

Intel® vPro™ Technology Use Case Reference Design

Automatic Remote Windows* 7 Migration

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1 Preface

With the release of Microsoft* Windows 7, many IT professionals are preparing for its deployment into their environments. In some cases, this will mean remotely updating employees' client PCs from Windows* XP to Windows 7. One of the challenges here is performing this update without impacting the employees' productivity. That is to say, operating system migrations take time and leave the client PC unavailable during the upgrade. Performing such an update during off hours would seem ideal. The challenge here is that the client PC may be unavailable for remote tasks. That is, it may be off or sleeping due to employees' action or system sleep timers.

This Use Case Reference Design provides theory, references, and a step-by-step example of performing an off hours, remote Windows XP to Windows 7 migration using Intel® vPro™ clients. Readers will gain insight into how they can use Intel vPro clients to enhance system availability, even during off hours, for the purpose of performing an in place, remote Windows XP to Windows 7 migration.

1.1 Document Scope

This document describes one particular scenario of how to deploy Windows 7 to an existing group of Windows XP systems using Microsoft* Configuration Manager (ConfigMgr). Please note that ConfigMgr has several ways to deploy and operating system (OS), drivers, and applications. This document includes instructions on building your Windows 7 OS, adding drivers to the drivers catalog, creating software packages for driver applications, renaming and joining the system to the domain, setting up your user state migration settings, creating a task, and advertising that task.

This document does not include local language files or include how to set up those local language settings to support a multilingual OS install.

The procedure described in this document was tested on a multi-processor platform.

The procedure in this document is supported only on Intel® AMT 4.0 and AMT 5.0.

1.2 Intended Audience

This document is intended for Information Technology (IT) professionals who need to migrate an existing Windows XP environment to Windows 7 using Microsoft ConfigMgr and client PCs with Intel vPro technology. Readers should have a good working familiarity with Intel vPro Technology, including the setup, configuration, and use of Intel AMT for out-of-band management, as well as Microsoft ConfigMgr. Readers should also be familiar with the basics of IT infrastructure, especially networked environments and their component technologies.

2 Introduction

This Use Case Reference Design demonstrates how Microsoft Windows 7 may be remotely installed onto Intel vPro clients currently running during off hours. The reader is presented with tables outlining the process and a detailed step-by-step process, complete with a running example throughout the detailed steps. The intent of this document is to provide a detailed process that you can adapt to your own IT environment and tailor to your specific needs.

2.1 Example Deployment Illustrated in This Document

This document focuses on one specific type of deployment—remotely pushing Windows 7 to Intel vPro clients currently running Windows XP. The example uses Microsoft ConfigMgr and has the following requirements:

Active Directory	<ul style="list-style-type: none"> • DNS • DHCP
ConfigMgr Server	<ul style="list-style-type: none"> • ConfigMgr 2007 Service Pack 2, configured for use with Intel vPro. See the following link: <ul style="list-style-type: none"> — http://www.microsoft.com/systemcenter/configurationmanager/en/us/default.aspx • The Windows Automated Installation Kit (AIK) for Windows 7 <ul style="list-style-type: none"> — http://www.microsoft.com/DOWNLOADS/details.aspx?familyid=696DD665-9F76-4177-A811-39C26D3B3B34&displaylang=en — If you have an older one uninstall it and install this one. • Microsoft Deployment Toolkit (MDT) 2010 <ul style="list-style-type: none"> — http://www.microsoft.com/DOWNLOADS/details.aspx?familyid=3BD8561F-77AC-4400-A0C1-FE871C461A89&displaylang=en — If you have an older one uninstall it and install this one. — Be sure to integrate it into ConfigMgr (Start > Programs > Microsoft Deployment Toolkit > Configure ConfigMgr Integration) • Power Shell (note – this is included with Windows Server 2008. The link below is for Windows Server 2003) <ul style="list-style-type: none"> — http://www.microsoft.com/downloads/details.aspx?familyid=10EE29AF-7C3A-4057-8367-C9C1DAB6E2BF&displaylang=en
Reference Intel vPro Client	<ul style="list-style-type: none"> • Example uses an Intel DQ45CB based computer but any client with Intel AMT 4.0 or higher that is capable of running Windows 7 may be used. • http://www.microsoft.com/windows/windows-7/ • http://technet.microsoft.com/en-us/windows/dd361745.aspx
Target Intel vPro Client(s)	<ul style="list-style-type: none"> • Example uses Intel DQ45CB • No local accounts on target systems • May be same as Reference Intel vPro Client • Intel AMT must be set up, configured, and activated, and be usable by ConfigMgr.

	<ul style="list-style-type: none"> – Joined to the domain – ConfigMgr Agent installed – Intel AMT set up, configured, and activated
--	--

Other types of deployments, management consoles, Intel AMT states, etc. are beyond the scope of this document.

2.2 Process Overview

The migration process is broken into two main phases; Setup and Deploy. These two phases are described at a high level in the following two overview subsections to give you a general idea of the process, then described in explicit detail throughout the body of this document. The steps in the overview tables correspond to the major subsections of the Setup and Deploy chapters, respectively.

2.2.1 Setup

The majority of the work for the migration is in the Setup phase, in which you will be creating and assembling the software “payload” to be pushed out to the target systems by ConfigMgr during the Deploy phase, and configuring ConfigMgr to properly push out the assembled payload.

Phase description	The IT Professional performs tasks to prepare for remote OS deployment.
Phase prerequisites	<ul style="list-style-type: none"> • Above Prerequisites are met. • Windows 7 Install media is available.
Phase flow	<ol style="list-style-type: none"> 1. Create drivers and software packages needed to include for the deployment of the task <ol style="list-style-type: none"> a) Create Configuration Manager Software Package. <ol style="list-style-type: none"> i) Copy Configuration Manager Client to a network share ii) Create Software Package with Configuration Manager Client b) Add Microsoft’s USMT (User State Migration Tool) Software Package. <ol style="list-style-type: none"> i) Copy USMT to a network share ii) Configure USMT (optional). iii) Create software package with USMT. c) Create Software Packages to be installed after OS load. Example: Adobe Acrobat Reader.

	<ul style="list-style-type: none"> i) Obtain Adobe and determine command line for silent install ii) Copy Adobe to a network share iii) Create Software Package with Adobe iv) Create Program in Adobe software package <ul style="list-style-type: none"> d) Create a Boot Image e) Create driver packages. <ul style="list-style-type: none"> i) Drivers Package example. ii) Software Package example. <p>2. Create an OS image</p> <ul style="list-style-type: none"> a) Install Windows 7 on reference computer. <ul style="list-style-type: none"> i) Do not install any drivers on the reference computer. You can include mass storage device drivers and Serial ATA drivers through the ConfigMgr console. ii) Do not join the system to the domain iii) Do not install the ConfigMgr agent iv) Ensure the OS is created as 1 partition v) Note: By default Windows 7 will create a hidden partition that is used for recovery. Simplify your image by setting it up as one partition that needs to be deployed. b) Create OS Image Capture Media. c) Capture reference Windows 7 install to network share as a .WIM file. d) Load .WIM file into ConfigMgr – OS image. <p>3. Create Task Sequence</p> <ul style="list-style-type: none"> a) Use Wizard. b) Edit as needed.
Phase outcome	ConfigMgr is ready to advertise Windows 7 to targeted Intel vPro clients.

2.2.2 Deploy

Once you have created and assembled the “payload” and properly configured ConfigMgr to push the payload out to the target systems, the Deploy phase can be performed. As the table below indicates, the Deploy phase consists mainly of scheduling the Task Sequence you created during the Setup phase and ensuring that the deployment has completed successfully once the Task Sequence has run.

Phase description	The IT Professional schedules remote OS deployment. During off hours Windows 7 is deployed to Intel vPro clients.
Phase prerequisites	All tasks in the Setup Phase have been completed.
Phase flow	<ol style="list-style-type: none"> 1. IT Professional Schedules a remote OS deployment for off hours. <ol style="list-style-type: none"> a) Create a Collection of Machines. b) Advertise Package to collection. 2. Employee turns off client and goes home for the day. 3. When task sequence is scheduled (off hours), PC wakes up and begins OS install. <ol style="list-style-type: none"> a) User Data is tagged for recovery. b) Windows 7 is installed over Windows XP. c) Drivers are applied through the catalog d) ConfigMgr Agent is installed. e) Driver Applications are installed. f) Core Applications are installed. g) Hotfixes are installed. h) Machine is Renamed and Rejoined to the domain. i) User Data is recovered into Windows 7.
Phase outcome	Employee arrives to find Windows 7 on his/her system. All user data has been migrated to reduce productivity loss.

3 Setup

This chapter and its subsections describe the setup process to prepare the “payload” containing Microsoft Windows 7 and necessary drivers which will be distributed to the target systems by Microsoft Configuration Manager.

3.1 Create Drivers and Software Packages

Because the drivers and other software are not part of the Microsoft Windows 7 image, they must be assembled and bundled separately for distribution by ConfigMgr. The steps in this section lead you through creating a distribution package of drivers and software.

3.1.1 Create Configuration Manager Client Software Package

Follow the steps below to create a ConfigMgr software package.

3.1.1.1 Copy ConfigMgr Client to a Network Share for ConfigMgr Use

From the ConfigMgr install folder, copy the client file and directories to a network share. The default installation folder is c:\program files\microsoft configuration manager\client. In the document example, the USMT files were copied to the network share \\dc1\public\SCCM_OSD\PKG_SRC\Client.

3.1.1.2 Create Software Package with Configuration Manager Client

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management > Software Distribution**.
2. Right-click on **Packages** and select **New > Package** from the menu.
3. In the General screen of the New Package Wizard, enter the Name (**Configuration Manager**), Version (**2007**), Manufacturer (**Microsoft**), Language (**English**), and any desired comments.
4. Click **Next**.
5. In the Data Source screen, select **This package contains source files** and click **Set**.
6. In the Set Source Directory dialog, select the **Network path (UNC name)** and enter the source directory. In the document example this is \\dc1\public\SCCM_OSD\PKG_SRC\Client.
7. Click **OK** to set the source directory and close the Set Source Directory dialog.
8. In the Data Source screen, ensure **Always obtain files from the source directory** is selected and click **Next**.
9. In the Data Access screen, ensure **Access the distribution folder through common ConfigMgr package share** is selected (default) and click **Next**.

10. In the Distribution Settings screen, set a **Sending priority** to the desired value (the document example uses **Medium**).
11. Set a desired **Preferred sender** if there is one.
12. Ensure **Automatically download content when packages are assigned to branch distribution points** is selected (default) and click **Next**.
13. In the Reporting screen, ensure **Use package properties for status MIF matching** is selected (default) and click **Next**.
14. In the Security screen, leave default values for permissions and click **Next**.
15. In the Summary screen, click **Next**.
16. In the Completed Successfully screen, click **Close**.
17. In the left-hand navigation pane, under **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution -> Packages**, select your new software package (Configuration Manager 2007 in the document example, shown below).



Figure 1: New Software Package Selected

18. Ensure there is a distribution point by performing the following steps:
 - a. Expand your software package (+), then select **Distribution Points**. Look on the right pane and see if there is a listed Distribution point. If not, right click **Distribution Points** and select **New distribution point** from the menu.
 - b. In the Welcome screen of the New Distribution Points wizard, click **Next**.
 - c. Select the **Server** (MSSCCM in the document example) and click **Next**.
 - d. In the Wizard Completed screen, click **Close**.
 - e. Your Distribution Point should now appear in the right-hand pane.

3.1.2 Add Microsoft USMT (User State Migration Tool) Software Package

Now add the Microsoft User State Migration Tool (USMT) to your distribution.



NOTE

Microsoft Windows Automated Install Kit (AIK) should already be installed on the ConfigMgr server.

3.1.2.1 Copy USMT to a Network Share for ConfigMgr Use

From the Windows AIK install folder, copy the USMT file and directories to a network share. The default installation folder is c:\program files\Windows AIK\Tools\USMT. In the document example, the USMT files were copied to the network share \\dc1\public\SCCM_OSD\PKG_SRC\USMT.

3.1.2.2 Configure USMT (optional)

USMT includes the .xml files MigApps.xml, MigDocs.xml, and MigUser.xml, which determine what will and will not be saved during a migration. At this point these files can be configured based on your specific IT needs. Please note that there are two copies of these files; one for each platform architecture. Be sure to edit the correct file. In the document's example the default USMT settings are used. Please see Microsoft's documentation at the link below for further information on configuring these files.

[http://technet.microsoft.com/en-us/library/dd560786\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd560786(WS.10).aspx)

3.1.2.3 Add USMT Software Package to ConfigMgr Console

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution -> Packages**.
2. Right-click **Packages** and select **New -> Package** from the menu.
3. In the General screen of the New Package wizard, set the following values:
 - Name = **USMT**
 - Version = **4.0**
 - Manufacturer = **Microsoft**
 - Language = **English**
 - Comments = as desired
4. Click **Next**.
5. In the Data Source screen, select **This Package contains source files** and click **Set**.

6. In the Set Source Directory dialog, select **Network Path (UNC)** and enter the source directory, then click **OK**. The example uses \\dc1\public\SCCM OSD\PKG_SRC\USMT.
7. In the Data Source screen, click **Next**.
8. In the Data Access screen, click **Next** to accept default values and proceed.
9. In the Distribution Settings screen, click **Next** to accept default values and proceed.
10. In the Reporting screen, click **Next** to accept default values and proceed.
11. In the Security screen, click **Next** to accept default values and proceed.
12. In the Summary screen, click **Next**.
13. In the Wizard Completed screen, click **Close**.
14. In the left-hand navigation pane, under **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution -> Packages**, expand your new software package (USMT) and ensure there is a distribution point by performing the following steps:
 - a. Expand your software package (+), then select Distribution Points. If there is nothing listed in the right-hand pane, then create the distribution point using the steps below.
 - b. Right-click **Distribution Points** and select **New distribution point** from the menu.
 - c. In the Welcome screen of the New Distribution Points wizard, click **Next**.
 - d. Select the Server (MSSCCM in the document example) and click **Next**.
 - e. In the Wizard Completed screen, click **Close**.
 - f. Your new Distribution Point should now appear in the right-hand pane.

3.1.3 Create Software Packages to be Installed After OS Load (Example: Adobe* Acrobat Reader)

This is an optional step. It is provided to illustrate how software such as Adobe* Acrobat Reader may be installed as part of this process. These steps can be repeated for any software desired.

3.1.3.1 Obtain Adobe Install File and Determine the Command Line to Install

From www.adobe.com download the full installer for Adobe Acrobat Reader. At the time of this writing the link is http://ardownload.adobe.com/pub/adobe/reader/win/9.x/9.1/enu/AdbeRdr910_en_US.exe

Once install package is obtained, command line parameters must be determined to perform a silent install. Usually this can be done by running the installer executable from a command line with the `/?` argument. This works for Adobe Acrobat Reader. In this case the command line we want is `AdbeRdr910_en_US.exe /sPB /rs`.

**NOTE**

Write down the command line parameter information. It will be used later in this procedure.

3.1.3.2 Copy Adobe Install File to a Network Share for ConfigMgr Use

Copy the Adobe Acrobat Reader Install file to a network share. In the document example, the file was copied to the network share \\dc1\public\SCCM_OSD\PKG_SRC\adobe.

3.1.3.3 Add Adobe Software Package to ConfigMgr Console

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution -> Packages**.
2. Right-click **Packages** and select **New -> Package** from the menu.
3. In the General screen of the New Package wizard, enter **Adobe Acrobat Reader** for Name, **9.1** for Version, **Adobe** for the Manufacturer, **English** for the Language, and any additional comments.
4. Click **Next**.
5. In the Data Source screen, select **This Package contains source files** and click **Set**.
6. In the Set Source Directory dialog, select **Network Path (UNC)** and enter the source directory and click **OK**. The example uses \\dc1\public\SCCM_OSD\PKG_SRC\adobe.
7. In the Data Source screen, click **Next**.
8. In the Data Access screen, click **Next** to accept default values and proceed.
9. In the Distribution Settings screen, click **Next** to accept default values and proceed.
10. In the Reporting screen, click **Next** to accept default values and proceed.
11. In the Security screen, click **Next** to accept default values and proceed.
12. In the Summary screen, click **Next**.
13. In the Wizard Completed screen, click **Close**.
14. In the left-hand navigation pane, under **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution -> Packages**, expand your new software package (Adobe Acrobat Reader) and ensure there is a distribution point by performing the following steps:
 - a. Expand your software package (+), then select Distribution Points. If there is nothing listed in the right-hand pane, then create a distribution point using the steps below:
 - b. Right-click **Distribution Points** and select **New distribution point** from the menu.

- c. In the Welcome screen of the New Distribution Points wizard, click **Next**.
- d. Select the Server (MSSCCM in the document example) and click **Next**.
- e. In the Wizard Completed screen, click **Close**.
- f. Your new Distribution Point should now appear in the right-hand pane.

3.1.3.4 Add a Program to the Adobe Software Package

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management > Software Distribution > Packages > Adobe Acrobat Reader > Programs**.
2. Right-click **Programs** and select **New > Program** from the menu.
3. On the General screen of the New Program Wizard, set the following values:
 - Name = **Install Adobe**
 - Command line = **AdbeRdr910_en_US.exe /sPB /rs** (you wrote this down earlier)
 - After Running = **ConfigMgr restarts computer**.
4. Click **Next**.
5. In the Requirements screen, click **Next**.
6. In the Environment screen, choose **Whether or not a user is logged on** from the Program drop-down menu.
7. Click **Next**.
8. In the Advanced screen, click **Next**.
9. In the Windows Installer screen, click **Next**.
10. In the MOM Maintenance Mode screen, click **Next**.
11. In the Summary screen, click **Next**.
12. In the Wizard Completed screen, click **Close**.

3.1.4 Create a Boot Image

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management > Operating System Deployment > Boot Images**.
2. Right-click **Boot Images** and select **Create Boot Image using Microsoft Deployment** from the menu.
3. In the Package Source dialog, enter a value for **Package Source folder to be created fill in a Network Path (UNC)**. Or click Browse to navigate to the desired location. This path is where the boot image will be created and stored. The example uses \\dc1\public\SCCM_OSD\PKG_SRC\Boot_x86.
4. Click **Next**.
5. In the General Settings screen, set the following values:
 - Name = **WinPE x86**
 - Version = **6.1.7600**
 - Comments = as desired

6. Click **Next**.
7. In the Image Options screen, set the following values:
 - Platform = **x86**
 - Optional Components =, **ADO**
 - Additional File = **Add media hook files...**
8. Click **Next**.
9. In the Summary screen, click **Next**.
10. When the wizard completes it will close by itself.



NOTE

For debugging it helps to enable the command prompt feature of the boot image. This is optional. For the example in this document, the following steps were used:

- *System Center Config Mgr -> Site Database -> Computer Management -> Operating System Deployment -> Boot Images -> WinPE x86.*
- *Right-click -> Properties.*
- *Windows PE tab -> Check Enable command support.*
- *Click OK. If prompted, update the distribution points, following the wizard with its default options.*

11. In the left-hand navigation pane, under **System Center Configuration Manager**, then expand **Site Database > Computer Management > Operating System Deployment > Boot Images**, expand your new boot image (WinPE x86 in the example) and ensure there is a distribution point by performing the following steps:
 - a. Expand your Boot Image (+), then select **Distribution Points**. If there is nothing listed in the right-hand pane, then create a new distribution point using the steps below.
 - b. Right-click **Distribution Points** and select **New distribution point** from the menu.
 - c. In the Welcome screen of the New Distribution Points wizard, click **Next**.
 - d. Select the Server (MSSCCM in the document example) and click **Next**.
 - e. In the Wizard Completed screen, click **Close**.
 - f. Your Distribution Point should now appear in the right-hand pane.

3.1.5 Setting Up and Creating Driver Packages

There are several methods of installing drivers onto your platforms. We recommend going to the OEM site and downloading all the latest drivers (it is not always a good idea to use the drivers that have come with the base operating system). By downloading the drivers or reviewing the OEM web site, you may obtain hot fixes that need to be included to fix issues for just that platform.

Once the drivers have been extracted, a ConfigMgr driver package must be created to house all the drivers for the platform which then can be deployed to a collection of specified machines.

There are many ways to configure and install device drivers for your supported platforms. Note that each customer will need to decipher how they want to group their drivers either by a collection, by vendor, by model number and create a corresponding package for those machines. For more information on creating driver packages, see the following link:

http://blogs.technet.com/inside_osd/archive/2008/04/09/importing-drivers.aspx

Also note that the boot images need to include LAN drivers. There are two locations that must be included into the boot image. One is to ensure drivers are included in the WinPE boot portion of the task, and the other is to ensure when a driver package is included, and that **Do unattended installation of unsigned drivers on versions of Windows where this is allowed** is selected.

3.1.5.1 Creating the “Driver Package”

1. Download and expand all drivers to a network share that is accessible to the ConfigMgr and the target systems (the document example uses \\dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM).
2. Create a sub folder for each driver type (for example, expand the network driver into a folder named LAN).



NOTE

Be sure to extract the driver, not just place the installer program. ConfigMgr needs to find the driver's INF file.

3. In preparation of the drivers:
 - a. Go to the OEM's web site (i.e., www.hp.com). Many sites have a support or drivers download site.
 - b. Download the drivers and keep each driver in its own folder (i.e., Video).
 - c. Once all the drivers have been downloaded (chipset, video, audio, etc.), create a folder by model number of the platform you are building.
 - d. Extract each driver into its own folder.



NOTE

Some drivers require you to run the executable (.exe file) and then redirect the path to your new folder structure or they will copy to a default location under c:\drivers or under the %temp% directory. Recommendation is \\dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM.

The steps below make a driver package for a single platform (for the purpose of this document, “platform” is defined as a particular OEM model containing a particular Intel® Desktop Board). Intel’s recommendation is to create one driver package for each platform.

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Operating System Deployment**.
2. Right-click **Driver Packages** and select **New -> Driver Package** from the menu.
3. In the New Driver Package screen, enter values for Name and Comment.
4. In the **Driver Package Source** field, enter the location where ConfigMgr will maintain the drivers (remember to use a UNC path). The document example uses \\dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM. Or, click **Browse** to navigate to the desired location.
5. Click **OK**.
6. In the left-hand navigation panel, select your new driver package (under **System Center Configuration Manager -> Site Database > Computer Management -> Operating System Deployment -> Driver Packages**) and ensure there is a distribution point by following the steps below:
 - a. Expand your new driver package (+), select Distribution Points and look on the right pane. If there is nothing selected, then right-click **Distribution Points** and select **New distribution point** from the menu.
 - b. In the Welcome screen of the New Distribution Points wizard, click **Next**.
 - c. Select the Server (MSSCCM in the document example) and click **Next**.
 - d. In the Wizard Completed screen, click **Close**.

At this point we have a driver package for this platform. The following steps add individual drivers to that package. Repeat the steps below for each driver type (remember that you split out the drivers into separate folders for each driver type).

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Operating System Deployment -> Drivers**.
2. Right-click **Drivers** and select **Import** from the menu. Note that this is NOT the Drivers item under your new driver package (see figure below).

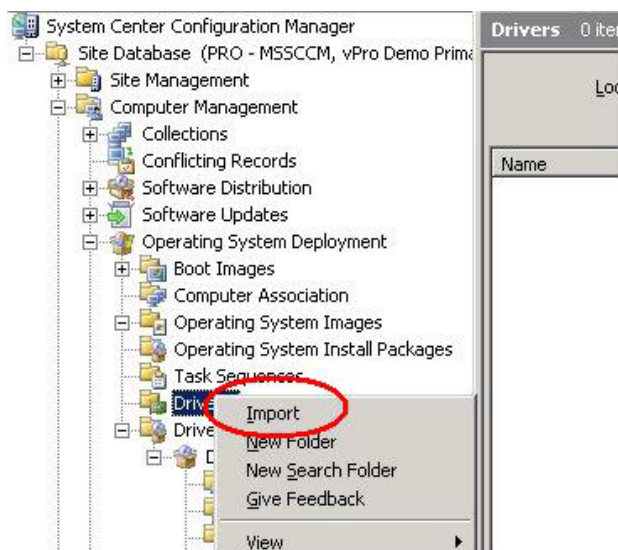


Figure 2: The Driver Import Menu

3. In the Locate Driver screen of the Import New Driver Wizard, select **Import All Drivers in the following network path (UNC)** (default) and enter the driver folder's UNC Network path (`\\dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM\<driver_type>` in the document example). Or click **Browse** to navigate to the driver folder's location and click **OK**.
4. When you have finished specifying the source folder, click **Next**.
5. In the Driver Details screen, ensure all items in the list are selected.
6. Ensure **Enable these drivers and allow computers to install them** is selected.
7. If desired, add categories for these drivers by clicking the **Categories** button. Intel recommends that you add a category for the platform and for the driver type. This will make finding and updating drivers easier in the future.
8. Click **Next**.
9. In the Add Driver to Packages screen, select the driver package you created above (in the document example, the package is named DQ45CB_Drivers).
10. Select **Update Distribution Points when finished** and click **Next**.
11. In the Add Driver to Boot Images screen, select **Boot Image (x86)**.
12. Select **Update Distribution Points when finished** and click **Next**.
13. Review the Details list of the Summary screen and click **Next**. The Progress screen is displayed. When the action has completed, the Wizard Completed screen is displayed.
14. In the Wizard Completed screen, click **Close**.

3.1.5.2 Installing Driver Software as a Software Package

Drivers using this method are installed as software. There are drivers that have an INF installation but also have specialized software that comes with it. For example, the ATI Video Driver comes with an ATI control panel applet that needs to be installed as part of the setup.exe. The goal here is to make the executable (such as setup.exe) automatic, requiring no user interaction. Most of the time the drivers that will need to be included as software packages will be the Wireless Installers, LMS Driver for the Privacy Icon applet, Audio Driver, any Virtual Private Network Programs, and the Video Driver. Included in this may also include any Driver settings like removal of desktop icons, Video Resolution, etc.



NOTE

For each driver some pre-work is required. You will need to determine the command line options that will cause the setup program to install silently. Write down these options because this information will be used later in this procedure.

Since the drivers have already been extracted above to include into the Driver Catalog, each driver that is going to be used as a Software Package will need to be run on that platform to determine what its “switches” are to ensure a automatic non-user interactive command. All drivers should be located at \\dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM as per our example.

1. Navigate to your test system.
2. Map a drive to the above location.
3. Run each command line usually a “setup.exe” and try typing in a */?* or *-?*. Most driver installer packages will display a help file that will show what silent command lines are available.
4. Run the setup.exe or command with the switches (most likely *-s* or */s*)
5. Ensure the driver installs.
6. You can also verify if desktop icons show, icons in the task bar. Some IT administrators will want to remove these. You may need to include a custom code to remove these unwanted icons OR you can configure the installer to remove them by replacing the setup.iss file.



NOTES

*Some executables will allow the user to run with a *-R* allowing a setup.iss file to be created which will answer the questions at install time. This is similar to an automation file but not all drivers allow this.*

These drivers will be install programs. Also note that these same steps can be adapted/used to install applications, hot fixes, etc. if desired.

In the ConfigMgr console, repeat the following steps for every driver:

1. In the left-hand navigation pane, expand **System Center Configuration Manager**, then expand **Site Database > Computer Management -> Software Distribution**.
2. Right-click **Packages** and select **New -> Package** from the menu.
3. In the General screen of the New Package Wizard, enter the Name, Version, Manufacturer, Language, and Comment if any.
4. Click **Next**.
5. In the Data Source screen, select **This package contains source files**.
6. Click **Set** to set the **Source Directory**.
7. Enter a network path or enter a local drive on a site server (the document example uses dc1\Public\SCCM_OSD\PKG_SRC\DQ45CB_drivers_CCM). Or, click **Browse** to navigate to the desired location.
8. Click **OK**.
9. Ensure **Always obtain files from the source directory** is selected and click **Next**.
10. In the Data Access screen, ensure **Access the distribution folder through common ConfigMgr package share** is selected and click **Next**.
11. In the Distribution screen, leave the default value for **Sending priority** as **Medium**.
12. Leave the default value for **Preferred sender**.
13. Ensure **Automatically download content when package are assigned to branch distribution points** is selected.
14. Click **Next**.
15. In the Reporting screen, ensure **Use package properties for status MIF matching** is selected and click **Next**.
16. In the Security screen, leave default values for Permissions and click **Next**.
17. In the Summary screen, click **Next**. A progress screen is displayed.
18. In the Wizard Completed screen, click **Close**.
19. In the left-hand navigation panel, under **Software Distribution**, expand **Packages**, then expand your new software package (DQ45CB_software_pkg in the example, shown below).

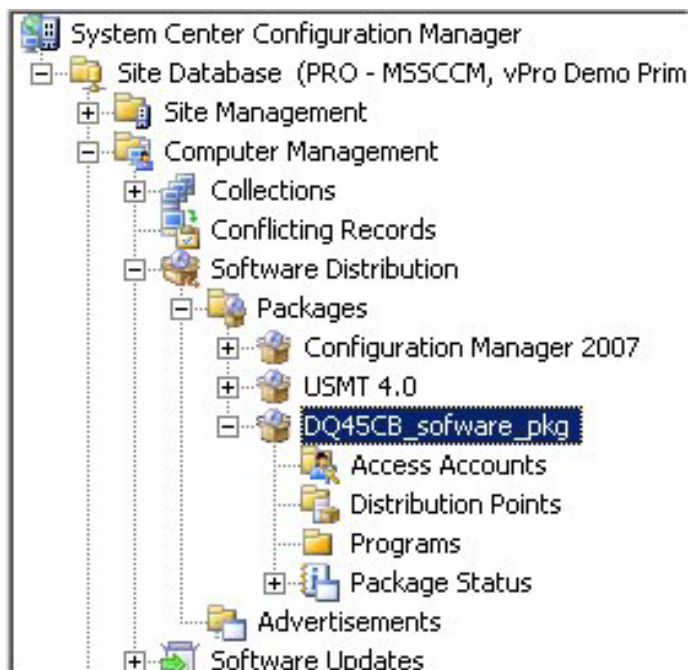


Figure 3: New Software Distribution Package

20. Under your new software package, right-click on **Programs** and select **New > Program** from the menu.
21. In the General screen of the New Program Wizard, enter the name of the software (New_Software_Pgm in the example) and any comments.
22. In the Command Line field, enter the command line and add appropriate switches (i.e. setup.exe /s). Refer to your notes from the pre-work at the beginning of this section. Or you can click **Browse** to navigate to the actual executable file and click **Open**. Once the EXE or BATCH is displayed in the field, add a space and include the switches.
23. Leave default values for the **Start in:** field.
24. Leave default values for the **Run** field.
25. Select **No action required** for the **After running** field.
26. If desired, include a **Category** (optional).
27. Click **Next**.
28. In the Requirements screen, leave default values for **Estimated disk space** and **Maximum Allowed Run Time**, and ensure **This program can run on any platform** is selected.
29. Click **Next**.
30. In the Environment screen, choose **Only when no user is logged on** for the **Program can run:** field. This allows the program to be used during an OS install.



NOTE

If Program Can Run field is not selected correctly as described above, no applications or drivers will install!

31. Select **Run with administrative rights**.
32. Select **Runs with UNC name** (default).
33. Click **Next**.
34. In the Advanced screen, if there are prerequisites, select **Run another program first** and specify the program to run.
35. Click **Next**.
36. In the Windows Installer screen, click **Next**.
37. In the MOM Maintenance screen, click **Next**.
38. In the Summary screen, click **Next**.
39. In the Wizard Completed screen, click **Close**.
40. In the left-hand navigation panel, select your software package and ensure there is a distribution point by following the steps below:
 - a. Expand your new driver package (+), select Distribution Point and check if the right pane has any points selected. If not, then right-click **Distribution Points** and select **New distribution point** from the menu.
 - b. In the Welcome screen of the New Distribution Points wizard, click **Next**.
 - c. Select the Server (MSSCCM in the document example) and click **Next**.
 - d. In the Wizard Completed screen, click **Close**.

3.2 Prepare OS Image for Push to Target Systems

This section describes how to prepare an OS image on the reference Intel vPro Client for distribution to the target systems during the Deploy phase.

3.2.1 Install Windows 7 on Reference Intel® vPro™ Client

This is your reference Windows 7 installation. It will be applied to all target Intel vPro clients during the Deploy phase. You can configure the installation as needed for your environment, but keep flexibility in mind to allow for the drivers, hotfixes, applications, etc. to be loaded onto the target systems through ConfigMgr after the initial OS load.

1. Insert the Windows 7 DVD into your Reference Intel vPro Client.
2. Install Win 7 the way you want it configured for your environment, with the following caveats:
 - a. Do not install any drivers.
 - b. Do not install the ConfigMgr agent.
 - c. Do not join the system to the domain.
 - d. Be sure to create the user name Admin.
 - e. Do not give the Admin user a password.
 - f. Do NOT allow the installer to create an extra 100 MB partition. See note below.

**NOTE**

By default, Windows 7 installs with a 100 MB partition for recovery operations. This partition makes remote deployment more challenging. To avoid this do the following:

1. *Boot the Win 7 install Media.*
2. *Select Repair Your Computer.*
3. *Select Use Recovery tools and click Next.*
4. *Open a command prompt.*
5. *Use diskpart to create and format a single partition that fills the hard drive.*
6. *Reboot to the Windows 7 media and install to the partition created above.*

For more information: <http://www.mydigitallife.info/2009/08/20/hack-to-remove-100-mb-system-reserved-partition-when-installing-windows-7/>

3.2.2 Create OS Image Capture Media

In this step you will create a media file of the Windows 7 operating system and burn it to a CD.

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Operating System Deployment** and select **Task Sequences**.
2. Right-click **Task Sequences** and select **Create task sequence media** from the menu.
3. In the Select Media Type screen of the Task Sequence Media Wizard, select **Capture media** and click **Next**.
4. Select **CD/DVD Set**.
5. In the **Media file** field, enter the path and filename for the output media file (for example, c:\cap.iso).
6. Click **Next**.
7. In the Boot Image screen, click **Browse** and select **WinPE x86** for the boot image.
8. Set the **Distribution point** to be your server (in the example we use MSSCCM).
9. Click **Next**.
10. In the Summary screen, click **Next**. A progress screen is displayed.
11. In the Wizard Completed screen, click **Close**.
12. Burn a CD of the image file from media path and filename you created in step 5. Label the CD as **ImageUp**.

3.2.3 Capture Reference Windows 7 Installation to Network Share

In this step you will place the reference Windows 7 media file(s) on a network share where it can be distributed to the target clients by ConfigMgr.

1. Insert the ImageUp CD you created in the previous section (3.2.2 Create OS Image Capture Media) into the CD-ROM drive of the Reference Intel vPro Client. If the CD does not automatically launch, double-click on the CD-ROM drive icon. If you have issues ensure that the CD-ROM is connected and has drivers loaded. If prompted, choose **Run TSMBAutorun.exe**.
2. Accept all default settings by clicking **Next** through all screens, with the following exceptions:
 - a. In the Image Destination screen, for **Destination** use a network share. In the document's example the share \\dc1\Public\SCCM_OSD\PKG_SRC\Win7_img\win7.wim was used.
 - b. In the Image Destination screen, for **Account Name** use an account that has write access to the share above. In the document example, the account is vprodemo\itproadmin.
 - c. In the Image Information screen, enter values for **Created by**, **Version**, and **Description**.
 - d. Click **Finish**.
3. Once you have clicked through all of the screens, do not touch the system while the installation is running.
4. The system will begin to go through sysprep; once the system completes this process it will image the sysprep generic image up to the server to the specified location.
5. When the process completes, the system will display the Image Completed Wizard with the message **Image successfully captured to <path>**. Click **OK** to restart the computer and run Windows Setup.

3.2.4 Load the .WIM File Into ConfigMgr – OS Image

In this step you will specify to ConfigMgr the location and filename of the OS image to be distributed, and create a ConfigMgr OS image entry.

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Operating System Deployment** and select **Operating System Images**.
2. Right-click **Operating System Images** and select **Add Operating System Image** from the menu.
3. In the Data Source screen of the Add Operating System Image Wizard, enter the UNC path of the captured image (in the document's example this is \\dc1\Public\SCCM_OSD\PKG_SRC\Win7_img\win7.wim) or you can click **Browse** and select the WIM image, then click **Open**.

4. Click **Next**.
5. In the General screen, accept default values for all fields or modify as desired. Click **Next**.
6. In the Summary screen, click **Next**.
7. In the Wizard Completed screen, click **Close**.
8. In the left-hand navigation pane, under **Operating System Images**, expand (+) the new image (note: the name will be whatever you entered for "Name" in the General screen of the wizard).
9. Under your new image, right-click **Distribution Points** and select **New Distribution Points** from the menu, as shown in Figure 4 below.

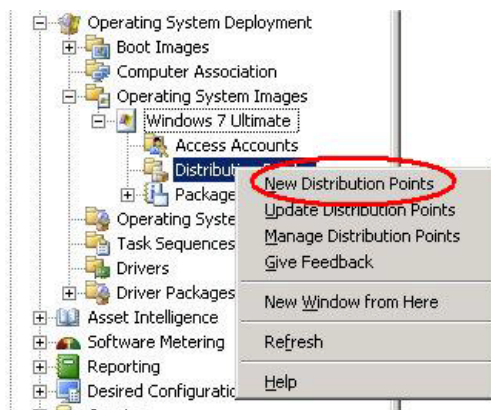


Figure 4: Distribution Points Menu for New Image

10. In the Welcome Screen of the New Distribution Points Wizard, click **Next**.
11. Select the desired distribution point (in the document's example, this is **MSSCCM**).
12. Click **Next**.
13. In the Wizard Completed screen, click **Close**.

3.3 Create Task Sequence

In this section, you will create a ConfigMgr task sequence which can be scheduled to push the OS image and drivers out to the target clients.

3.3.1 Use the Wizard to Create the Task Sequence

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Operating System Deployment** and select **Task Sequences**.
2. Right-click on **Task Sequences** and select **Create Microsoft Deployment Task Sequence** from the menu.

3. In the Choose Template screen select **Client Task Sequence** (default) and click **Next**.
4. In the General screen, enter a **Task Sequence Name** and **Comment**. This example uses **Windows 7 Refresh**. Click **Next**.
5. In the Details screen, specify your desired domain or workgroup. The document example uses **vprodemo.com** for the domain and **vprodemo\itproadmin** for the account. Also, enter your Windows 7 product key if applicable. Click **Next**.



NOTE

If you are unable to join the domain due to your credentials you can either choose to create the account before building the machine, reuse the last computer name on the client machine and move the machine to the new OU if needed, or have an account that has full access to create and join the machine to the domain, or use the automated code provided in Appendix B: Alternative Method for Joining the Managed Client to the Console Domain on page 39 to rename and rejoin the machine to the domain as a software package.

6. In the Capture Setting screen, leave the default selection of **This task sequence will never be used to capture and image** and click **Next**.
7. In the Boot Image Screen, select **Specify an existing boot image package**. For **Boot Image**, click **Browse** and select **WinPE x86**, then click **OK**.
8. Click **Next**.
9. In the MDT Package screen, select **Create a New Microsoft Deployment Toolkit Files Package**. Enter the UNC to store this package source (the document example uses \\dc1\Public\SCCM_OSD\PKG_SRC\MDT). Click **Next**.
10. In the MDT Details screen, set the following values:
 - Name = **MDT**
 - Version = **2010**
 - Language = **English**
 - Manufacturer = **Microsoft**
 - Comments = as desired
11. Click **Next**.
12. In the OS Image screen, leave the default value, **Specify an existing OS image**, selected. Click **Browse** next to the selected option and select the MDT package you just created (the document example uses the package name MDT). Click **OK**.
13. In the OS Image screen, click **Next**.
14. In the Client Package screen, select **Specify an existing ConfigMgr client package** (default) and click **Browse**.
15. Select the ConfigMgr client package created earlier (Configuration Manager in the document example) and click **OK**.
16. In the Client Package screen, click **Next**.
17. In the USMT Package screen, select **Specify an existing USMT package** (default) and click **Browse**.
18. Select the USMT package created earlier (USMT in the document example) and click **OK**.

19. In the USMT Package screen, click **Next**.
20. In the Settings Package screen select **Create a new settings package**. In the Package source folder field enter a UNC path to store the source files for this package. This will create a template customsettings.ini which we will later edit. For UNC path the document example uses \\dc1\Public\SCCM_OSD\PKG_SRC\MDT_Settings
21. In the Settings Details screen, set the following values:
 - Name = **DQ45CB MDT Settings**
 - Version = **1**
 - Language = **English**
 - Manufacturer = **Microsoft**
 - Comments = as desired
22. Click **Next**.
23. In the sysprep package screen leave the default value **No Sysprep package is required selected** and click **Next**.
24. In the Summary screen, click **Next**. When the wizard completes it will automatically close.

3.3.2 Modify Task Sequence as Needed

Follow the steps below to modify your new task sequence.

1. In the right-hand pane of ConfigMgr, right-click your new task sequence and choose **Edit** from the menu.
2. In the left-hand navigation pane of the Task Sequence editor, under **State Capture**, select **Capture Network Settings**.
3. In the left-hand navigation pane, under **Post Install**, select **Auto Apply Drivers**.
4. In the left-hand navigation pane, right-click **Auto Apply Drivers** and choose **Delete** from the menu. Click **Yes** in the warning dialog.
5. From the Task Sequence Editor menu bar, click **Add -> Drivers -> Apply Driver Package**. See Figure 5 below.



Figure 5: Add menu for Task Sequence Editor

**NOTE**

The new task, **Apply Driver Package**, is added to the sequence with a red “X” icon instead of a green “checkmark” icon. This is normal, since you have not yet selected a package for the task to apply (you will do this in step 8 below).

6. Move the **Apply Driver Package** task so it is just below **Configure**, as shown in Figure 6. (Hint: If you select **Configure** first before adding the driver package to the sequence, the editor will automatically put the **Apply Driver Package** task right below Configure).

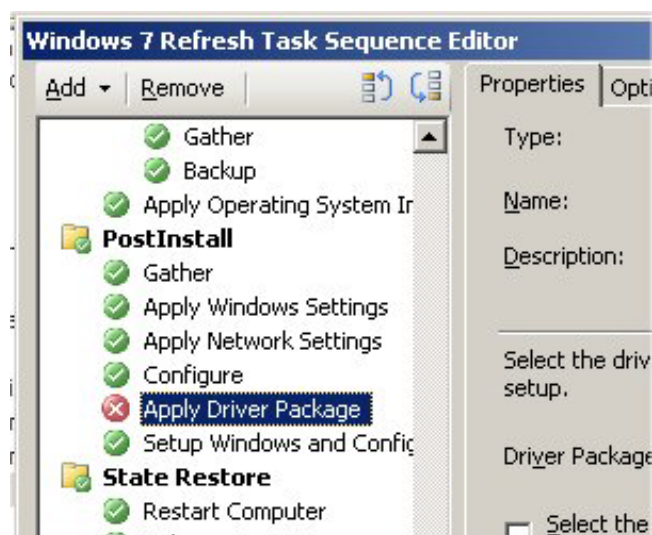


Figure 6: “Apply Driver Package” Position in Task Sequence

7. In the **Properties** tab of the right-hand pane, click the **Browse** button next to the **Driver Package** field.
8. Select the driver package created above (in the document example this is DQ45CB_Drivers) and click **OK**.
9. Select **Do unattended installation of unsigned drivers....**
10. Optional: If you want the PC to have the same domain membership as before, perform the following: in the Properties tab of the right-hand pane, select **Migrate domain and work group membership**.
11. Optional: If you want to specify an org unit for the new computer account, perform the following:
 - a. Select **Apply Network Settings**.
 - b. In the Properties tab fill in a desired value for **Domain OU**. This example uses LDAP://OU=Validation,DC=vprodemo,DC=com
12. Optional: If you want to install software packages after the OS install, perform the following (in this example we use the Adobe software package created earlier).
 - a. In the left-hand navigation pane, under **Post Install**, select **Setup Windows and ConfigMgr**.

- b. Click the Add menu button at top left and select **General > Install Software**. The new install Software task appears below Setup Windows and ConfigMgr.
 - c. In the Properties tab click **Browse** next to the **Package** field and select the Adobe software package you created earlier.
 - d. Click **OK** to close the dialog, then select **Install Adobe** for the **Program** field.
 - e. Repeat steps a – d to add any driver software packages or additional software packages as needed.
13. Click **OK**.

3.3.3 Modify Customsettings.ini as Needed

In the Task Sequence Wizard, you created a new MDT settings package. Now you need to modify it and then place it on a distribution server.

1. Open the UNC path to the MDT settings package source. This example uses \\dc1\Public\SCCM_OSD\PKG_SRC\MDT_Settings.
2. Open CustomSettings.ini in a text editor such as Notepad.
3. Edit the file so that it looks like the following:

```
[Settings]
Priority=Default
Properties=MyCustomProperty

[Default]
OSInstall=Y
ScanStateArgs=/v:13 /o /c
LoadStateArgs=/v:13 /c /lac /lae
```

4. Save and close the CustomSettings.ini file.

In the ConfigMgr Console, add a distribution point for your MDT Settings software package by performing the following steps:

1. In the left-hand navigation pane, under System Center Configuration Manager, then expand Site Database > Computer Management -> Software Distribution -> Packages, expand your MDT Settings software package (DQ45CB MDT Settings).
2. Expand your software package (+), then select **Distribution Points**. If there is nothing listed in the right-hand pane, then create one using the steps below.
3. Right-click **Distribution Points** and select **New distribution point** from the menu.
4. In the Welcome screen of the New Distribution Points wizard, click **Next**.
5. Select the Server (MSSCCM in the document example) and click **Next**.
6. In the Wizard Completed screen, click **Close**.
7. Your Distribution Point should now appear in the right-hand panel.

Your task sequence is now prepared. You are now ready to proceed to the Deploy phase in the next chapter.

4 Deploy

This chapter leads you through scheduling the remote OS deployment (i.e., your new task sequence) for off hours.

4.1 Create a Collection of Machines

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Collections**.
2. Right-click **Collections** and choose **New -> Collection** from the menu.
3. In the General screen of the New Collection Wizard, enter the name for your collection in the **Name** field (in the document example, we use DQ45CB w XP) and add any comments.
4. Click **Next**.
5. In the Membership Rules screen, click the **Query Rules Properties** button (shown below).

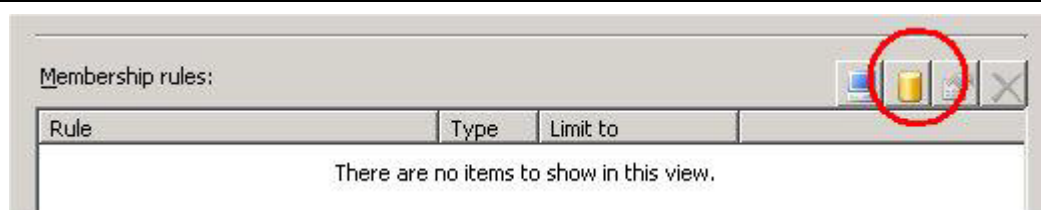


Figure 7: Query Rules Properties Button

6. In the Query Rule Properties dialog, enter a name as desired (in the document example we use DQ45CB w XP).
7. Click **Edit Query Statement**.
8. In the Query Statement Properties dialog, select the **Criteria** tab.
9. Click the **New Criteria** button (shown below).

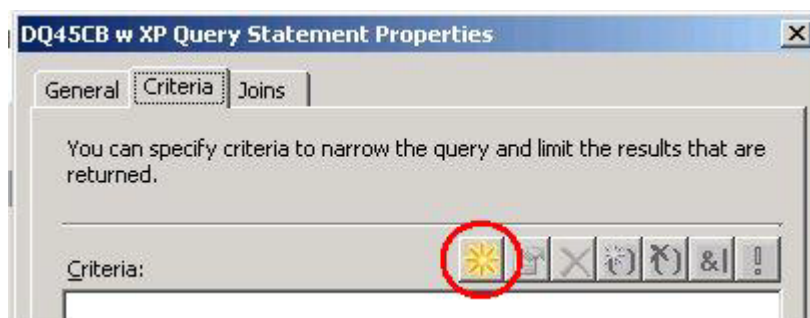


Figure 8: The New Criteria Button

10. In the Criterion Properties dialog, leave the **Criterion Type** as **Simple value** and click **Select**. Enter the following information:
 - Attribute Class = **Computer system**
 - Alias as = **<No Alias>**
 - Attribute = **Manufacturer**
11. Click **OK**.
12. Leave **Operator** as **is equal to** and click **Value**. Choose your Intel vPro system manufacturer from the list (in the example this is INTEL_).
13. Click **OK**.
14. In the Query Statement Properties screen, click the **New Criteria** button again.
15. In the Criterion Properties dialog, click **Select** and enter the following information:
 - Attribute Class = **Computer system**
 - Alias as = **<No Alias>**
 - Attribute = **Model**
16. Click **OK**.
17. Leave Operator as is equal to and click **Value**. Choose your Intel vPro system model from the list (in the example this is DQ45CD__).
18. Click **OK**.
19. Click the **New Criteria** button again (if necessary, deselect the second entry in the criteria window).
20. Leave **Criterion Type** as **Simple value** and click **Select**., Enter the following:
 - Attribute Class = **Operating System**
 - Alias as = **<No Alias>**
 - Attribute = **Version**
21. Click **OK**.
22. Leave **Operator** as **is equal to** and click **Value**. Choose **5.1.2600**, then click **OK**.
23. In the Criterion Properties dialog, click **OK**. At this point, your Query Statement Properties dialog should look similar to the example in Figure 9 below.

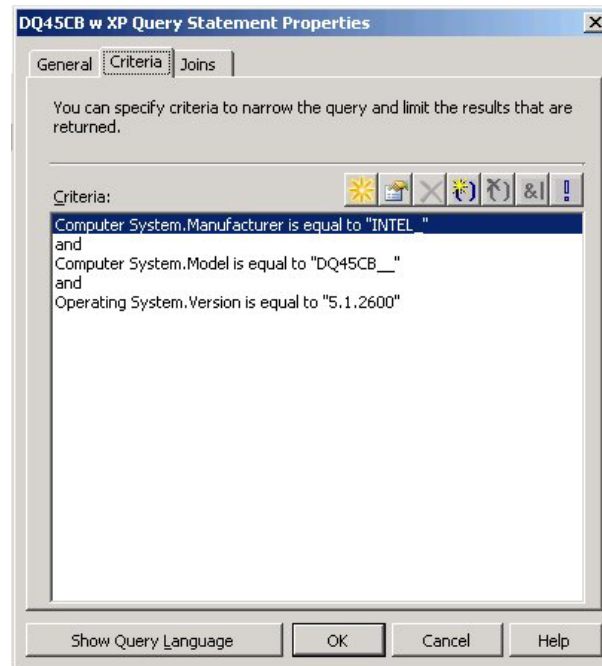


Figure 9: The Query Statement Properties Dialog

24. In the Query Statement Properties dialog, click **OK**.
25. In the Query Rule Properties dialog, click **OK**.
26. In the Membership Rules screen of the New Collection Wizard, click **Next**.
27. In the Advertisements screen, click **Next**.
28. In the Security screen, click **Next**.
29. In the Confirmation screen, click **Close**.

This collection will now show all systems of a given manufacturer and model that have Windows XP. By default this collection will update once a day. To force an update, do the following:

1. Right-click the new collection (**DQ45CB w XP** in the example).
2. Choose **Update Collection Membership** from the menu.
3. In the informational dialog, choose **Update subcollection membership** if desired, then click **OK**.
4. Select the collection.
5. Press **F5** to see the changes.

4.2 Advertise Package to the Collection of Machines

Follow the steps below to schedule the task sequence to be executed.

In the ConfigMgr Console, perform the following steps:

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Operating System Deployment -> Task Sequences**.
2. Right-click the task sequence that you created in the previous steps (in the document example this is Use_case_ref_design_task_sequence) and select **Advertise** from the menu.
3. In the General screen of the New Advertisement Wizard, the **Name** field should already display your task sequence's name. Add comments if desired.
4. The **Task Sequence** field should already be populated with the name of your task sequence.
5. For the **Collection** field, click **Browse**, then select the collection you created in the previous step (**DQ45CB w XP** in the example) and click **OK** to close the Browse Collection dialog.
6. Ensure **Include members of subcollections** is selected (default).
7. Select **Make this task sequence available to boot media and PXE**.
8. Click **Next**.
9. In the Schedule screen, click the yellow sun icon in the **Mandatory assignments** section.
10. In the Assignment Schedule dialog, you can EITHER choose to schedule the task sequence at a specific date and time (to do this, select **Assign to the following schedule** and then click **Schedule** to set the date, time, and recurrence)
- OR -
you can specify an event after which the task sequence will start (select **Assign immediately after this event** and select an event from the drop-down menu: logon, logoff, or as soon as possible).



NOTE

*We suggest you schedule the task in the off hours so as not to impact employee productivity. If you do select **Assign immediately after this event**, we recommend that you choose **As soon as possible**.*

If desired for testing purposes, you can also leave the advertisement as an optional advertisement by not filling in the mandatory assignments. If any changes are made to the advertisement we recommend that you delete the advertisement and recreate it. You can delete your advertisements from System Center Configuration manager -> Site Database -> Computer Management -> Software Distribution -> Advertisements. You may need to refresh the screen to see the new advertisements.

11. Click **OK** to close the Assignment Schedule dialog.

12. Select **Enable Wake On LAN** (this is the part of the procedure that actually uses Intel vPro technology. This allows the computer to be off or asleep and still wake up to receive the OS deployment.)
13. Select **Ignore maintenance windows when running program**.
14. Select **Allow system restart outside maintenance windows**.
15. Set **Priority** to **High**.
16. Leave **Program rerun behavior** as **Never rerun advertised program**.
17. Click **Next**.
18. In the Distribution Points screen, leave **Download content locally when needed by running task sequence** selected (default) and click **Next**.
19. In the Interaction screen, leave **Show the task sequence progress selected** (default) and click **Next**.
20. In the Security screen, leave the default security values and click **Next**.
21. In the Summary screen, click **Next** to create the new advertisement.
22. In the Wizard Completed screen, click **Close**.

4.3 Off-hours Task Sequence Execution

At this point the employees can turn off their clients and go home for the day. When scheduled in ConfigMgr, the client PCs wake up and begin the OS installation according to the task sequence. When employees arrive in the morning, Windows 7 is installed and their data is still on their system.

Once the update has completed the system will no longer show up in the collection since it no longer has Windows XP installed.



NOTE

The task sequence will not be run until the ConfigMgr agent has run a software scan and the Collection membership has been updated. This can be forced as follows:

To force a software scan, on the Intel vPro system with its new OS, open the Configuration Manager control panel and select the actions tab. Choose Software Inventory Cycle, then click Initiate action.

To force a collection membership update, on the ConfigMgr Console, right-click the new collection and choose Update Collection Membership. Select the collection and press F5 to see the changes.

5 Appendix A: Troubleshooting Tips

Refer to the notes below for help in addressing issues encountered while performing the steps outlined in this document.

Ensure the password and user accounts are correct

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Site Management -> Primary Site -> Site Settings**.
2. Select **Client Agents**.
3. Right-click on the **Computer client Agent** and select **Properties** from the menu.
4. Under the general tab, ensure that the **Network Access Account** is set to the username and password of a domain account user, then reset the password.

Check to see if the boot image (x86) has WinPE drivers for your platform

1. In the left-hand navigation pane, expand **System Center Configuration Manager -> Site Database -> Computer Management -> Operating System Deployment -> Boot Images**.
2. Right-click on the boot image (**x86**) and select **Properties** from the menu.
3. Select the Windows PE tab.
4. Add the corresponding drivers.
5. Ensure **Enable command support** is selected.
6. Ensure the **Distribution Points** field is configured to your server.

Install Microsoft Windows* Automated Install Kit (AIK)

1. Download the Windows 7 AIK from the link below and burn it to a CD.
<http://www.microsoft.com/DOWNLOADS/details.aspx?familyid=696DD665-9F76-4177-A811-39C26D3B3B34&displaylang=en>
2. Insert the CD into the Technician Computer's CD drive.
3. If the CD does not automatically launch, navigate to the CD drive and double-click **start_cd.exe**.
4. In the welcome screen, click **Windows AIK setup** to install the Windows AIK.
5. Follow the installer's prompts to install the Windows AIK with default values (or desired options).



NOTE

In the document's example, the default values were used for the Windows AIK installation.

Ensure ConfigMgr is Configured for User State Storage

1. In the left-hand navigation pane of ConfigMgr, expand **System Center Config Mgr -> Site Database -> Site Management -> <your site> -> Site Settings -> Site Systems -> <config manager server to host User State Storage>**.
2. If **ConfigMgr state migration point** is listed, this server is already configured. If not, complete the following steps.
3. Right-click on the server, then choose **New Roles** from the menu.
4. Click **Next**.
5. Select the box labeled **State Migration Point** and click **Next**.
6. Click the **New Criteria** button.
7. Enter a path (for the document example we use c:\userdata.c:\).
8. Click **OK**.
9. Click **Next**.
10. Click **Next** again.
11. Click **Close**.

Hashing Problems Can Cause Files to Not Replicate Properly

If you receive the error 0x80091007 while testing the advertisement, this indicates that the files are not replicating properly. The error is due to the hash value not being correct.

To fix this problem, you need to change the advertisement to run from the server instead of downloading first and then running. To change this setting, update the distribution point for the package, or choose **Access content directly from a distribution point when needed by the running task sequence** in the Distribution Points screen of the Advertisement Properties wizard (see section 4.2, step 18).

6 Appendix B: Alternative Method for Joining the Managed Client to the Console Domain

When creating the package, you must supply the username and password that will have administrative rights to Active Directory in order to join the managed client to the console's domain and create the computer account in Active Directory. In addition, the managed client must be joined to the same domain as the management console. There are several ways to rename and join the managed client to the management console's domain. The instructions in Section 3.3.1 use the ConfigMgr deployment tool to rename and join the managed client to the domain (specifically step 5 in that section). This appendix presents an alternative method to ConfigMgr's deployment tool.

That alternative method is to run an application that will rename the managed client to the domain, reboot it, then join the managed client the domain. The difference between this method and using the ConfigMgr Deployment tool is that this alternate method has the user account and password encrypted within an executable. By using the secure and embedded application described below, you can join the managed client to the console domain without having to know the username and password to the managed client's administrative account when the package is created.



NOTE

There are many algorithms available today that allow you to embed a string. The method shown below is only a recommendation. Other methods may work just as well. The code can be written in any language. The example below is written in VB.Net 2008.

Step One: Encryption

The first step is to use the Encryption Function to first encrypt the string by stripping each letter, changing it into its corresponding ASCII integer based on the ASCII table, then XOR it against some number. The number used in the example is 150.

The reason for using this encryption algorithm is that any EXE can be opened in a text editor like Notepad and string literals can be pulled from the code. If the password is written in clear text and stored into a string variable, it can be opened and removed, thus making the EXE unsecure.

When running the encryption function, run it once with the string literal, then write down the array of numbers. Type in the array of numbers into the PWD variable, and remove the encryption string. When the executable is opened in a text editor, the text editor will read all lines as numbers and characters and without knowing the XOR number or how the value has been encrypted or casted. Therefore, the person viewing

the file will not be able to decode the array of numbers to determine the actual password. This keeps the password safe and the code reusable if the administrators are not the ones creating the deployment package.

For example, if you call `Encrypt_String("HelloWorld1")` and encode the string with XOR 150 as below, the array of integers should be:

222,243,250,250,249,193,249,228,250,242,167.

Example of Step One:

```
Private Function Encrypt_String(ByVal StrToEncrypt As String) As Array
    Dim index As Integer
    Dim strLetterHolder As String
    Dim strArrayHolder(StrToEncrypt.Length - 1)

    For index = 0 To StrToEncrypt.Length - 1
        strLetterHolder = StrToEncrypt.Substring(index, 1)
        strArrayHolder(index) = Asc(strLetterHolder) Xor 150
    Next

    Encrypt_String = strArrayHolder
End Function
```


Step Two: Decryption

The second step includes adding the Decryption function to pass in the array of numbers that represent the encrypted string and store that in the code as a parameter. The example uses this PWD later in the code to do the renaming and the joining of the domain. Once you have determined what your decryption value is (the example shows it as XOR 150), you can decrypt the array of integers to determine the letter against the ASCII table as seen in our example below.

Example of Step Two:

```
Private Function Decrypt_String(ByVal StrToDecrypt() As Integer) As String
    Dim index As Integer
    Dim strHolder As String

    strHolder = ""
    For index = 0 To (StrToDecrypt.Length - 1)
        strHolder = strHolder & Chr(StrToDecrypt(index) Xor 150)
    Next

    Decrypt_String = strHolder
End Function
```

Step Three: Renaming the Managed Client

The third step is the actual renaming of the managed client. There are many ways to rename the managed client to the domain. The simplest way is to use the renamemachine.exe utility that comes with the Windows XP Reference Kit. The renamemachine.exe utility will work on a variety of different OS's and is simple to use. Programmers can also use API calls to rename the machine.

Step Four: Joining the Managed Client to the Domain

The fourth step is to join the system to the domain. This can be done in a variety of ways. The example below uses Windows Management Instrumentation (WMI). In order to join the system to the domain, the code must determine the computer name of the managed client. Since the managed client should have been renamed and then

rebooted before being joined to the domain, we can easily get this value either from the registry or by using WMI.

The `csname` is the computer name variable that can be searched within WMI under the `Win32_OperatingSystem` class. Once the computer name is obtained, you can connect to the managed client to join it to the domain.

A connection is named to the managed client under `Win32_ComputerSystem`. Then `JoinDomainOrWorkgroup` is called, passing the following parameters:

- **AccountOU**, which is NULL. You can set this to the direct path of where you would like to join. In our example we have set this to NULL.
- **FJoinOptions**, which is set to 1. There are a variety of settings that can be used for `FJoinOptions`. 1 is to join the system to the domain.
- **Name**, which is the computer name we are joining. This should have been gotten from the query under the `Win32_OperatingSystem`.
- **Password**, which was decrypted from the array of integers above with the decryption function.
- **UserName**, which is the username that corresponds to the password. You can either also encrypt this and decrypt it or use it as a string literal. It depends on how much you want a violator to see when they try to open up your executable.

Once you have the parameters in place you can invoke the method which executes the joining of the domain. Verify the return value to see if the execution has completed.



NOTE

Success will show a return value of 0. If the managed client has already joined the domain, the return value will be 2691.

Useful Links for Code in Step Four

Link to options in `JoinDomainOrWorkgroup`:

[http://msdn.microsoft.com/en-us/library/aa392154\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/aa392154(VS.85).aspx) or
<http://forums.msdn.microsoft.com/en-US/csharpgeneral/thread/5588e66a-8c11-4456-b078-0f4f791d4ebc/>

Link to WMI Code Creator:

<http://www.microsoft.com/downloads/details.aspx?familyid=2CC30A64-EA15-4661-8DA4-55BBC145C30E&displaylang=en>

Link to using Searcher to find `CSNAME`:

[http://msdn.microsoft.com/en-us/library/aa394239\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/aa394239(VS.85).aspx)

Example of Step Four:

```

Dim objOS As ManagementObjectSearcher
Dim strComputerName As String
Dim ARRAY_PWD() As Integer
Dim PWD As String

strComputerName = ""
PWD = ""

'Encrypt your string
If UCase(ENCRYPT) = "YES" Then
    'After you run this function with YES - then save the array of
    numbers and type in below
    ARRAY_PWD = Encrypt_String("")
Else
    ARRAY_PWD = New Integer() {222,243,
250,250,249,193,249,228,250,242,167}
End If

'Decrypt and output your string
If UCase(ENCRYPT) = "NO" Then
    PWD = Decrypt_String(ARRAY_PWD)
End If

objOS = New ManagementObjectSearcher("SELECT * FROM
Win32_OperatingSystem")
For Each objMgmt In objOS.Get
    strComputerName = objMgmt("csname").ToString()
Next
Try

Dim classInstance As New ManagementObject( _
    "root\CIMV2", _
    "Win32_ComputerSystem.Name='" & strComputerName & "'", _
    Nothing)

```

```

' Obtain [in] parameters for the method
Dim inParams As ManagementBaseObject = _
    classInstance.GetMethodParameters("JoinDomainOrWorkgroup")

' Add the input parameters.
inParams("AccountOU") = "NULL"
inParams("FJoinOptions") = 1
inParams("Name") = "vprodemo.com"
inParams("Password") = PWD
inParams("UserName") = "vprodemo\itproadmin"

' Execute the method and obtain the return values.
Dim outParams As ManagementBaseObject = _
    classInstance.InvokeMethod("JoinDomainOrWorkgroup", inParams,
Nothing)

' List outParams
Console.WriteLine("Out parameters:")
Console.WriteLine("ReturnValue: {0}", outParams("ReturnValue"))
' MessageBox.Show(CStr(outParams("ReturnValue")))

Catch err As ManagementException

' Note: This command line should be uncommented to run in the
administrative context during debug. Debug on a client by Right Click this EXE
and run as administrator. Then you can see what the return value is. Note: When
running in SCCM as an advertisement, it will run in the administrative context so
this MessageBox will not show if its in the code.

    MessageBox.Show("An error occurred while trying to execute the WMI
method: " & err.Message)

End Try

'Exit From Form Load
Call ExitProcess(0)

End Sub

```

**NOTE**

The executable must be run within ConfigMgr in order to be in the administrator context. If it is run from the command line, even if you are logged in as administrator, it will run in the user context and will return an access denied error code of 5.