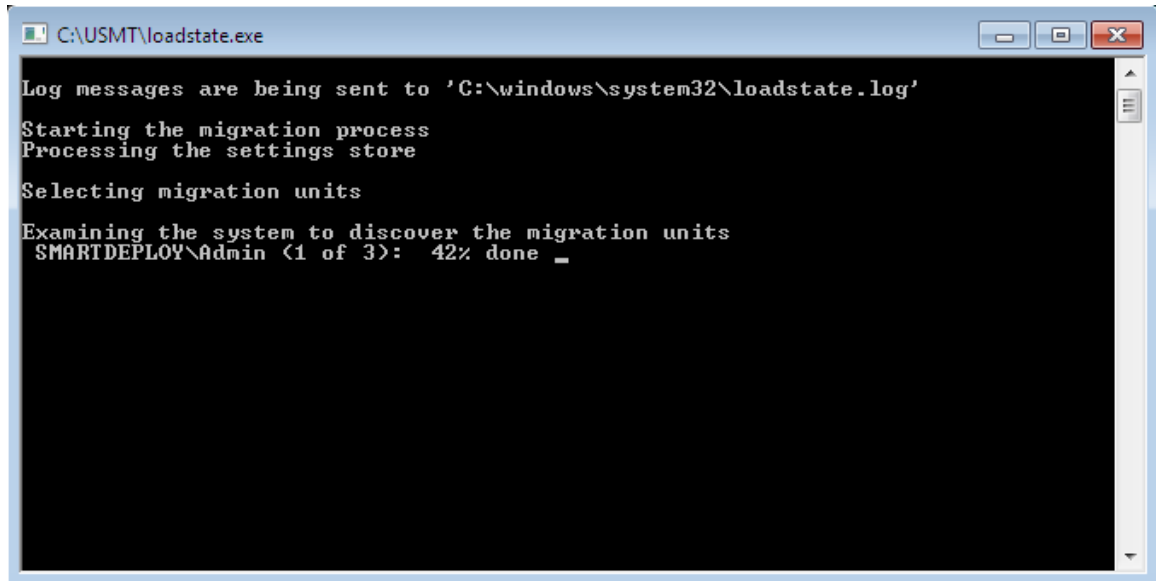
Figure 49 ScanState executing

25. Wait for the deployment to complete, sysprep to run and all settings to be applied.

## Running LoadState to Complete the Migration

Once the image has been deployed to the target machine you will be at the logon screen. You will need to logon to the computer with an account that has administrative privileges for the First logon task to complete successfully.

1. Logon to the computer with administrative credentials. Note that LoadState runs completing the migration.



```
C:\USMT\loadstate.exe
Log messages are being sent to 'C:\windows\system32\loadstate.log'
Starting the migration process
Processing the settings store
Selecting migration units
Examining the system to discover the migration units
SMARTDEPLOY\Admin (1 of 3): 42% done _
```

Figure 50 LoadState executing

2. Once LoadState finishes its tasks the migration has been completed. The C:\Backup folder can now be deleted.

## SUMMARY

---

In this example we show you how to complete a computer upgrade from Windows XP to Windows 7 while migrating user data and settings. This example can be modified to apply to other scenarios such as computer replacement.

The User State Migration Tool is a very powerful component that can be used to migrate user specific information. This will greatly reduce the amount of time spent manually copying user data and reapplying settings. However this tool will need to be tested thoroughly to ensure that all of the intended information is correctly migrated from one system to another.

## MORE INFORMATION

---

The following links provide further information:

- [SmartDeploy Enterprise User's Guide](#)
- [Microsoft User State Migration User's Guide](#)
- [Prowess SmartDeploy Home Page](#)
- [DeployCentral Forum](#)