Surface

Surface Pro 3

Deployment and Administration Guide

Published: December 2014

Version 1.0

Microsoft

This document is provided “as-is.” Information in this document, including URL and other Internet website references, may change without notice.

Contents

PART I – DEPLOYMENT OVERVIEW

PART II – DEPLOYMENT STEP-BY-STEP

PART III – ADMINISTRATION

PART IV – APPENDIX

PART I

DEPLOYMENT OVERVIEW

Chapter 1 – Overview

Purpose of This Guide

This guide was constructed to show you best practices for deploying Windows to Surface Pro 3 devices. This may sound like a simple enough statement, but due to the vast number of scenarios and concepts, deployment can be quite complex. This guide is organized in a way that minimizes the learning curve for you to understand how to deploy Windows to the Surface Pro 3 devices to your organization. It presents step-by-step procedures that provide essential building blocks for successive chapters. Therefore, it is a good idea to read the chapters in order.

The deployment concepts discussed in this guide are valid for all Windows computers, but specifically targets scenarios for Surface Pro 3 devices.

You'll see many screenshots in this document, but in an effort to keep the document as short as possible, some images for basic options are described, but not shown.

Audience

This guide is intended for IT Professionals (IT Pros) that are responsible for managing and conducting rollouts of Windows devices within an organization. This guide is written specifically to account for scenarios that are typically experienced by organizations of all sizes, since many of the deployment concepts are not specific to organization size. However, there are some scenarios, tips, and other guidance that is likely to be experienced specifically by a small or medium business (SMB), or by a large business (enterprise). When the guidance differs by organization size, this is specifically called out in this guide. This guide does not assume specific software is available only to a specific size organization. For example, it does not assume only a large enterprise uses System Center.

If you have deployed Windows using a 3rd-party tool (a.k.a non-Microsoft tool), this guide provides a comprehensive introduction into best practices for deploying Windows to Microsoft Surface Pro 3 devices. As you'll learn, the best practice for deployments of all sizes is to use the free Microsoft Deployment Toolkit (MDT). New users and experience deployment professionals alike will gain insights from reading this guide. The Microsoft Deployment Toolkit is explored in more detail in the Microsoft Deployment Toolkit section of Chapter 2 and is featured throughout the step-by-step guidance in Part II of this guide.

Although the Microsoft Deployment Toolkit is the primary technology used throughout this guide, it is used in conjunction with other Microsoft technologies as part of the overall solution. For example, in Chapter 6: Automated Deployment with SCCM, the Microsoft Deployment Toolkit is integrated with Microsoft System Center Configuration Management to leverage the functionality of both tools.

For administrators who are experienced with Windows deployment and the Microsoft Deployment Toolkit, specific information is provided that addresses many of the key tasks for Surface Pro 3 and Windows deployment. To help identify the locations where these concepts are discussed, a brief list has been provided here:

- **Application Deployment** – Chapter 5
- **Windows Updates** – Chapter 4, Chapter 5, and Chapter 6
- **Surface Pro 3 Firmware** – Chapter 5, Chapter 6, and Chapter 7

- **BitLocker Encryption** – Chapter 8
- **Asset Tagging** – Chapter 8
- **Network Boot** – Chapter 3, Chapter 4, Chapter 5, Chapter 6, and Chapter 8
- **Deployment Planning** – Chapter 2
- **Offline Deployment** – Chapter 5
- **System Tracking** – Chapter 8
- **Surface Pro 3 Features** – Chapter 7
- **Windows Store Apps** – Chapter 4
- **Surface Pro 3 Administration** – Chapter 7 and Chapter 8

How This Guide is Organized

This guide is organized in a series of parts and chapters that present increasingly complex concepts that build upon each other. Therefore, it is recommended to read this document in sequential order. Even if you are familiar with deployment concepts, there are some important tips you'll learn along the way.

This guide is organized as follows:

- PART I: DEPLOYMENT OVERVIEW
  - **Chapter 1: Overview** – This chapter.
  - **Chapter 2: Deployment Introduction** – Outlines basic concepts and terms needed as a prerequisite for performing the step-by-step walkthroughs shown in Part II. Experienced deployment professionals may be able to skip this chapter, but novice deployment professionals should read this chapter.
- PART II: DEPLOYMENT STEP-BY-STEP
  - **Chapter 3: Manual Deployment with MDT** - Provides a walkthrough of a basic, standalone deployment of the operating system. This is a manual deployment because it provides no automation, thereby forcing the user to enter required setup data throughout the process. The resulting operating system contains no applications or configuration, so these will need to be installed or configured on each computer.
  - **Chapter 4: Reference Deployment with MDT** – Builds upon the manual deployment scenario, but starts to introduce some automation. User interaction required during deployment is less than the manual deployment, but more than a fully automated deployment. This scenario is used to prepare a reference system and create an image for use in Chapter 5 and Chapter 6. Deployment of the image to a test computer is also covered, but this test computer contains no drivers or applications.
  - **Chapter 5: Automated Deployment with MDT**– Builds upon the reference deployment scenario with additional automation, requiring minimal user interaction during deployment. This scenario uses the image created in Chapter 4 and also deploys applications and drivers. The resulting operating system is ready for use when the deployment completes. This scenario also addresses both online deployment for network joined systems and offline deployment for systems without network connectivity.
  - **Chapter 6: Automated Deployment with SCCM** – Adds System Center Configuration Manager and support for zero-touch installation (ZTI) to produce an automated deployment requiring no interaction from the user. This scenario uses the image created in Chapter 4 and includes applications and drivers that are managed by System Center Configuration Manager. The resulting operating system is complete

with applications and drivers, is configured for central management through SCCM, and is ready for use by the end user.

- PART III: ADMINISTRATION
    - Chapter 7: Administration Overview – Describes Surface Pro 3 administration and concepts.
    - Chapter 8: Surface Pro 3 Administration Scenarios – Outlines Surface Pro 3 administration by showing how to manage these settings and features:
        - Asset Tagging
        - BitLocker Encryption
        - Pen Pairing
        - User Data Migration
        - System Tracking
- PART IV: APPENDIX

Document Conventions

The conventions used in this document are as follows:

- **Bold** text – Indicates a literal name of an object on a screen, such as a button, link, option, or menu.
- *Italicized* text – Indicates the first time a term is used.
- `Monospace` text – Indicates code or script that can be copied/pasted and used in your environment.
- **Ctrl**+**F** – Indicates the Ctrl and F keys are pressed simultaneously.
- **File**→**Save** – Indicates a series of menu clicks.
- **Note** – Indicates some additional information or considerations for a concept, option, or configuration.
- **Caution** – Indicates special warning or tip to consider that may adversely affect your computer.

What's Not in This Guide

This guide focuses on a variety of scenarios for Windows deployments. However, this guide assumes you already have knowledge of these specific areas of administration and IT:

- Windows Networking
- Windows Server
- Windows Firewall
- Hyper-V
- System Center Configuration Manager

Chapter 2 – Deployment Introduction

Deployment Concepts

This section discusses the concepts you'll need to gain an overall understanding of the deployment process for the Windows operating system and the tools available to your organization. Please read this section before continuing with the rest of this deployment guide.

Deployment and Imaging

The simplest way to transfer an operating system onto a single computer is known as installation. *Installation* simply refers to running a setup application supplied with the original media and following the prompts on the screen. For one computer (or a small number of computers), this can be an ideal way to upgrade a computer's operating system, or for single bare metal machines. The setup application prompts for basic information to be manually entered and once the default environment is prepared, the system can be manually customized with applications, drivers, and settings.

As the number of computers in your organization increases, it becomes less efficient (or even impossible) to install an operating system on all computers by using a setup application. It becomes essential to employ methods of installation that not only reduce the time and effort, but standardize the resulting systems. For more than one computer, you need an efficient process to distribute the operating system and configuration to each, a process known as *deployment*.

The simplest method of deploying to multiple computers is *cloning*, whereby the process of installation and configuration is performed on a single computer and the disk drive is mirrored to the other computers. This produces multiple identical computers. One key problem with this approach is that you need to physically remove the storage media, such as the hard drive(s), connect them to the system you are cloning, clone the drive, then reinstall the devices. Another is that the hardware configuration of the computers must be identical. Even minor variations in hardware can result in a computer that will not boot or function as intended.

These limitations are addressed by the process of *imaging*. Imaging works similar to cloning in that the target computer contains the source computer's files, but rather than directly transferring all files to the destination disk, the configuration of the source disk is stored as a data file. Because this file represents an exact copy of the source, it is known as an *image*. The image file can be transferred, or distributed, through a variety of means including removable media (USB hard drive), optical disks (DVD, BluRay, etc.), or over standard network connectivity.

The first step in an image-based deployment is configuring the computer that is used as the source environment for generating an image to be deployed. This source environment is often referred to as the *reference system*. Once the reference system is configured, it is stored as an image file through a process known as *capturing an image*. The process of capturing an image cannot be performed while files are in use, so before capturing can begin, you must boot the reference computer to an alternative operating system. The device that contains the alternative operating system is known as the *boot media*.

Note: The image created from the reference system is commonly known as the reference image or base image. This image serves as the core configuration on which the environment for every deployed computer is built.

Boot media can reside on removable storage (such as a USB stick or optical media), but can also be located on your network. If you use your network as boot media (also known as *PXE boot*), your computer's network card must support the *Preboot Execution Environment (PXE)* standard. The Surface Pro 3 supports PXE boot through the docking station or Surface Ethernet Adapter. Your reference computer is likely to boot to the hard disk first, so you often need to change the boot order in the system firmware to boot to the boot media containing the alternative operating system. Most computers, including Surface Pro 3, provide a boot menu that enables a device to be selected at startup. Details of how you select your boot media on Surface Pro 3 are shown in Chapter 3.

Once an image file is created, it is stored on local or network storage so that it can later be transferred, or *deployed*, to the destination computers. This step also involves the alternative operating system provided by boot media, but is effectively the reverse of a capture step, whereby the data in the image file is read and then written to the disk on the new computer.

Sysprep and Generalization

The result of both the imaging and cloning procedures is a set of virtually identical computers. While in many ways you want the destination computers to be identical to the reference computer, you don't want everything to be identical. For example, you don't want the same computer identification and possibly the license/product keys (depending on the type of license) on multiple computers.

The Windows operating system maintains an identifier which enables each Windows computer to appear as a unique and individual computer when connected to the network. This Security Identifier, or *SID*, if identical between two systems can produce conflicts with networking software. This is similar to the way you cannot have two computers with the same IP address on the same network. A notable example of software that conflicts with an environment with identical SIDs is Windows Server Update Services (WSUS).

Another scenario where a destination computer and reference computer differ is where there is a variation or change in the hardware configuration. This variation can be a small change, such as using a discrete graphics card rather than the onboard graphics card, or it can be two completely different models of computer where almost every device differs. Drivers from the reference computer could cause conflicts in the destination computer or even result in the computer being unable to boot.

Since a captured image will be identical to the reference system (including SID and licensing data), this data must be removed before it can be deployed. The solution is to use the *System Preparation Tool (Sysprep)*, which is a utility designed to assist with deployment and creation of images. Sysprep works in conjunction with Windows Setup to reset an existing Windows environment to a state in which this information can be regenerated for each new system to which the environment is deployed. This process is known as *Generalization*. When Sysprep runs, it removes the undesired configuration and information from the system, then reboots to a phase of Windows Setup known as *Windows Welcome* or the *Out of Box Experience (OOBE)*.

Note: If you don't run Sysprep, the system is not considered unique, and therefore is not compliant with Microsoft support policy.

The purpose of the OOBE is to present the user with the same welcome screen and prompts as he/she would experience during a typical Windows installation/setup. As expected, the OOBE experience prompts for basic information like computer name, workgroup or domain, and product key.

In some cases you want your users to experience OOBE. An example is those cases where the domain or workgroup of the deployed computers may vary, or where the product key will change for each computer and will require it to be entered manually. Another example is the pairing wizard for the Surface Pen for Surface Pro 3, which is covered in more detail in the Pen Pairing section of Chapter 8.

In other cases, many of the answers to question prompts are known in advance and are therefore predetermined. In these cases Windows Setup can be configured to supply these predetermined answers to avoid prompting the user. Answers to the setup questions are stored in an *Answer File*. In addition to supplying answers for the prompts which are presented by the OOBE experience, a wide variety of additional settings are available which instruct Windows Setup to perform additional tasks or to alter its behavior. A complete reference of the available settings for an answer file and Windows Setup is linked in the References section of the Appendix.

Image Servicing

Some 3rd-party imaging tools capture images by reading each sector of the storage media and creating an exact duplicate of the storage media. This type of image is referred to as a *sector-based image*. Sector-based images have two disadvantages: lack of granularity and poor serviceability.

When a sector-based image is applied to a system, it overwrites the configuration of the storage media that includes partitioning, file systems, etc. As such, it is impossible to apply only part of the image or to apply the image in a way that is non-destructive to the files that reside on the storage media.

As sector-based images lack the ability to distinguish between individual files within the image, they are also difficult to modify, or *service*, after creation. To explore the files within a sector-based image, a mounting solution is required that emulates a hardware device and presents the data to the operating system sector-by-sector. Due to this level of complexity required for sector-based images to access the files within an image, making modifications or alterations to the files within an image is often less efficient than deploying that image to a system, modifying it, then recapturing.

On the other hand, *file-based images*, such as those created in the Windows Imaging format (WIM), are not subject to the limitations of sector-based images. File-based images are captured at the file system level and thus are aware of the individual files within them. They can be thought of as a large ZIP or archive file in which all of the files for the environment are stored. They can be deployed to an existing file system without destruction of the data in that file system, which is beneficial for migration scenarios where preservation of user data is required.

File-based images can also be edited directly using tools for servicing the image. For example, an existing file-based image that is configured for a specific make and model of computer can have the drivers and files required for another computer *injected* or inserted into the image so that it can be deployed to a platform for which it was not originally intended. Another example is where Windows Updates can be applied to a Windows image to ensure that the deployed computer is fully up-to-date.

Table 2.1 outlines the benefits of the different types of image technologies.

Sector-Based Images	File-Based Images
• Not Serviceable • By drive • Destructive • Not Flexible	• Serviceable • By partition • Non-Destructive • Flexible

Table 2.1: Benefits of Imaging Technologies.

Licensing

An important consideration when deploying the Windows operating system is how licensing will be managed for the deployed devices. There are four standard solutions for the management of licenses and each has implications for the deployment process. These four solutions, described in the following sections, are:

- Single license key
- Multiple Activation Key (MAK)
- Key Management Service (KMS)
- Active Directory-Based Activation (ADBA)

Single License Key

Single license keys are available in several varieties, including Original Equipment Manufacturer (OEM), retail or Fully Packaged Product (FPP), and retail upgrade. In a deployment scenario where the devices are licensed through OEM or FPP channels, the license key will need to be manually entered on each computer individually to properly facilitate activation. Some computers can have operating system product keys embedded into the system firmware through OEM Activation 3.0 (OA 3.0). This includes the product key supplied with the Windows 8.1 Professional installation included with the Surface Pro 3. The order of precedence for product key activation is:

1. Answer file
2. OA 3.0 product key in the system firmware
3. Product key prompt

As such, in order to ensure the OA 3.0 key is used in a deployment to the Surface Pro 3, no answer key should be specified in an answer file or included in the image.

Multiple Activation Key (MAK)

For organizations with Volume Licensing agreements, there are three methods managing licenses. The first is Multiple Activation Key (MAK), which is a license key that can be used on more than one computer, though it must be activated on each. To deploy Windows with a MAK, include the key in the deployment task sequence or specify they key with the answer file. For more information about task sequences, see the Task Sequences section in this chapter.

Key Management Services (KMS)

Another method of managing volume licenses is Key Management Services (KMS). With KMS, an organization maintains a server that manages activation of the clients and communicates the activation data back to Microsoft. To deploy Windows using KMS, no key is required during deployment. Volume License versions of the Windows Client are pre-configured as KMS clients and will attempt to discover a KMS host if no other qualifying license is discovered.

Note: The deployment of images in organizations with Volume Licensing agreements for Windows 8.1 Professional is governed by the Reimaging Rights conferred with that Volume Licensing agreement. This agreement enables reimaging from volume license media to devices with preinstalled versions of the same product. For example, an organization with a pre-existing Windows 8.1 Professional image created from volume license media can deploy that image to the Surface Pro 3 licensed for Windows 8.1 Professional using the license for Windows 8.1 Professional (OEM) included with the system. These rights apply only to the same edition and version of Windows. For example, a Windows 8.1 Enterprise image cannot be used with a Windows 8.1 Professional license. It is recommended to use Volume License Media for deployment to Surface Pro 3.

Active Directory-Based Activation (ADBA)

Beginning with Windows 8, a new activation method was introduced that allows activation through an Active Directory domain. This method enables central activation and management of licensing without requiring the infrastructure necessary for KMS. Active Directory-Based Activation is managed through the Volume License Activation and Management Tool (VAMT), a component of the Windows Assessment and Deployment Kit (Windows ADK) covered in the Microsoft Tools section later in this chapter.

Deployment Types

A deployment can be categorized by the amount of interaction required of a user during the deployment process. The three types of deployment are:

- High-Touch Installation
- Lite-Touch Installation
- Zero-Touch Installation

It is possible to deploy using more than one deployment type. For example, to deploy to a new computer which is not configured for a management solution or internal network, some level of interaction is required to cause the system to initiate the deployment process, though the process of deployment could be entirely automated as a zero-touch deployment. Each deployment type is discussed in the following sections.

High-Touch Installation

High-touch deployments are characterized by a large degree of user interaction during deployment. A typical high-touch deployment requires the user to perform each separate task manually, often from the command-line. Usually drivers, applications, and customization are all performed manually by the user as well, often on each deployed system. High-touch deployments are rarely used in scenarios with multiple computers due to the inefficiency and time involved.

Note: A sub-category of high-touch deployment is *full-touch* installation, a term that is usually used to describe installation from the original installation media and manual installation of applications and drivers.

Lite-Touch Installation

Lite-touch installation (LTI) is a deployment strategy that requires a user to manage and monitor the deployment process, but eliminates many of the repetitive steps and processes, which increases the efficiency of the deployment. The user is often required to boot to the deployment media and to answer basic questions such as the name of the computer and to join a workgroup or domain, but the environment is pre-configured with applications and drivers which eliminates the need for separate installation or configuration. The deployment can be fully automated but still have to be manually initiated. The Microsoft Deployment Toolkit (MDT) is the recommended tool for LTI deployments. The scenarios covered in Chapter 3, Chapter 4, and Chapter 5 are all lite-touch deployments.

Zero-Touch Installation

In a zero-touch installation (ZTI) deployment there is no human interaction on the client computer. The deployment is performed entirely from the deployment server. Zero-touch deployments usually require a refresh or migration scenario, where the target computers can be instructed to initiate the deployment and utilizes a management solution like System Center Configuration Manager. Zero-touch deployment is covered in Chapter 6.

Deployment Tools

There are many factors to consider when selecting the deployment tools you will use in your organization. This section outlines those tools and helps you understand the factors and considerations to make the appropriate decision for your deployments.

Factors and Considerations

When selecting deployment tools and technologies for application in your organization and environment, there are several factors which bear consideration:

- Ease of use
- Serviceability
- Scalability
- Automation
- Compatibility
- Price

Ease of use

Ease of use must be seen from two perspectives: the experience of the user or team setting up the infrastructure and the individual or team doing the deployment.

Investing in some automation may initially take some time and require specialized skills, but will make device deployment easier, faster and more consistent in the long run for those actually doing the deployment.

Serviceability

Serviceability was briefly covered earlier in this chapter. Using a file-based imaging technology makes it possible to service the image, whereas sector-based technologies does not. Serviceability ensures the ability to modify an image to keep software updates current, as well as the ability to modify components such as drivers and applications to address new platforms and scenarios. Sector-based imaging by contrast often requires that an image be deployed to a reference machine, manually updated or modified, and then re-captured whenever updates or changes are required.

Scalability

Scalability refers to the ability to use your selected technologies for deployment as your organization grows or you rollout to larger parts of your company. A solution which supports network deployment is a must for scalability.

For larger deployments, there are additional scalability considerations, such as:

- Selecting technologies that maximize performance by minimizing network traffic
- Do the technologies cover multiple scenarios, such as:
    - Deployment to field or disconnected workers
    - Distribution across sites or subnets
    - Bring Your Own Device (BYOD) scenarios
    - Virtual Desktop Infrastructure (VDI) scenarios

Automation

Automation refers to the ability of a deployment task to be performed without human interaction. Some key considerations in determining the level of automation provided by a deployment tool are:

- Minimizing time and effort required to configure and deploy to your organization.
- Ability to reduce repetitive tasks, such as application installation, user data migration, etc.
- Ability to configure using graphical, on-screen wizards, instead of complex command-lines. The more complex and manual a process is, the more the possibility exists that errors will be introduced.

Compatibility

A key requirement of any deployment technology is the compatibility of the solution with the hardware and operating systems in your environment. For example, some deployment tools lack the ability to deploy to latest generation hardware due to changes in the way that storage and firmware are managed. For example, Surface Pro 3 is a UEFI 2.3.1 class 3 device, so many older technologies may not be compatible.

Price

The cost of a deployment solution is an important consideration. You may have some deployment solutions already implemented or licensed in your environment. For example, Windows Deployment Services is a feature included with Windows Server or you may have System Center Configuration Manager already implemented as a management solution. Some of the technologies discussed in this guide, such as Microsoft Deployment Toolkit and Windows Automated Deployment Kit are available at no charge.

Third Party Tools

This guide is written to highlight Microsoft technologies, but it is possible to use some third-party tools and technologies to deploy Surface Pro 3 devices. While this guide is unable to address specific third-party tools, there are two factors to consider:

1. Many third-party tools use sector-based imaging, which makes servicing and automation difficult or impossible.
2. Some third-party tools simply serve as a wrapper around Microsoft tools and technologies. These third-party tools may leverage boot media provided by Microsoft tools, or employ a mounting solution for servicing sector-based images, but use Microsoft technologies to do so.

Microsoft Tools

There are many deployment tools and technologies provided by Microsoft for Windows deployment. These tools provide a variety of solutions that range in complexity and functionality. Some tools are very specific utilities designed to perform only a single task, others are complete solutions that can perform every step of a deployment. Most of the tools can be integrated into a complete solution accessed through a single interface, providing a combination of functionality and ease of administration. More details about these tools and solutions are provided in the following sections.

Windows Deployment Services

Included with Windows Server, Windows Deployment Services (WDS) is a solution for the network distribution of images and boot media. WDS provides support for PXE booting which helps to eliminate the need for physical boot media when performing lite-touch deployments. It also natively supports the deployment of images in the file-based Windows Imaging Format (WIM), which is common to all modern Microsoft deployment solutions.

WDS supports management of drivers and the creation of images and can serve as a powerful deployment solution by itself, but works best when combined with the Microsoft Deployment Toolkit covered later in this chapter to provide additional capacity for automation and customization during the deployment process. The version of WDS included with Windows Server 2012 or newer is required for support of UEFI 2.3.1 devices like Surface Pro 3.

Note: For smaller environments without access to Windows Server, the cost of implementing Windows Server to use WDS may be prohibitive. However, Microsoft Deployment Toolkit (MDT) is available at no cost and will operate on a client computer. Even if you are using Windows Server, installing MDT on a client computer can reduce workload by enabling the deployment storage location to be hosted by a Windows client while still supporting the network boot capability of WDS. MDT is described in more detail later in this section.

Windows Assessment and Deployment Kit

The Windows Assessment and Deployment Kit (Windows ADK) is a collection of several tools and utilities that perform specific tasks required during different parts of a deployment. If you are familiar with the Windows Automated Installation Kit (Windows AIK), the Windows ADK is the replacement toolset for Windows 8 and newer operating systems. When downloading the Windows ADK, it is important to ensure that you are downloading the latest update because prior versions of the Windows ADK may not work on later operating systems. Most of this tools are command line only, and are used behind the scenes by other tools such as the Microsoft Deployment Toolkit (MDT).

Inside the Windows ADK there are several components, each described in subsequent sections:

- Windows System Image Manager (Windows SIM)
- Deployment Image and Servicing and Management (DISM)
- Windows Preinstallation Environment (WinPE)
- User State Migration Tool (USMT)
- Volume Activation Management Tool (VAMT)

Table 2.2 summarizes the purpose of each Windows ADK tool.

Tool/Technology	Purpose
Windows System Image Manager (Windows SIM)	Creates and verifies answer files
Deployment Image and Servicing and Management (DISM)	Services and modifies images and environments

Windows Preinstallation Environment (WinPE)	Alternate boot operating system used to perform deployments and imaging
User State Migration Tool (USMT)	Migrates user data from one environment to another
Volume Activation Management Tool (VAMT)	Centrally manages Microsoft licenses and activation
Application Compatibility Toolkit (ACT)	Mitigates application incompatibilities

Table 2.2: Windows ADK Tools.

Note: The Application Compatibility Toolkit is a powerful tool used to provide compatibility fixes, or shims, to resolve application compatibility issues. Although it is included in the Windows ADK, it is not covered in this guide.

The Windows Assessment and Deployment Kit can be downloaded from the Microsoft Download Center by following this link:

http://go.microsoft.com/fwlink/?LinkId=293840

Windows System Image Manager

The Windows System Image Manager (Windows SIM) is the utility that creates and manages the answer files used with Sysprep and Windows Setup. Answer files are stored in an XML format, so it is possible to manually edit these files. However, using WISM to manage answer files ensures the resulting file is built from settings confirmed to be valid for the target operating system. Using the Windows SIM helps to ward against human error when performing a deployment with configurations set by the answer file.

Deployment Image Servicing and Management

The Deployment Image Servicing and Management tool (DISM) is one of the most important tools included with the Windows ADK. It is used to mount and service Windows images and replaces the previous imaging solution called ImageX. ImageX was used by the Windows AIK in Windows 7 and Windows Vista. DISM is a command-line utility that supports file and package management in images and can be used to apply updates, drivers, apps, and other configurations to an image. DISM has the ability to service an operating system environment while it is currently running on a computer, or an offline image.

Even with third party tools where servicing is supported, management of a Windows image is typically performed with DISM. DISM is also commonly used in system maintenance and repair. In Windows 8 and later versions of Windows, the DISM utility replaces the deprecated System File Checker (SFC) to verify and repair Windows core operating system files. DISM is also commonly used to add or remove Windows features.

Windows Preinstallation Environment

The Windows Preinstallation Environment (WinPE) is the alternative operating system executed on the boot media used by Windows Deployment Services, the Microsoft Deployment Toolkit, System Center Configuration Manager, and several third party deployment solutions. As a minimalistic environment based on the kernel of the Windows operating system, WinPE supports the same drivers and many of the same commands as the operating system being deployed. This ensures compatibility with the destination computers and provides a highly configurable environment which is able to meet a wide variety of tasks. Windows PE is runs exclusively from RAM to make sure no files are locked in the disk to which we are deploying a new Operating System.

User State Migration Tool

The User State Migration Tool (USMT) is a command line utility that is used to back up and restore user-specific data and settings. USMT includes two processes, **ScanState** and **LoadState**. **ScanState** is used to backup user settings, either to the network, an external device, or locally on the system in a way that will be preserved through a file-based image deployment using Microsoft tools. **LoadState** is then used in the deployed operating system to restore the user data and settings for a seamless transition to the new computer.

Volume Activation Management Tool

The Volume Activation Management Tool (VAMT) collects activation data for large deployments by serving as a central relay for communication with the Windows activation servers. It also provides a secure central management solution for product keys and inventory and monitoring services for licensing and activation. VAMT also facilitates management of licensing through Active Directory-Based Activation (ADBA).

System Center Configuration Manager

One of the most feature-rich solutions for the deployment and management of computers within an organization is Microsoft System Center Configuration Manager, also known as SCCM. This enterprise tool serves not only as a utility for facilitating operating system deployment, but also for managing active systems across an enterprise. SCCM enables the deployment of applications, management of updates, and complex reporting of the environment. SCCM is capable of managing not only Windows computers, but also those running non-Microsoft operating systems and mobile devices.

SCCM enables package and update management, so not only can a new environment be pushed to client computers such as Surface Pro 3, but also driver and firmware updates. See Chapter 6 for more information about driver and firmware deployment for Surface Pro 3 scenarios.

SCCM also supports a fully-automated, zero-touch deployment scenario. As a management solution, it is able to seamlessly initiate deployment in a refresh scenario and perform the distribution of the environment without any user interaction. SCCM integrates with the Microsoft Deployment Toolkit integration (see next section for more information), to enable even more functionality, such as support for User Driven Installation (UDI). *UDI* is a framework that enables an IT department to create a custom deployment wizard to guide users through a specific installation or customization task.

Microsoft Deployment Toolkit

Each of the tools and technologies discussed thus far enable some deployment functionality, but the Microsoft Deployment Toolkit (MDT) pulls all those technologies together, acting as a wrapper to consolidate the configuration and unify the deployment experience.

Note: Early versions of the Microsoft Deployment Toolkit were known as Business Desktop Deployment, or BDD.

The Microsoft Deployment Toolkit is a highly scalable deployment solution. It can be used in deployments for small and medium sized businesses (SMB), or large enterprises alike. MDT can handle small deployments where no servers are available and the deployment files are hosted on a user’s workstation. Likewise, MDT can be used for distributed deployments to multiple sites and thousands of computers across data centers, networks, and domains.

MDT is also highly automated, with an extensive set of preconfigured scripts and a process for scripting each step of a deployment through *task sequences*. Task sequences are series of steps, where each step is performed by a command or script that advances the deployment process. It even lends this automation to the serviceability of the images it manages. It automates the management of drivers, applications, and packages to regulate updates and changes to the image for the easiest maintenance of images and the greatest adaptability to new requirements and situations.

Note: Regardless of your business size or scenario, MDT is the recommended solution for Windows deployment. If your organization uses SCCM or WDS, MDT can be easily integrated without interfering with existing configurations to provide the additional functionality and automation. For organizations already using SCCM as a management and deployment solution, MDT extends the deployment functionality by providing wizards, scripts, templates, and a customizable User Driven Installation (UDI) solution. For environments with WDS, MDT adds the ability to automate image creation and servicing, management of applications during deployment, and greatly reduces the amount of manual labor required to perform simple and regular imaging tasks.

Table 2.3 represents the factors for each of the Microsoft deployment solutions and the ranking within each on a scale of 1 to 5.

Tool/Technology	Serviceability	Scalability	Automation	Compatibility	Price
WDS	❶❷❸④⑤	❶❷❸❹⑤	❶❷③④⑤	❶❷❸❹⑤	Included with Windows Server
Windows ADK	❶❷❸④⑤	❶②③④⑤	❶②③④⑤	❶❷❸❹⑤	No cost
SCCM	❶❷❸❹❺	❶❷❸❹❺	❶❷❸❹❺	❶❷❸❹❺	May have additional cost
MDT	❶❷❸❹❺	❶❷❸❹❺	❶❷❸❹⑤	❶❷❸❹❺	No cost
Explanation	SCCM and MDT offer the greatest serviceability	SCCM and MDT offer the greatest scalability	SCCM and MDT offer the greatest automation	SCCM and MDT offer the greatest compatibility	MDT and Windows ADK are available at no cost.

Table 2.3: Comparison of Microsoft Deployment Solutions.

Microsoft Deployment Toolkit

As you learned in the Deployment Tools section earlier in this chapter, the recommended solution for Windows deployment for any size organization is the Microsoft Deployment Toolkit (MDT). With its capacity for scalability, MDT is the right tool for the job because it enables you to manage a single image for multiple configurations of hardware and software. Therefore, it is capable of meeting the requirements of any type of deployment. This section gives an overview of the components in MDT and the concepts you'll need to understand before taking a hands-on tour of MDT in Chapter 3.

The Deployment Workbench

The main user interface in MDT is known as the *Deployment Workbench*. The Deployment Workbench is presented as a snap-in for Microsoft Management Console (MMC). MMC is a familiar interface that IT Pros are likely to be familiar with, as it is used for other often used tools, such as Disk Management, Services, Event Viewer, and more.

Caution: The first item under the Deployment Workbench is the Information Center, where you will find the documentation for MDT, a getting started guide, and a list of components. It is not recommended to update MDT from the list of components because the incorrect version of the components may be installed. To ensure the latest tools are available to MDT, ensure that the latest version of the Windows ADK is installed.

Deployment Shares

A *deployment share* is a collection of the major components of MDT which are configured together as a collective unit. It can contain images, applications, drivers, task sequences, boot media, configuration files, and any other deployment component required. A deployment share is essentially a network share in which these components are located. It is hosted as a standard network share and secured through the same permissions and settings as any other folder shared on the network.

After having installed MDT and opening the Deployment Workbench, the Deployment Shares section will be empty, so you'll need to connect to an existing deployment share or create a new deployment share. When creating a deployment share there are several considerations, as follows:

- Isolation
- Scope
- Performance
- Security

Note: It is important to remember that it is possible to have more than one deployment share, and in many cases it is ideal to have at least two for the reasons outlined in this section. The number of deployment shares that are used in any given environment can vary, but it is common to have more than one.

Isolation

One of the most important reasons to have more than one deployment share is isolation. There are two primary reasons to isolate one deployment share from another:

- The two deployment shares utilize different, incompatible configurations.
- Scenarios where deployment shares require different security and permissions.

One common scenario that reflects the need for multiple deployment shares is when one deployment share is configured for a laboratory or testing environment. This deployment share is configured with permissions that permit full access to IT pros and does not contain organizational information such as instructions for the joining of the domain. It is used to prepare base images, test deployment configurations, settings, and applications, and to develop solutions which can be deployed to production deployment shares. Production shares are used to deploy images that are configured to join the domain, permissions are much more restricted, and the deployment solutions may be more automated.

Scope

An important question to ask when considering the number and purpose of separate deployment shares is what those shares are intended to address. In some cases, the scope of a deployment project may be all-encompassing, so the deployment share must be capable of deploying to an entire organization. In other cases, deployment shares may be only a limited deployment desired for a handful of users or a new set of hardware.

Consider the scenario where a fully developed and implemented solution is available for deploying notebooks and desktops in the organization, but where a handful of Surface Pro 3 devices are being purchased for select users. With these new devices comes the need to ensure that as they reach end users they are configured with select settings required in the organization, but which reflect the new device capabilities, such as touch and Windows 8.1. In this case, you may need to develop a deployment share specific to this new task and initiative.

If you create a new deployment share, you don't necessarily need to create new images and configure the deployment from scratch. If you already have images, applications, driver packs, and packages configured, a new deployment share can use those by either copying or linking. This prevents needing to recreate the wheel for your deployments.

It would also be possible to copy the all-encompassing corporate share to a separate server and configured as a new deployment share in which the images, applications, and any other components can be edited, modified, or even removed without disturbing the production share. In this way, an existing corporate image can be quickly modified to apply to new systems without affecting a critical production share.

Performance

In large enterprises, the performance of deployment is a crucial consideration. A deployment share improperly located or configured can result in extended downtime which can translate to work stoppage or loss of productivity. As deployment shares operate over the network, the same performance factors which affect standard file sharing and network communication also apply to deployments through MDT. The same solutions also apply.

For example, in a data center environment for Virtual Desktop Infrastructure (VDI), high performance network connectivity is common to meet the highly demanding nature of the systems in the environment. It would make logical sense in this scenario to ensure that the Deployment Share for those virtual environments was located in the data center for optimum performance. However, even if you have a data center deployment share, it may be better to create a separate deployment share for computers that are in another building or location. The bottom line is that you need to consider the performance of your network in relation to the location of the deployment shares.

Note: Some VDI solutions, such as System Center Virtual Machine Manager, include the ability to manage the creation or replacement of virtual machines.

There may also be scenarios in which offline media is the ideal solution, as MDT is fully capable of generating USB or optical media for physical distribution. Workers who operate remotely from home or contract workers who travel from site-to-site are two examples of where this might apply. Deployment with offline media is covered in the step-by-step process in Chapter 5.

Security

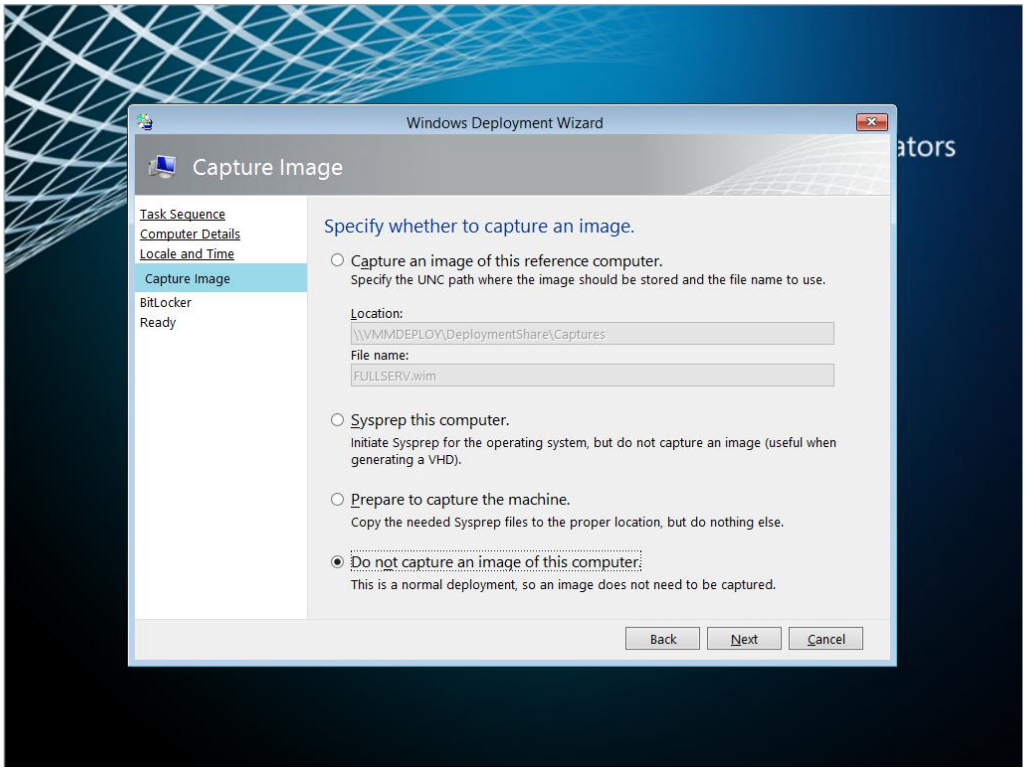
As mentioned before when discussing isolation, security is another important facet in determining how deployment shares should be configured. Beyond the simple concept of a fully open deployment share for system administrators working on the deployment project and another for production users with fully configured security, there are also scenarios where multiple shares can be utilized to provide granular security for targeted deployments.

For example, an organization could operate a deployment share which is available full time to one select set of users who might have the need to refresh their systems at will, but only a limited configuration for deployment is available.

Another deployment share could be used to provide a full-featured deployment across the organization, but is secured so that it is only available to the IT department. Even a third share could be configured with another select deployment configuration and made available only to select groups or users to help facilitate a staggered deployment.

Windows Deployment Wizard

The *Windows Deployment Wizard,* also known as simply the deployment wizard, is the user interface through which MDT is presented on client or target systems. It can be launched directly through network access to the deployment share or it is the interface presented when launching MDT boot media. The deployment wizard is used to select between task sequences to run on the client system and to provide any user interaction that wasn't automated to complete the deployment process. For example, the deployment wizard can request a computer name or to select between time zones. It can also prompt whether to generate a backup of the computer before deploying the new operating system and whether to encrypt the environment during deployment. An example of a deployment wizard prompt is shown in Figure 2.1.



Windows Deployment Wizard

Capture Image

Specify whether to capture an image.

○ Capture an image of this reference computer.
Specify the UNC path where the image should be stored and the file name to use.

Location: \\VMMDEPLOY\DeploymentShare\Captures

File name: FULLSERV.wim

○ Sysprep this computer.
Initiate Sysprep for the operating system, but do not capture an image (useful when generating a VHD).

○ Prepare to capture the machine.
Copy the needed Sysprep files to the proper location, but do nothing else.

● Do not capture an image of this computer.
This is a normal deployment, so an image does not need to be captured.

Figure 2.1. Windows Deployment Wizard Showing Prompt.

The experience provided by the deployment wizard is controlled by a selected task sequence and a configuration file, named **customsettings.ini**. **Customsettings.ini** contains settings for technician prompts and supplied answers. For example, automating the process of joining to a domain during deployment can be configured in **customsettings.ini**. Editing and configuring the **customsettings.ini** file is shown in Chapter 4 and Chapter 5.

Connectivity to the deployment share is secured by Windows credentials to the network share. When the deployment wizard launches, it will prompt the technician for user credentials each time it is run. However, it is possible to prevent being prompted each time by storing credentials in a configuration file, named **bootstrap.ini**.

Driver Management

As the Microsoft Deployment Toolkit is able to manage drivers independently of the operating system image, there is a separate section for Drivers in each deployment share. In some scenarios, like a share designed only to deploy to one make and model of computer, you can simply place the available drivers in this section and MDT will automatically select the most up to date applicable drivers for use at the time of deployment.

Note: It is not recommended to leave the drivers section of the deployment share unorganized. Even for a single make and model of computer, different drivers may be required for different environments, such as Windows PE and Windows 8.1. It is always recommended to organize drivers by make/model and operating system.

A deployment share might be used to deploy to many makes and models of computers, or the drivers for a make and model might have incompatibilities with the boot environment. It is recommended to organize your drivers into folders, based on make/model of computer, then by operating system. Within the **Drivers** section of the deployment workbench folders can be created in which to organize the available drivers and *Selection Profiles* can be created that target these folders under certain conditions, such as the use of a specific Task Sequence or when certain variables are met.

Selection Profiles are governed by simple configuration files in which a set of components can be selected and identified. Through them the process of selecting application sets, driver sets, and packages can be greatly simplified and automated.

For more details about downloading and configuring Surface Pro 3 drivers and firmware, see Chapter 3 and Chapter 6.

Application Management

Similar to the way drivers are managed, MDT can manage the deployment of applications separate from the operating system image. In order to allow MDT to manage an application, the installation files must first be brought into the deployment share by selecting New Application and specifying the installation files and the commands which apply to the installer. It is also possible to deploy files which are located outside the deployment share, such as if an application installer repository already exists on the network. This is covered in more detail in the Importing Applications section of Chapter 5.

As outlined in the Considerations for Images section later in this chapter, it is highly recommended to allow MDT to manage as many applications as possible. The reference image should contain only the applications that will never change because they cannot be easily altered after the image is created. For example, you would not build an image with the latest version of Adobe Flash or Oracle Java required for browsing an internal site, because when deploying to another set of computers in the future, you may discover newer versions of those frameworks have become available. When the applications are managed by MDT, you can simply add the updated applications and remove the outdated ones to ensure the latest versions are deployed.

MDT also supports post-deployment only task sequences that facilitate application deployment and operating system configuration. Through these task sequences, the operating system is not re-deployed, but applications can be installed on systems which did not originally receive them. MDT is not a full-fledged application deployment solution as it does not provide management of the deployed systems or applications. For that you would need to implement System Center Configuration Manager. With that said, MDT does support applications to be installed in a base image. Whether this type of configuration is in the best interest of your environment is dependent on the applications in your organization.

Note: MDT provides full support for the management and sideloading of Windows Store apps (APPX). *Sideloading* is the process of installing modern apps without downloading from the Windows Store. Chapter 4 shows how to manage Windows Store apps with your Windows deployments.

Package Management

Note: The MDT deployment share package management section is, perhaps surprisingly, not provided for management of application packages. Application management is performed by the applications section of the deployment share.

The package management section of a deployment share is provided for management of files provided in the Windows Update Standalone Installer format, .MSU. This can include Windows Updates, language packs, and features such as Remote Server Administration Tools (RSAT) or Internet Explorer. For management of Windows Updates, there are four potential solutions:

1. Windows Update
2. Windows Server Update Service (WSUS)
3. MDT package management
4. Up-to-date images

The least complex method for update management is to allow updates to be provided directly through Windows Update to each computer. This ensures that each environment will receive the full set of applicable updates and management of the process is not required. Though the management effort is reduced when using Windows Update directly on the client computer, the update traffic for each computer is separate and can tax internet connectivity. Downloading updates at the end of the deployment will also increase the deployment time and may require several reboots.

Windows Server Update Services (WSUS) is a feature of Windows Server that provides central management for updates in your organization. This method is recommended in most environments as it provides benefit not only for computers during deployment, but ongoing maintenance. The default deployment process through MDT includes steps that will ensure that updates are applied. Although WSUS aggregates Windows Update traffic on the local network, each computer will still seek to individually communicate with the WSUS server, which does increase demand on the network.

An alternative is to use the package management functionality supplied by MDT to inject the updates into the reference image at the time of deployment. This includes the update packages in the image when it is transferred to the target computer(s) and therefore reduces network traffic. Upon booting of the image the offline injected packages are processed and installed.

The enhance performance, you may want to avoid the installation of offline packages. Instead, the updates can be installed and incorporated into the image by allowing the update process to run and then capturing the image along with updates. This avoids the installation process for each update package, eliminating the time required to run each installation, and reduces network traffic by eliminating duplicate files.

MDT can also be used to manage packages that contain features or packs. Through the selection profile functionality available in MDT, these packages can be targeted to specific computers. An example usage would be to deploy Remote Server Administration Tools (RSAT) for system administrators.

Task Sequences

One of the key mechanisms by which actions are performed by MDT are task sequences. *Task sequences* are a series of steps that together comprise the actions performed in a deployment and the conditions that control which steps are performed. MDT provides nine out-of-the-box task sequence templates to get you started with task sequences. They are:

- **Sysprep and Capture** – Task sequences created by this template begins with a reference system, prepares it for deployment, captures an image, and writes it to the deployment share.
- **Standard Client Task Sequence** – This template creates a task sequence that includes the default steps for deploying a Windows client operating system to a new computer or system.
- **Standard Client Replace Task Sequence** – Task sequences generated from this template are for preparing an existing operating system for replacement.
- **Custom Task Sequence** – This template is used to generate a blank task sequence that can be customized.
- **Litetouch OEM Task Sequence** – This template is used by system manufacturers to place an operating system on a computer for distribution to customers.
- **Standard Server Task Sequence** – This template is used to create a task sequence for deploying Windows Server.
- **Post OS Installation Task Sequence** – Task sequences created from this template can be used to performing any required task after the operating system is installed. For example, task sequences created from this template can be used to install applications from the deployment share to an already existing Windows environment.
- **Deploy to VHD Client Task Sequence** – Task sequences created from this template can be used to deploy a Windows client to a computer using boot to VHD.
- **Deploy to VHD Server Task Sequence** – Task sequences created from this template can be used to deploy a Windows Server to a computer using boot to VHD.

Task sequences provide pre-configured processes for deployment tasks that can be controlled or run from the deployment wizard. They can be configured to be manual (allowing the technician to control the process through the supplied prompts and choices), or automated (where the answers to prompts or choices are pre-selected in the task sequence). Task sequences enable the deployment wizard to be configured to prompt the technician for only the essential information, thereby minimizing effort.

Task sequences are often configured to address specific goals or scenarios required during deployment. Here are some examples that show how separate task sequences can be created for each department to address the requirements of that department specifically. The examples below illustrate how it is possible to control the deployment wizard through task sequences to present only preselected options during deployment. Task sequences are shown in more detail in Chapter 3, Chapter 4, and Chapter 5.

- Financial Department Task Sequence
  - **Image:** Windows 7 Enterprise, required for compatibility with a custom developed application

    - **Applications:** A pre-selected set of applications including Office, accounting software, and the custom developed application
    - **Drivers:** Drivers are provided for multiple makes/models
    - **BitLocker:** Encryption enabled during deployment and enforced by group policy
- Design Department Task Sequence
    - **Image:** Windows 8.1 Update Enterprise
    - **Applications:** A choice of available applications including Office and various options for graphics software
    - **Drivers:** Drivers are provided for multiple makes/models
    - **BitLocker:** Encryption is optional during this task sequence
- Sales Department Task Sequence (Surface Pro 3)
    - **Image:** Windows 8.1 Update Enterprise
    - **Applications:** A pre-selected set of applications including Office
    - **Drives:** A selection profile in which only Surface Pro 3 drivers are available to avoid conflict
    - **BitLocker:** Encryption enabled during deployment

Considerations for Images

Creation of the images for use in your deployment environment is one of the most critical tasks for a successful deployment. The configuration of the base image will apply to every machine on which it is deployed. This section discusses best practices for image creation.

The Single Image Goal

In the traditional industry-standard approach for imaging technologies was to create one image for each combination of hardware and software. Even for a single computer make/model in an organization, this can result in a dozen or more images for each possible combination of software. For a dozen computer makes/models, the number of images can climb to well over one hundred. As the number of images increases, so too does the demand on the administrators who manage those images and the infrastructure on which the images reside.

In response to these increasing demands, a solution to increase the efficiency of image management and to help reduce the duplication of tasks was needed. The solution was file-based imaging. Through file-based imaging, a single image can be produced that can be modified to fit multiple scenarios or requirements. For example, for a single computer make/model, a single image can be used with offline servicing and automated application installation to eliminate the need for separate images for each combination of software.

With a deployment solution also supporting automated management of drivers, the need for multiple images can be reduced even further. In an ideal scenario, the use of automated management for applications and drivers can allow an entire organization with varied hardware makes/models and installed applications to be served by a single image. This ideal scenario is commonly known as the *single image goal*.

Note: This automated management of applications and drivers is provided by the Microsoft Deployment Toolkit (MDT).

To accomplish the single image goal, the image must be configured to be as basic as possible. Only components which are used in all computers and configurations in the organization should be included. The ideal, universal single image is actually included on the original installation media (either OEM or volume license media) for the operating system. This image file name is **install.wim**, and is sometimes referred to as the *vanilla image*.

Although the vanilla **install.wim** image is the ideal single image, there are a variety of reasons why an organization might elect to create a customized image, such as:

- Customizations only available through Sysprep and image creation
  For example: Customization of the local default user profile can only be performed by using Sysprep and an answer file configured with the **CopyProfile** setting. This instructs Windows Setup to copy the configuration of the Administrator profile to the default user profile before resetting the Administrator profile.
- Deployments of limited scope
  For example: If tasked with deploying only to Surface Pro 3 devices with an identical set of applications as quickly as possible, creating a fully-customized image complete with drivers and applications may be quicker than automating application installation.
- Incompatibility with automated installation
  For example: Applications that feature only an installation wizard but do not support installation via the command line cannot be deployed outside an image.
- Policy requirements
  For example: If an organization's policy is in place that requires all systems be protected and secured by a third party product, it may be required that this product be included in a custom image to ensure those requirements are met.

Using a Virtual Machine as a Reference System

Though the process of creating a system image includes running Sysprep with the **Generalize** option (which is designed to remove system specific information and configuration from the image to facilitate deployment to disparate hardware), there are often components which are not compatible with the **Generalize** process which ultimately interfere with deployment to different hardware. One of the most notable examples are graphics drivers and their associated controlling software. The basic .inf drivers that are stored in the Windows folder are removed by the **Generalize** step, but components like the NVIDIA Control Panel and AMD Catalyst Control Center are not always reliably removed as they are installed not as drivers, but applications.

To avoid such issues, the best practice is to create images from a reference system which is virtual. Virtual environments are greatly simplified when contrasted against physical systems and do not require any complex drivers which have application style components. There are many virtualization solutions available, and any will work as a platform for image creation. The solution included with Windows Server 2008 and newer is Hyper-V, which is also included with Windows 8 Professional or Enterprise and newer Windows clients.

Note: Images are not compatible across architectures or firmware types. For example, an image of a 64 bit (x86-64) environment cannot be deployed to a 32 bit (x86) environment.

Selecting Applications for the Base Image

Another consideration when planning images is which applications to include in the base image. As described with the single image goal, the ideal configuration for an environment to be captured is as few applications and drivers as possible. With that said, there are certainly times when an application does need to be installed in the base image. For example, some applications cannot be configured through installation or scripts and require that they be configured in the base image, or as mentioned before there are times when it is simply easier to create a fully configured image for a project where deployment will only be to one type of device with one set of applications.

When selecting the applications to include in an image, there are some points which warrant consideration. Among the most important is the interaction of an application with Sysprep. Some applications are aware of Sysprep, and will reset configurations and activation information when Sysprep is run. An example of this is Microsoft Office. One class of software noted for incompatibility with Sysprep is security software. Modern security software is often designed to protect itself and the core system files from unauthorized access, but those same security measures can also conflict with Sysprep in a way which produces an image which has been prepared but will not boot and which cannot be revered to a pre-Sysprep state.

Also worth consideration are application deployment solutions that can distribute applications to a live operating system. Some notable solutions include Windows Intune, System Center Configuration Manager, and a Post Deployment MDT Task Sequence. In the case of the latter, it may be beneficial to include any application that is not explicitly required in the base image as an application deployed by MDT. This allows for both deployment of the application with a new operating system and a separate deployment of the application to systems that only need the application.

Planning for Deployment

When preparing for a deployment, there are several best practices which should be considered. These best practices have been shown to increase efficiency and to reduce the impact of issues that might be encountered during the deployment process. The more complex your environment or the larger the organization, the more likely it is that you'll encounter unforeseen issues. This section outlines some best practices to consider to minimize this impact.

Laboratory Testing

To help ensure that conflicts and incompatibilities are not encountered when performing a deployment, the first best practice is to test your deployments in a laboratory environment before piloting and deploying into production. By testing each task and process before it is implemented in a way that can impact users, issues which would otherwise impact uptime and the ability to perform business are often found and resolved before users encounter them. This is shown in Figure 2.2.

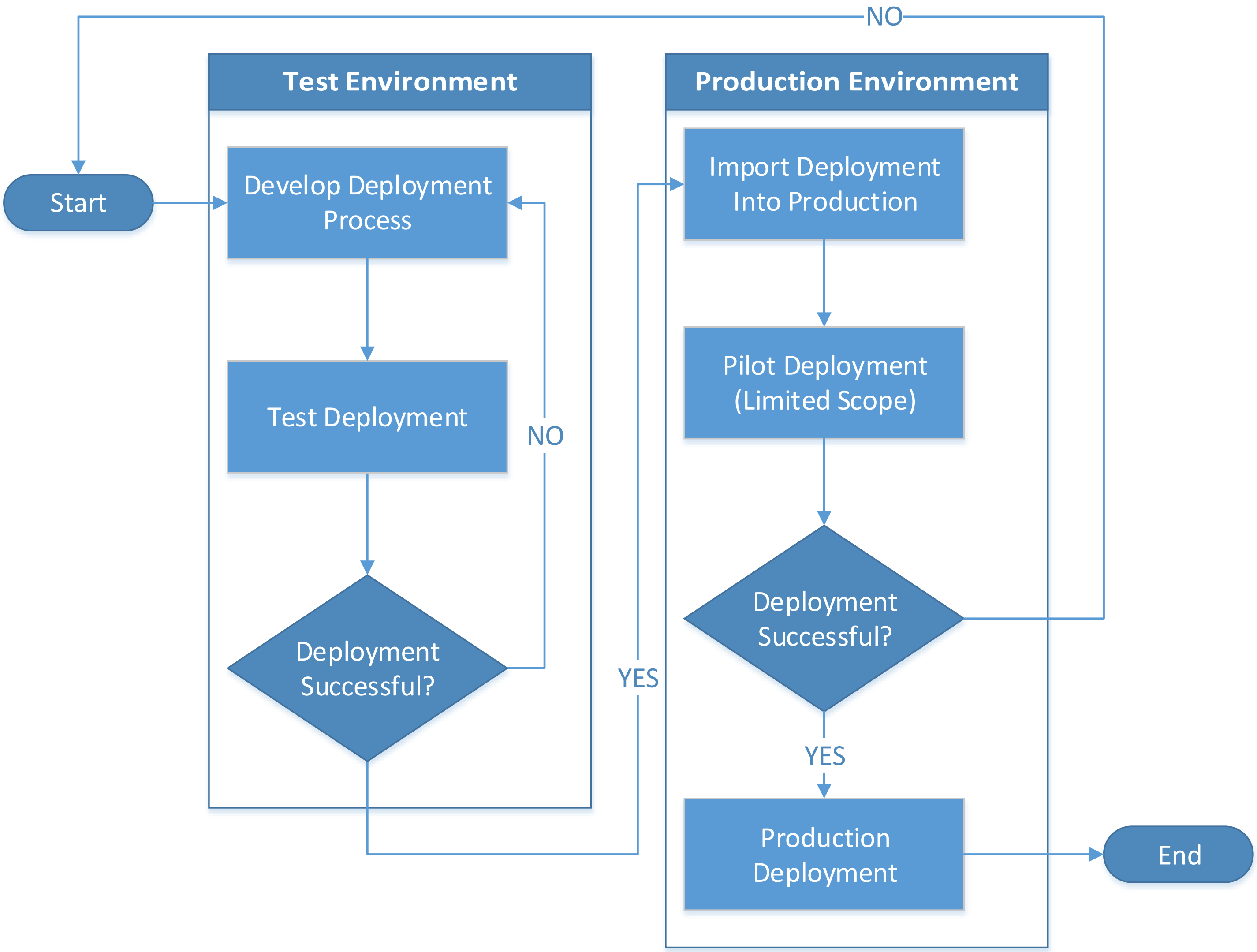


Figure 2.2: Process for Testing and Piloting a Deployment.

Pilot Deployments

Once you have tested your deployments in a lab or VM, it is a good idea to deploy into production on a limited basis. Though lab testing can uncover many of the issues that would be faced by users, there may be unforeseen circumstances that exist in your production environment. Some important considerations for sizing a pilot deployment include:

- Support staff
  Whether it be to explain how the user interface has changed or a system crash caused by an unforeseen incompatibility, the users of a new piloted operating system are likely to encounter issues requiring attention. This increased need for support should be considered before deploying to users who might overwhelm support staff.
- Pilot scope
  When selecting users for a pilot, it is important to consider which users would represent a reasonable facsimile

of the production environment. For example, if you are deploying organization wide, but you pilot the deployment only to the financial department, the pilot does not provide a reasonable indication that the deployment will likewise be successful in the graphics department where hardware and software configurations may be different.

- Pilot duration
  The more complex an environment, the more time you should give to pilot a deployment. It is important to allow enough time for the computers and users involved in the pilot program to uncover any issues with applications, configurations, drivers, etc.
- Comparable usage
  It is important that users involved in a pilot deployment use the computers in the same way as a production system to ensure that potential issues or bugs are uncovered. For example, if users are allowed to work offsite with a production Surface Pro 3 device, they should be allowed to do so in the pilot program as well. This will ensure that any incompatibilities with devices in offsite environments are also uncovered.

Staggered Deployments

In a staggered deployment, the organization or production environment is divided into smaller sections with similar requirements and deployment is performed to these smaller sections one at a time. For example, consider an organization that has these functional areas:

- Executive
- Administrative
- Design
- IT

You likely want to deploy to each functional area/department at a time instead of all departments at once. You might want to consider the "importance" of those functional areas. You want to ensure there are no deployment problems before deploying to your executives. Alternatively, it is common to break up deployments by geographical location. In an organization with offices in three separate buildings, the deployments may be performed by building.

Proper planning of a deployment can help to avoid the scenario where a deployment causes work stoppage or falls behind schedule. With the highly granular and modular nature of the Microsoft Deployment Toolkit, the deployment process can be divided or split without a loss of efficiency. The work done to deploy to one part of an organization can easily translate to another part with the ability to copy or link deployment shares and to manage applications and drivers separate from the system images.

"White Glove" Delivery

Receiving a new computer can be a radical change for some users. Not all users adjust to the changes of a new device at the same pace and, in some cases, users can end up frustrated or dissatisfied with a device simply due to a lack of familiarity that is otherwise a significant improvement. Some scenarios where this commonly occurs include:

- Changing between operating system versions, such as moving from Windows 7 to Windows 8.1
- Changing between form factors, such as replacing a desktop with a tablet
- Introducing new technologies, such as touch capabilities

A recommended tactic to help the end user adjust to the new experience is a “*white glove” delivery*, in which IT or support staff deliver the new device. When delivering the device, they review with the user the new features or functionality, and assist the user in this adjustment process. When a user adjusts to a new Surface Pro 3 device, it may encompass multiple scenarios at the same time (new form factor, touch, and new operating system). Therefore, as a best practice, make sure you understand the needs of your users and try to understand their pain points so you can address them proactively. It may be a good idea for your organization to construct a welcome guide or video to help guide users through the process. For Surface Pro 3 readiness materials, see the References section in the Appendix.

PART II

DEPLOYMENT STEP-BY-STEP

Chapter 3 – Manual Deployment with MDT

This chapter shows you how to perform a basic deployment, which includes no customization. It simply shows you how to install and configure all required deployment tools, then deploy a preconfigured image, **install.wim**, to a Surface Pro 3 device from a deployment computer, known throughout this chapter as a manual deployment. In a manual deployment, the user is prompted to input many fields, such as administrator password, domain, etc. However, because the answers to the prompted questions are not preconfigured in this deployment scenario, it is the simplest type of deployment. Subsequent chapters show increasing levels of automation, but also increase the complexity of configuring the deployments.

The manual deployment scenario is not intended to be a best practice for a large enterprise, but may be appropriate for a small business where customization will take place after installation or serve as a framework for additional deployment configurations. In either case, if you have never performed a deployment, it is a good idea to follow the procedures in this chapter to serve as an introduction to how the tools work.

Caution: Following the instructions in this chapter will overwrite the operating system and data on your Surface Pro 3 device.

The manual deployment scenario discussed in this chapter is comprised of two physical computers: A computer running the deployment tools (referred to as the *deployment server*) and a Surface Pro 3 device, known as the *deployment target*. The computer running the deployment tools in this scenario requires Windows Deployment Services (WDS), so it must run any supported version of Windows Server.

Note: The deployment server can be either physical or virtual, but must have connectivity to the same network as the Surface Pro 3.

The environment for the manual deployment scenario, as shown in Figure 3.1, is configured as follows:

- **Deployment Server** – Windows Server with deployment tools installed
- **Target Computer** – Surface Pro 3 device

Note: Windows Server 2012 or newer is recommended to ensure compatibility between the included Windows Deployment Services and the UEFI platform used by Surface Pro 3.

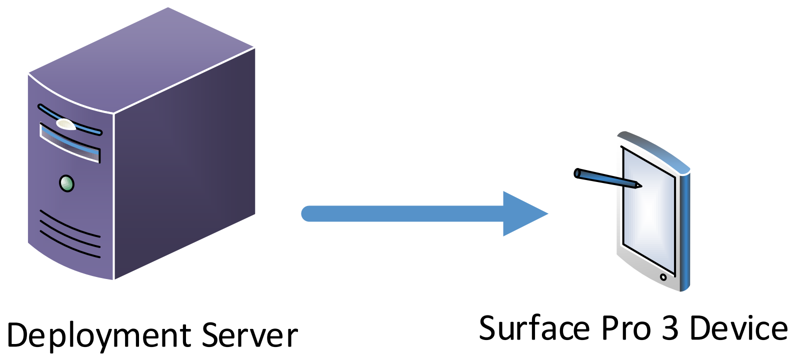


Figure 3.1: Overview of Lab Environment.

The overall process is that deployment server running the deployment tools is responsible for deploying **install.wim** as a base image to the Surface Pro 3 device. Any desired customizations will need to be performed directly on the device(s) after deployment, or you can customize your deployments by incorporating elements of more complex scenario examples in later chapters of this guide.

Installing Deployment Tools

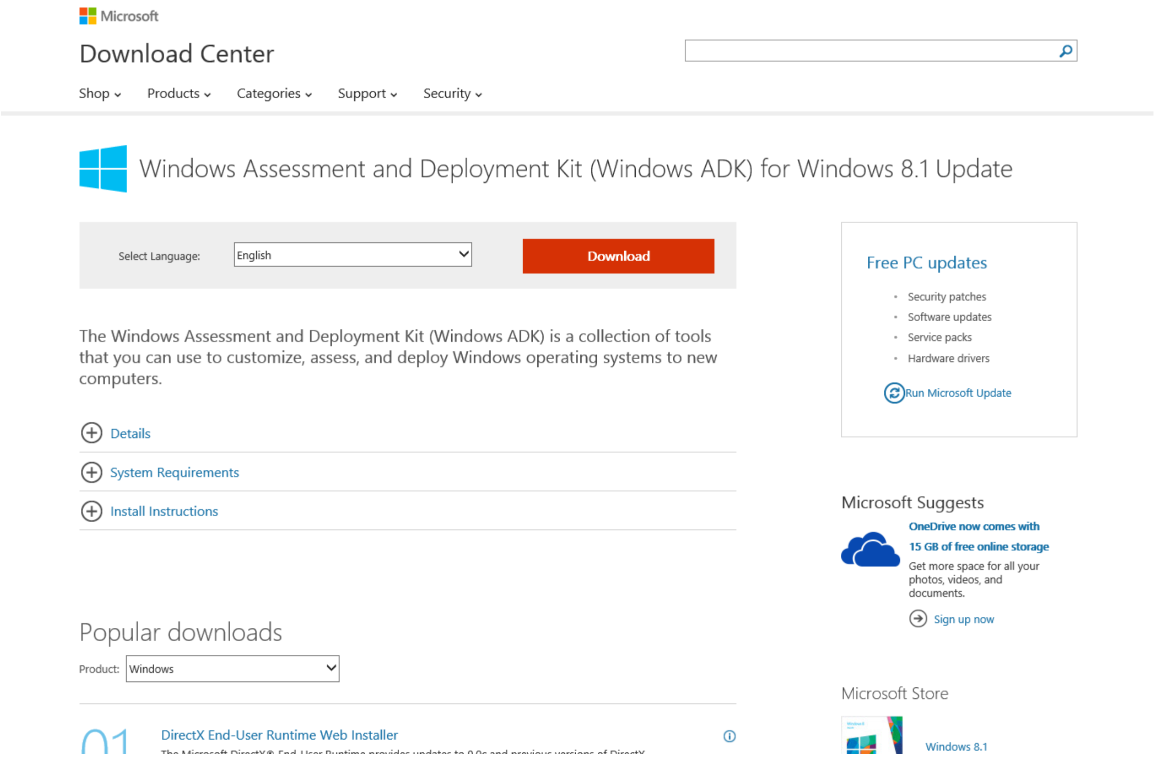
The first step in any deployment is to ensure you have the deployment tools installed on the deployment server, which must be installed in the following order:

- Windows Assessment and Deployment Toolkit (or Windows ADK) – contains the foundation needed by MDT.
- Microsoft Deployment Toolkit (MDT)
- Windows Deployment Services (WDS)

Note: There is no charge to download and install Windows ADK or MDT. There is also no charge for WDS, as long as you already have a licensed installation of Windows Server

Windows Assessment and Deployment Kit

The installation files for the Windows ADK are found online at the Microsoft Download Center. When downloading these files, it is important to select the most recent version that is compatible with your operating system, which at the time of this writing is the Windows ADK for Windows 8.1 Update. The link is http://go.microsoft.com/fwlink/?LinkId=293840, which brings you to the download page, shown in Figure 3.2.



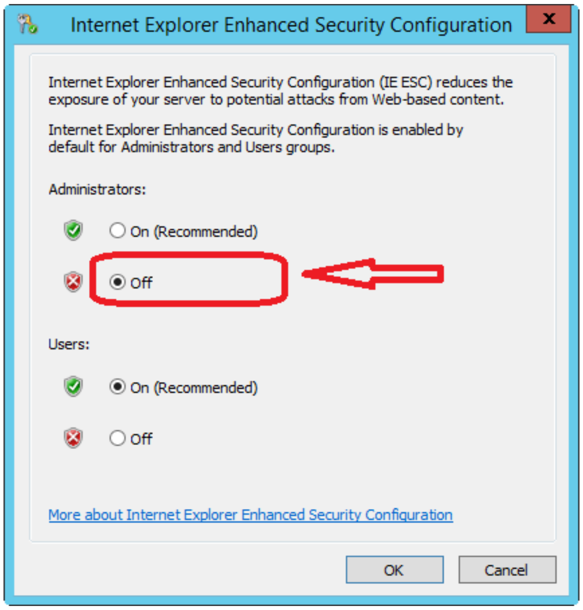
Windows Assessment and Deployment Kit (Windows ADK) for Windows 8.1 Update

Select Language: English

The Windows Assessment and Deployment Kit (Windows ADK) is a collection of tools that you can use to customize, assess, and deploy Windows operating systems to new computers.

Figure 3.2: Downloading Windows ADK.

To permit downloads in Internet Explorer (IE) on Windows Server 2012 R2, you'll need to disable Internet Explorer Enhanced Security Configuration (IE ESC), which is shown in Figure 3.3. This can be done in Windows Server 2012 R2 in the Local Server tab of Server Manager.


Internet Explorer Enhanced Security Configuration

Internet Explorer Enhanced Security Configuration (IE ESC) reduces the exposure of your server to potential attacks from Web-based content.

Internet Explorer Enhanced Security Configuration is enabled by default for Administrators and Users groups.

Administrators:

○ On (Recommended)

● Off

Users:

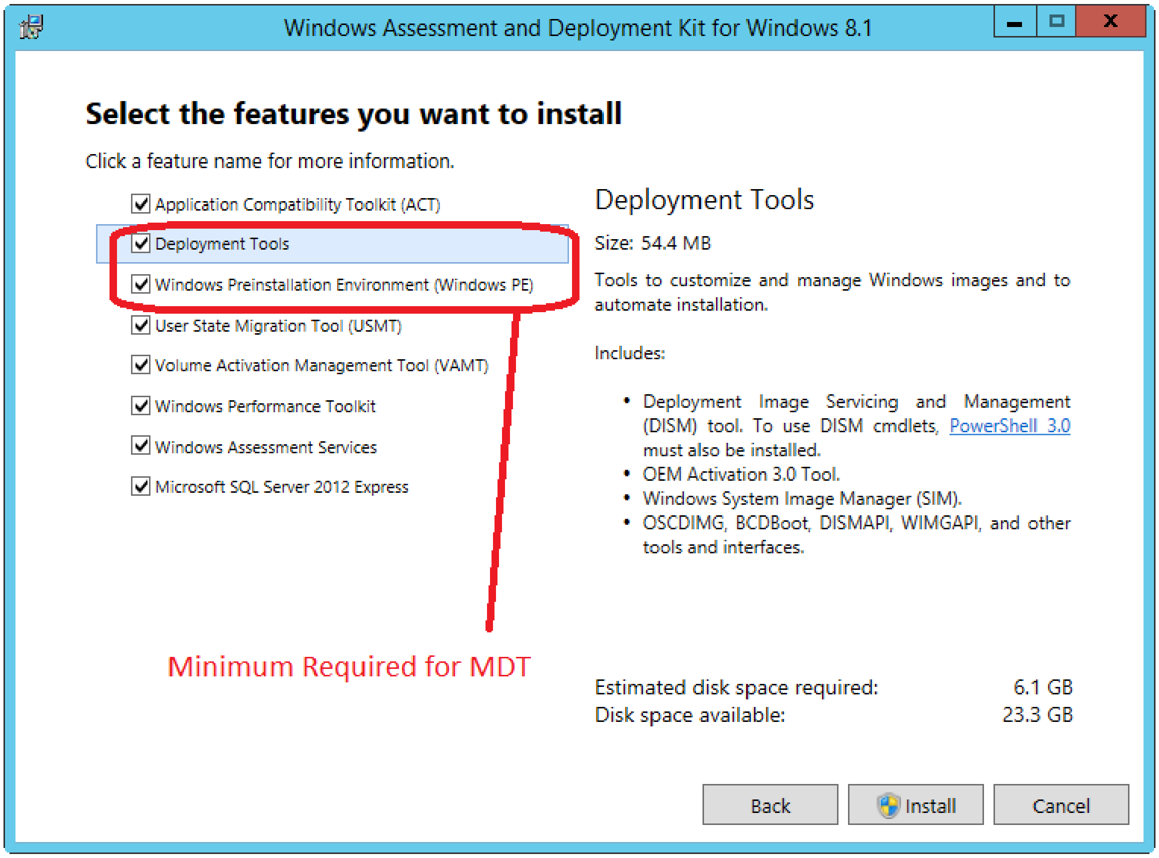
● On (Recommended)

○ Off

More about Internet Explorer Enhanced Security Configuration
OK
Cancel

Figure 3.3: Disabling Enhanced Security Configuration.

The Windows ADK download includes a small setup file that is used to select and download only the desired components. It presents you with a screen where you select the desired products you would like to install, as shown in Figure 3.4. The bare minimum required for MDT are the **Deployment Tools** and **Windows Preinstallation Environment (WinPE)** options.



Windows Assessment and Deployment Kit for Windows 8.1

Select the features you want to install

Click a feature name for more information.

- ☑ Application Compatibility Toolkit (ACT)
- ☑ Deployment Tools
- ☑ Windows Preinstallation Environment (Windows PE)
- ☑ User State Migration Tool (USMT)
- ☑ Volume Activation Management Tool (VAMT)
- ☑ Windows Performance Toolkit
- ☑ Windows Assessment Services
- ☑ Microsoft SQL Server 2012 Express

Minimum Required for MDT

Deployment Tools

Size: 54.4 MB

Tools to customize and manage Windows images and to automate installation.

Includes:

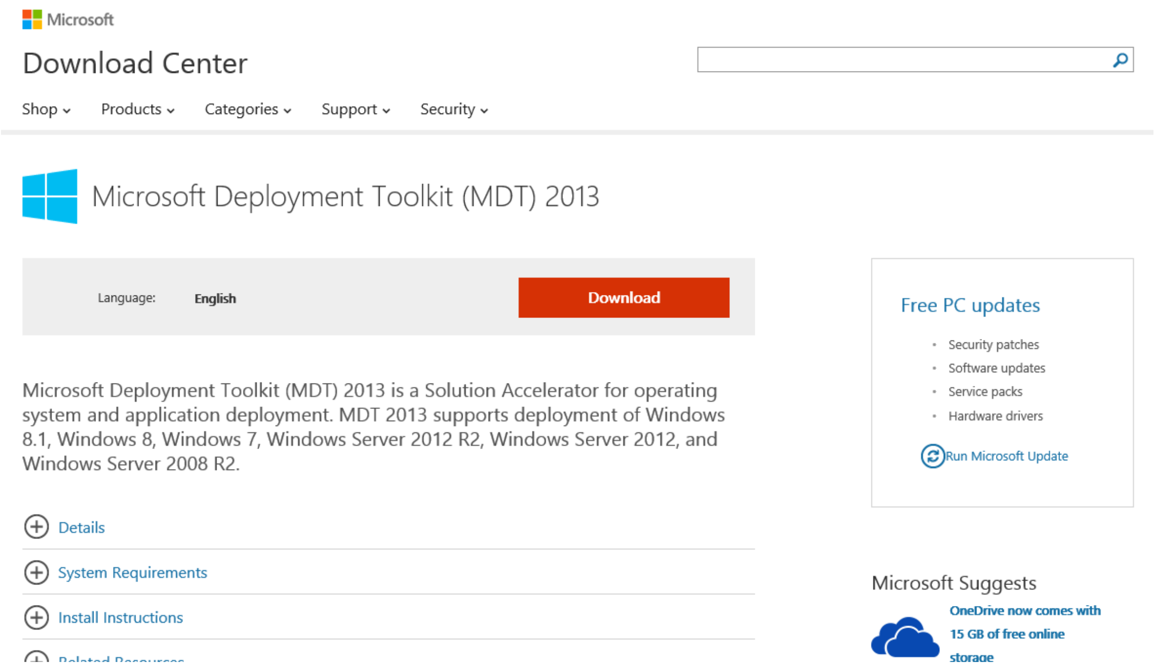
- Deployment Image Servicing and Management (DISM) tool. To use DISM cmdlets, PowerShell 3.0 must also be installed.
- OEM Activation 3.0 Tool.
- Windows System Image Manager (SIM).
- OSCDIMG, BCDBoot, DISMAPI, WIMGAPI, and other tools and interfaces.

Estimated disk space required: 6.1 GB
Disk space available: 23.3 GB

Figure 3.4. Windows ADK Installation Options.

Microsoft Deployment Toolkit

After the Windows ADK is installed, you need to download and install the Microsoft Deployment Toolkit (MDT), which is the primary tool you'll use for your deployments. The link to the main MDT page is http://technet.microsoft.com/en-US/windows/dn475741. From there you can select the latest MDT download that is applicable for your operating system. At the time of this writing, MDT 2013 was the latest version, as shown in Figure 3.5.



Microsoft Deployment Toolkit (MDT) 2013

Microsoft Deployment Toolkit (MDT) 2013 is a Solution Accelerator for operating system and application deployment. MDT 2013 supports deployment of Windows 8.1, Windows 8, Windows 7, Windows Server 2012 R2, Windows Server 2012, and Windows Server 2008 R2.

Free PC updates

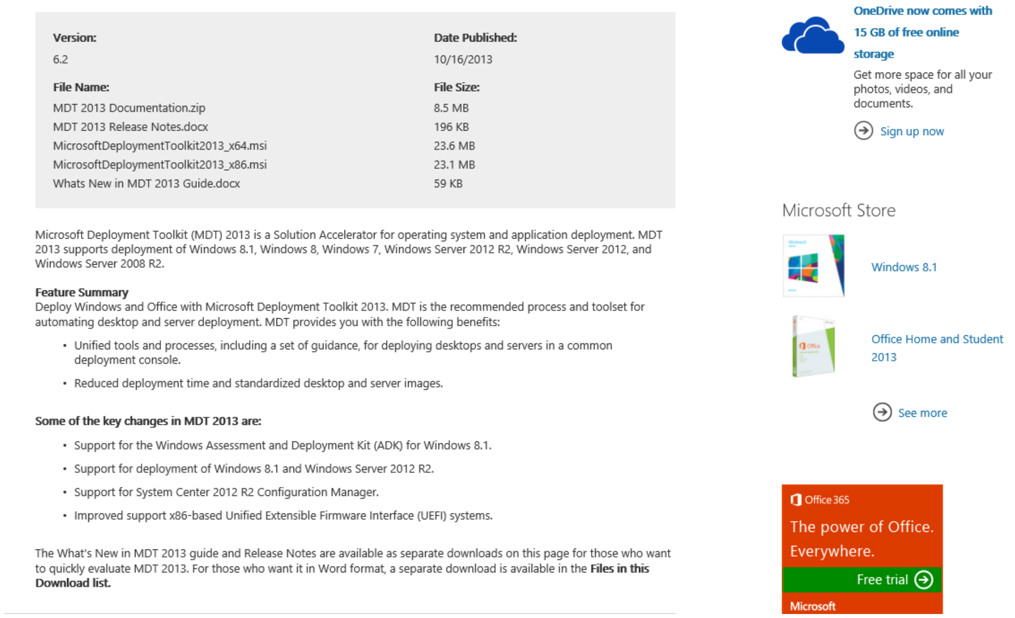
- Security patches
- Software updates
- Service packs
- Hardware drivers

Microsoft Suggests

OneDrive now comes with 15 GB of free online storage

Figure 3.5: Downloading Microsoft Deployment Toolkit (MDT) 2013.

When downloading MDT, the only required component is the installer for the processor architecture on which MDT will be installed. The installers are the MSI files designated as x64 for 64-bit and x86 for 32-bit architectures respectively. Also available is an extensive set of documentation including the standard deployment guides for Windows. These options are shown in Figure 3.6.



Version:	Date Published:
6.2	10/16/2013

File Name:	File Size:
MDT 2013 Documentation.zip	8.5 MB
MDT 2013 Release Notes.docx	196 KB
MicrosoftDeploymentToolkit2013_x64.msi	23.6 MB
MicrosoftDeploymentToolkit2013_x86.msi	23.1 MB
Whats New in MDT 2013 Guide.docx	59 KB

Microsoft Deployment Toolkit (MDT) 2013 is a Solution Accelerator for operating system and application deployment. MDT 2013 supports deployment of Windows 8.1, Windows 8, Windows 7, Windows Server 2012 R2, Windows Server 2012, and Windows Server 2008 R2.

Feature Summary
Deploy Windows and Office with Microsoft Deployment Toolkit 2013. MDT is the recommended process and toolset for automating desktop and server deployment. MDT provides you with the following benefits:

- Unified tools and processes, including a set of guidance, for deploying desktops and servers in a common deployment console.
- Reduced deployment time and standardized desktop and server images.

Some of the key changes in MDT 2013 are:

- Support for the Windows Assessment and Deployment Kit (ADK) for Windows 8.1.
- Support for deployment of Windows 8.1 and Windows Server 2012 R2.
- Support for System Center 2012 R2 Configuration Manager.
- Improved support x86-based Unified Extensible Firmware Interface (UEFI) systems.

The What's New in MDT 2013 guide and Release Notes are available as separate downloads on this page for those who want to quickly evaluate MDT 2013. For those who want it in Word format, a separate download is available in the **Files in this Download list.**

OneDrive now comes with 15 GB of free online storage

Get more space for all your photos, videos, and documents.

Figure 3.6: MDT 2013 Download Options.

After you download and run the applicable MSI setup application, follow the prompts and accept all of the defaults.

Windows Deployment Services

After Windows ADK and MDT are installed, you need to install and configure Windows Deployment Services (WDS) to allow network boot in the environment. Each is described in the following sections.

Installing WDS

Because WDS is a role within Windows Server rather than a separate application, it does not need to be downloaded. Instead you install WDS using Server Manager in Windows Server by following these steps:

1. Open Server Manager.
2. Click the **Manage → Add Roles and Features** menu as shown in Figure 3.7.

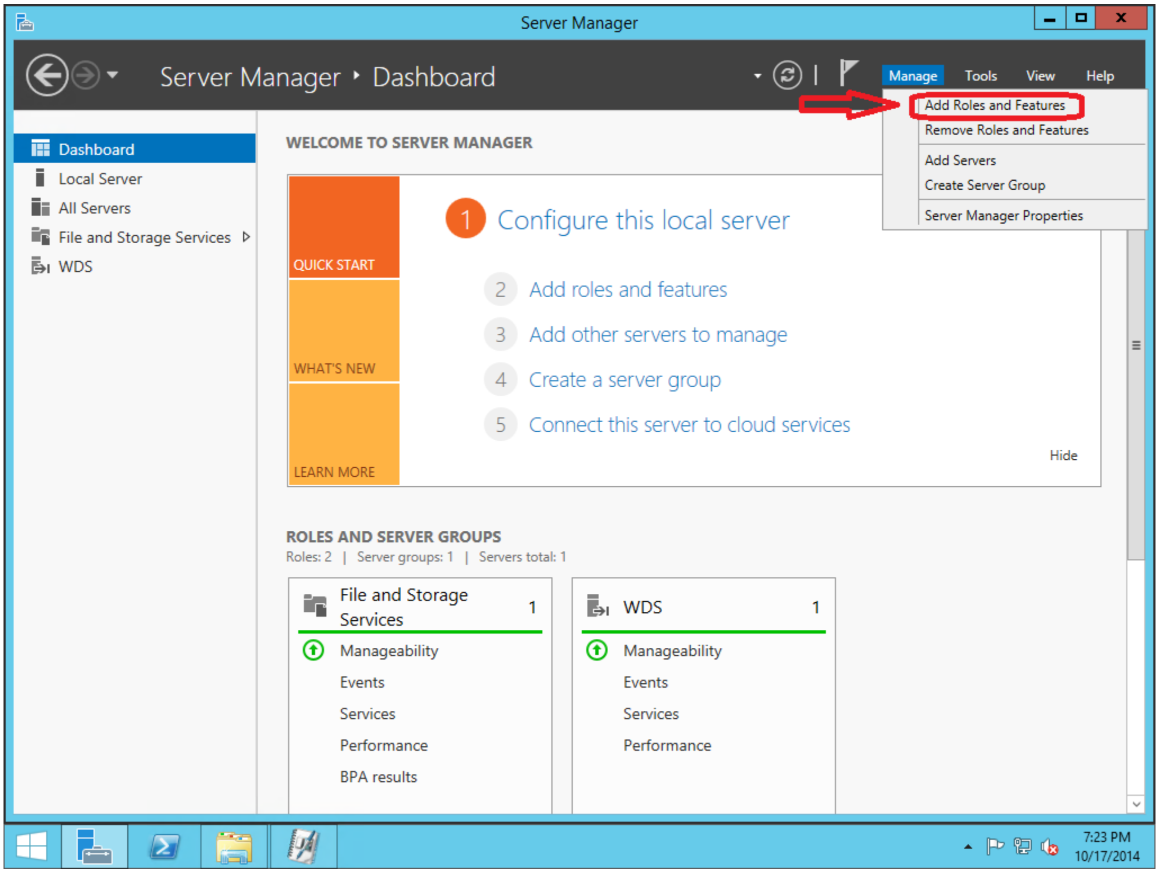
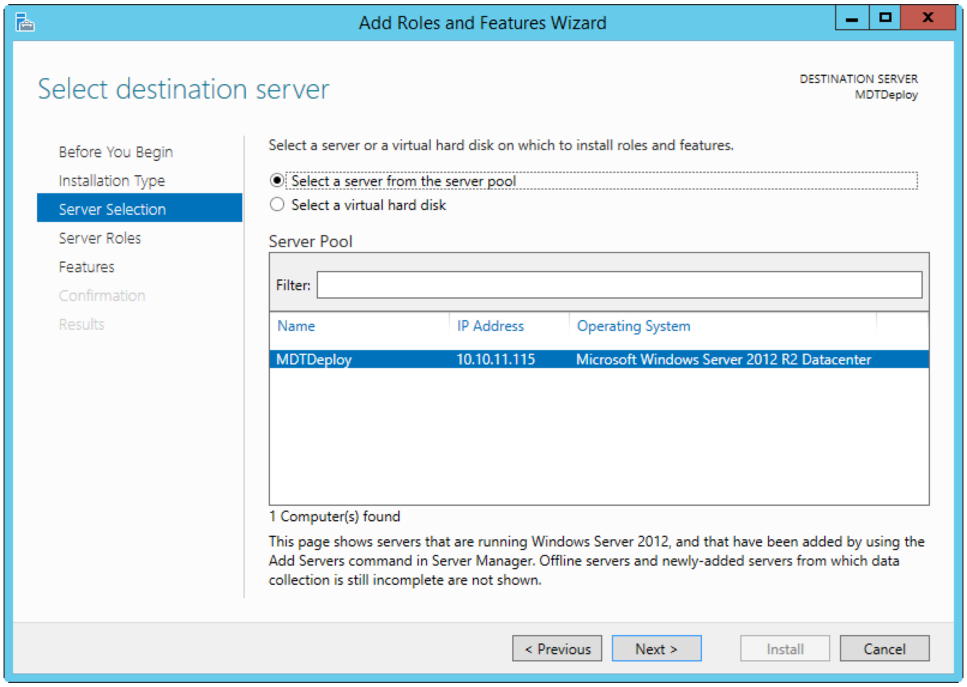


Figure 3.7: Windows Server 2012 R2 Server Manager.

3. Clicking **Add Roles and Features** brings up the **Add Roles and Features Wizard** shown in Figure 3.8.



Select destination server

DESTINATION SERVER
MDTDeploy

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool

○ Select a virtual hard disk

Server Pool

Filter:

Name	IP Address	Operating System
MDTDeploy	10.10.11.115	Microsoft Windows Server 2012 R2 Datacenter

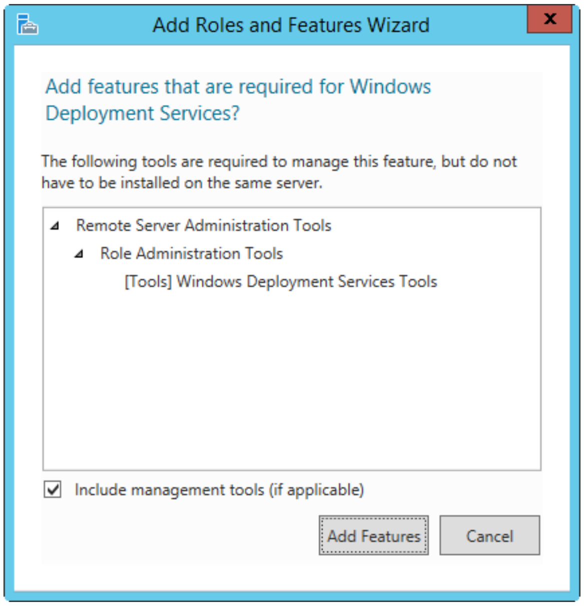
1 Computer(s) found

This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

Figure 3.8: Add Roles and Features Wizard.

4. The **Add Roles and Features Wizard** presents a series of steps, as follows:

- **Before You Begin** – Presents an introductory page. Click **Next**.
- **Installation Type** – Select from one of these installation types:
    - **Role-based or feature-based installation**. Ensure this option is selected and click **Next**.
    - **Remote Desktop Services installation**. This option is used in a Virtual Desktop Infrastructure (VDI) environment, but is out of scope for this guide.
- **Server Selection** – Ensure the correct server is selected and click **Next**.
- **Server Roles** – Select **Windows Deployment Services**. Immediately after clicking this option, you are prompted to add additional required features, as shown in Figure 3.9.



Add Roles and Features Wizard

Add features that are required for Windows Deployment Services?

The following tools are required to manage this feature, but do not have to be installed on the same server.

- Remote Server Administration Tools
  - Role Administration Tools
    - [Tools] Windows Deployment Services Tools

☑ Include management tools (if applicable)

Figure 3.9: Add Roles and Feature Wizard Additional Features Prompt.

Click **Add Features** to accept the new features and return to the Add Roles and Features Wizard main page. Click **Next**.

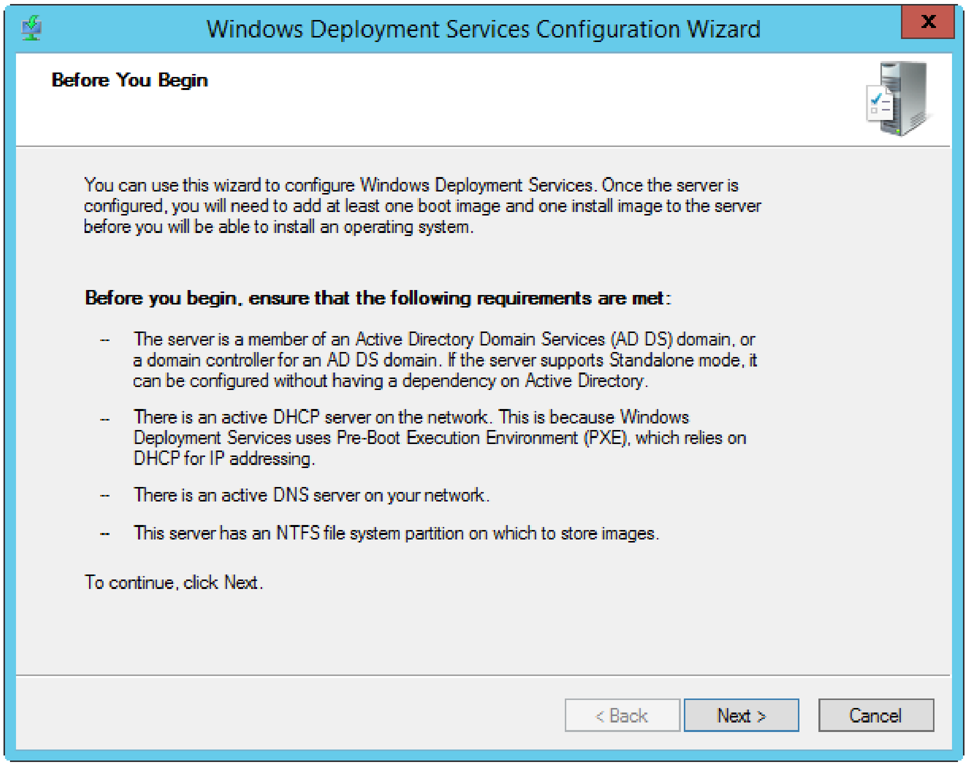
- **Features** – Click **Next** to accept the newly selected required features.
- **WDS** – Description page for WDS. Read this page and click **Next**.
- **Role Services** – Ensure both **Deployment Server** and **Transport Server** are selected.
- **Confirmation** – Displays a summary of the options selected.

Configuring WDS

After installing WDS in the prior section of this chapter, WDS needs to be configured to enable network boot. Network boot enables network adapters capable of PXE boot to access boot media created in the Preparing Boot Media section later in this chapter.

To configure WDS, follow these steps:

1. Launch the **Windows Deployment Services** console from the Start Screen under Administrative Tools on your deployment server.
2. Right-click the name of the deployment server in the **Servers** tree and click **Configure Server**. This launches the Windows Deployment Services Configuration Wizard, as shown in Figure 3.10.



Before You Begin

You can use this wizard to configure Windows Deployment Services. Once the server is configured, you will need to add at least one boot image and one install image to the server before you will be able to install an operating system.

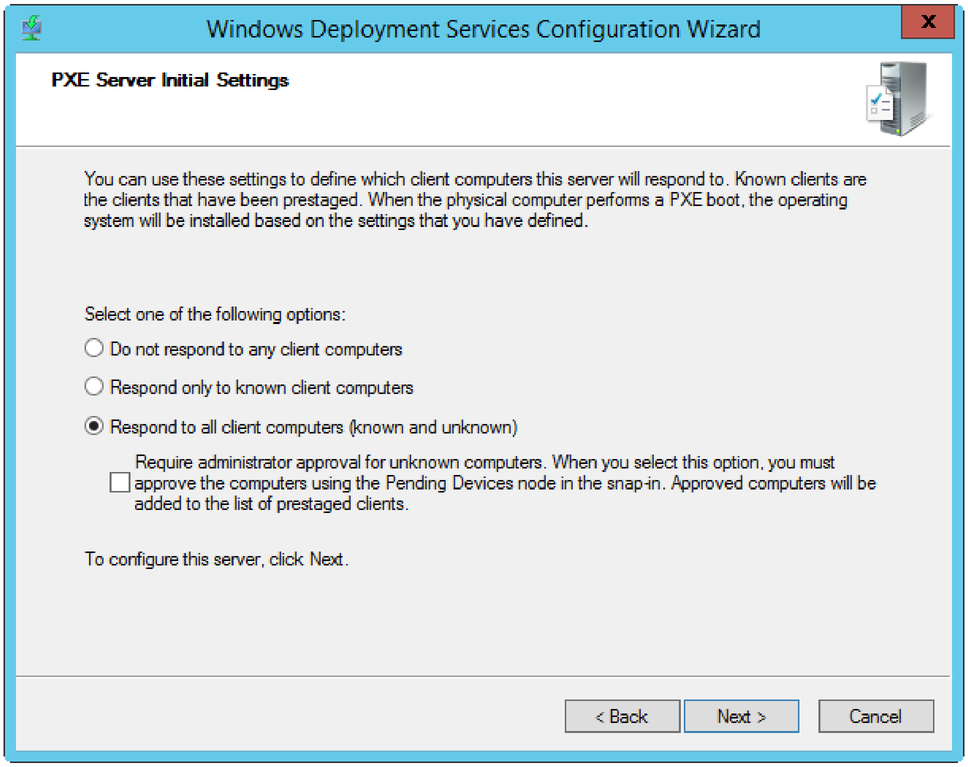
Before you begin, ensure that the following requirements are met:

- The server is a member of an Active Directory Domain Services (AD DS) domain, or a domain controller for an AD DS domain. If the server supports Standalone mode, it can be configured without having a dependency on Active Directory.
- There is an active DHCP server on the network. This is because Windows Deployment Services uses Pre-Boot Execution Environment (PXE), which relies on DHCP for IP addressing.
- There is an active DNS server on your network.
- This server has an NTFS file system partition on which to store images.

To continue, click Next.

Figure 3.10: Windows Deployment Services Configuration Wizard.

3. The **Windows Deployment Services Configuration Wizard** presents a series of steps, as follows:
   - **Before You Begin** – Shows a description of WDS and the prerequisites. Click **Next**.
   - **Install Options** – Select the **Standalone server** option to install WDS without active directory. Click **Next**.
   - **Remote Installation Folder Location** – Enter or select the path where you would like to store the WDS components that will be accessed by the remote client and click **Next**. The selected folder must be located on an NTFS volume and should not be located on the system volume.
   - **PXE Server Initial Settings** – Enables you to configure which clients will receive a response from WDS when attempting to network boot, as shown in Figure 3.11. Select the applicable choice from the following, then click **Next**:
     - **Do not respond to any client computers** – Use this setting if you want to configure WDS without enabling network boot, as in the case when you are staging and configuring a WDS server. This scenario does not use this option.
     - **Respond only to known client computers** – Use this setting if you want to configure which computers WDS will respond to. This scenario does not use this option.
     - **Respond to all client computers (known and unknown)** – Select this option, which ensures that your Surface Pro 3 device can network boot without additional configuration. Additionally, the **Require administrator approval for unknown computers** checkbox can be selected to require approval through the WDS console for unknown machines. For this scenario, do not select this option.



PXE Server Initial Settings

You can use these settings to define which client computers this server will respond to. Known clients are the clients that have been prestaged. When the physical computer performs a PXE boot, the operating system will be installed based on the settings that you have defined.

Select one of the following options:

○ Do not respond to any client computers

○ Respond only to known client computers

● Respond to all client computers (known and unknown)

□ Require administrator approval for unknown computers. When you select this option, you must approve the computers using the Pending Devices node in the snap-in. Approved computers will be added to the list of prestaged clients.

To configure this server, click Next.

Figure 3.11. PXE Server Initial Settings.

- **Task Progress** – Displays a progress bar during the configuration of WDS. Click **Finish** to close the **Windows Deployment Services Configuration Wizard**.

Creating a Deployment Share

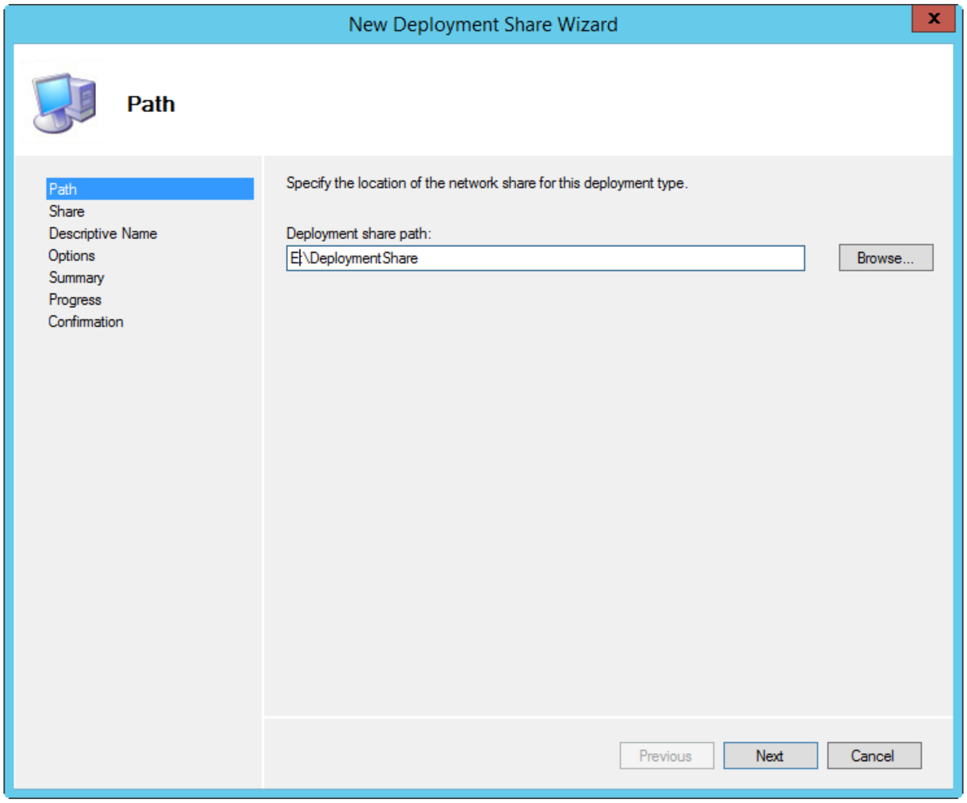
The main user interface in MDT is the Deployment Workbench, which is where you will create task sequences and lists of actions that MDT will perform. Sequences provide the workflow for deployment. They define when and how to perform the various tasks required to produce the desired Windows environment. When they are run they pass the instructions to perform these tasks to the independent components and tools that perform the actions, such as the MDT scripts or tools from the Windows ADK. More information on Task Sequences can be found in the Microsoft Deployment Toolkit section in Chapter 2.

The MDT deployment workbench is comprised of two sections:

- **Information Center** – Contains help documentation and lists installed and available components. This example scenario does not use the information center.

  Caution: The list of installed and available components may be shown for older operating systems, so use with caution.

- **Deployment Shares** – Contains a list of all the deployment shares and sub-folders. By default, there will be no deployment shares listed. Right-click the **Deployment Shares** folder and click **New Deployment Share**. This brings up the **New Deployment Share Wizard**, as shown in Figure 3.12.



Specify the location of the network share for this deployment type.

Deployment share path: E:\DeploymentShare

Figure 3.12: New Deployment Share Wizard.

The **New Deployment Share Wizard** presents a series of sequential steps, as follows:

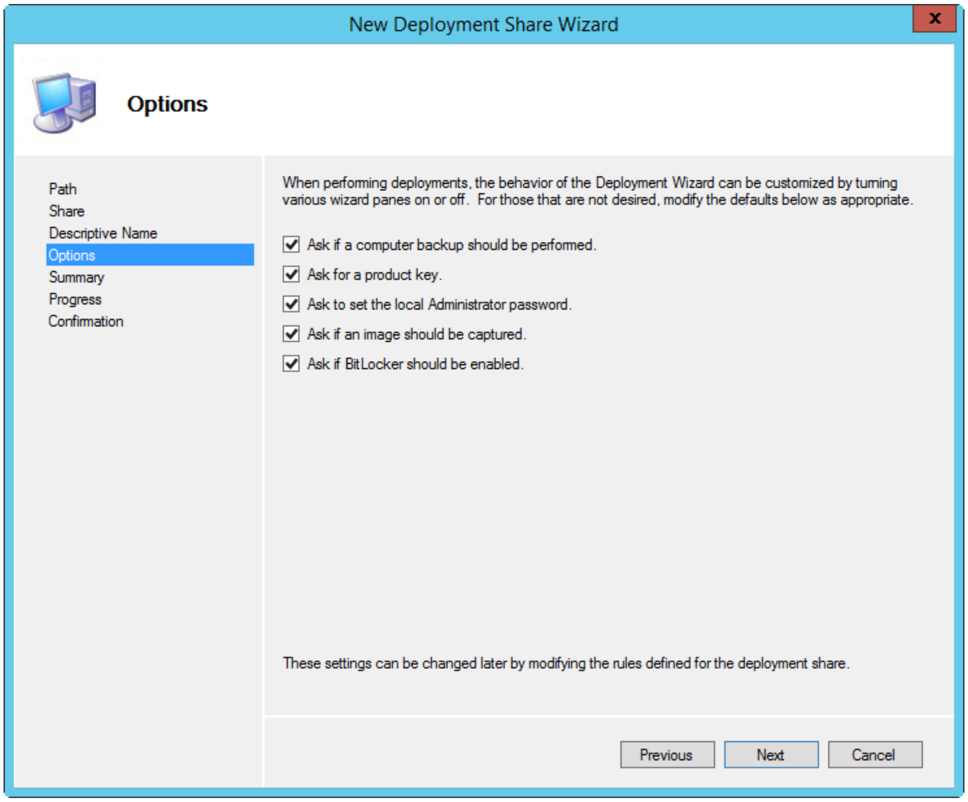
- **Path** – Enter the path to your deployment share. It can reside anywhere you would locate a shared folder, but for this scenario, you can accept the default path of **C:\DeploymentShare**. Click **Next**.
- **Share** – Enter the name of the deployment share. The default inclusion of the dollar sign ($) character indicates that an administrative share is created, causing the deployment share not to be visible when browsing the network. You can accept the default value of **DeploymentShare$**. Click **Next**.

Note: The deployment share name cannot contain spaces. Some of the scripts included in MDT are not compatible with deployment share names that contain spaces.

- **Descriptive Name** – Give the deployment share a descriptive name. By default, this value is **MDT Deployment Share**, which is acceptable for this scenario. This value is used to differentiate between deployment shares in the MDT Deployment Workbench. Click **Next**.
- **Options** – Enables the configurations of defaults for this deployment share, as shown in Figure 3.13. For this scenario, ensure all of the following options are selected, then click **Next**:
  - **Ask if a computer backup should be performed** – If selected, this option prompts the user to create an image backup of the computer before performing the deployment.
  - **Ask for a product key** – If selected, this option prompts the user for product key during the deployment process. This option is not selected by default.

Note: Single license keys must be entered individually on each computer, so this option should be checked in most scenarios. However, MAK volume license keys are specified in MDT task sequences, so this option should not be checked in those scenarios. If you are using KMS volume license activation, this option should be unselected because activation is an automatic process.

- **Ask to set the local Administrator password** – If selected, this option prompts the user for a password for the local **Administrator** account. This option is not selected by default.
- **Ask if an image should be captured** – If selected, this option prompts the user if a system image of the target computer should be created for deployment to other computers. This option is selected by default.
- **Ask if BitLocker should be enabled** – If selected, this option prompts the user if the file system should be encrypted with BitLocker during the deployment process. This option is selected by default.


New Deployment Share Wizard

Options

When performing deployments, the behavior of the Deployment Wizard can be customized by turning various wizard panes on or off. For those that are not desired, modify the defaults below as appropriate.

☑ Ask if a computer backup should be performed.
☑ Ask for a product key.
☑ Ask to set the local Administrator password.
☑ Ask if an image should be captured.
☑ Ask if BitLocker should be enabled.

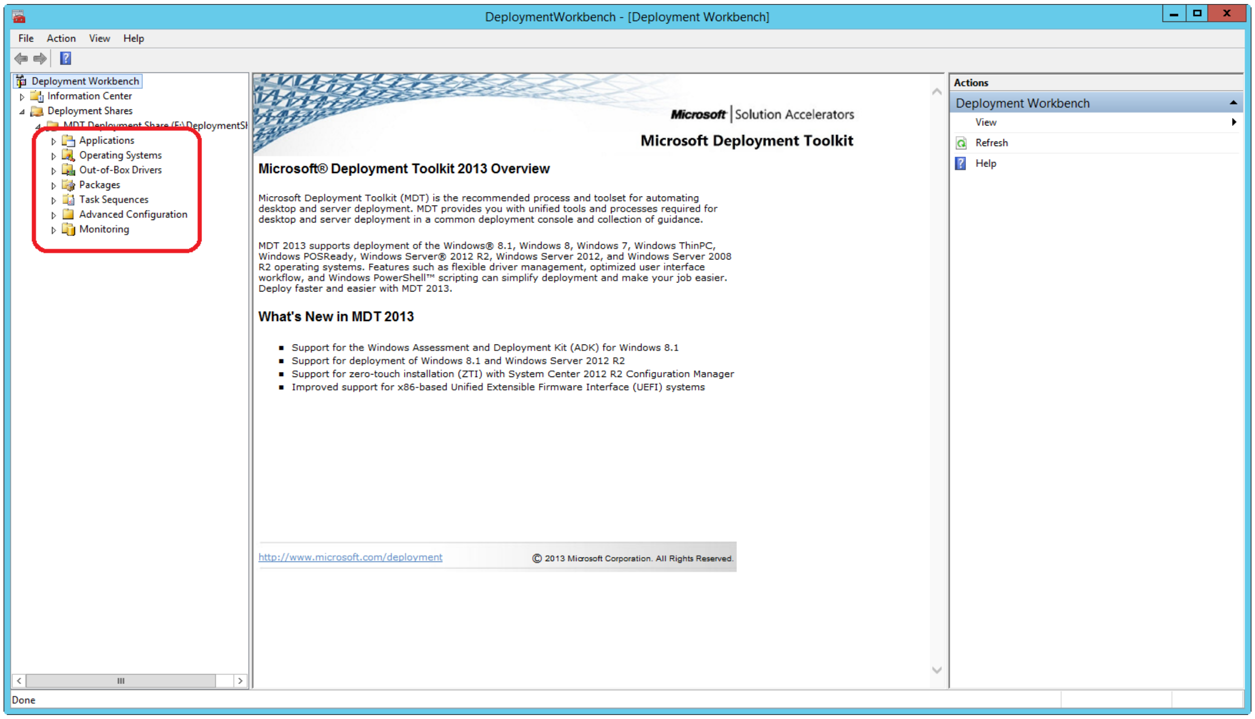
These settings can be changed later by modifying the rules defined for the deployment share.

Figure 3.13: New Deployment Share Options.

All deployment share options are discussed in more detail in Chapter 4.

- **Summary** – Review the summary of your deployment share configuration and click **Next**.
- **Progress** – Displays a progress bar during the creation of the deployment share.
- **Confirmation** – Displays confirmation of success or errors generated during deployment share creation. Click **Finish** to close the **New Deployment Share Wizard**.

After the deployment share is created, you'll see many sub-folders under the name of the deployment share in the **Deployment Shares** tree, as shown in Figure 3.14.



Microsoft® Deployment Toolkit 2013 Overview

Microsoft Deployment Toolkit (MDT) is the recommended process and toolset for automating desktop and server deployment. MDT provides you with unified tools and processes required for desktop and server deployment in a common deployment console and collection of guidance.

MDT 2013 supports deployment of the Windows® 8.1, Windows 8, Windows 7, Windows ThinPC, Windows POSReady, Windows Server® 2012 R2, Windows Server 2012, and Windows Server 2008 R2 operating systems. Features such as flexible driver management, optimized user interface workflow, and Windows PowerShell™ scripting can simplify deployment and make your job easier. Deploy faster and easier with MDT 2013.

What's New in MDT 2013

- Support for the Windows Assessment and Deployment Kit (ADK) for Windows 8.1
- Support for deployment of Windows 8.1 and Windows Server 2012 R2
- Support for zero-touch installation (ZTI) with System Center 2012 R2 Configuration Manager
- Improved support for x86-based Unified Extensible Firmware Interface (UEFI) systems

http://www.microsoft.com/deployment © 2013 Microsoft Corporation. All Rights Reserved.

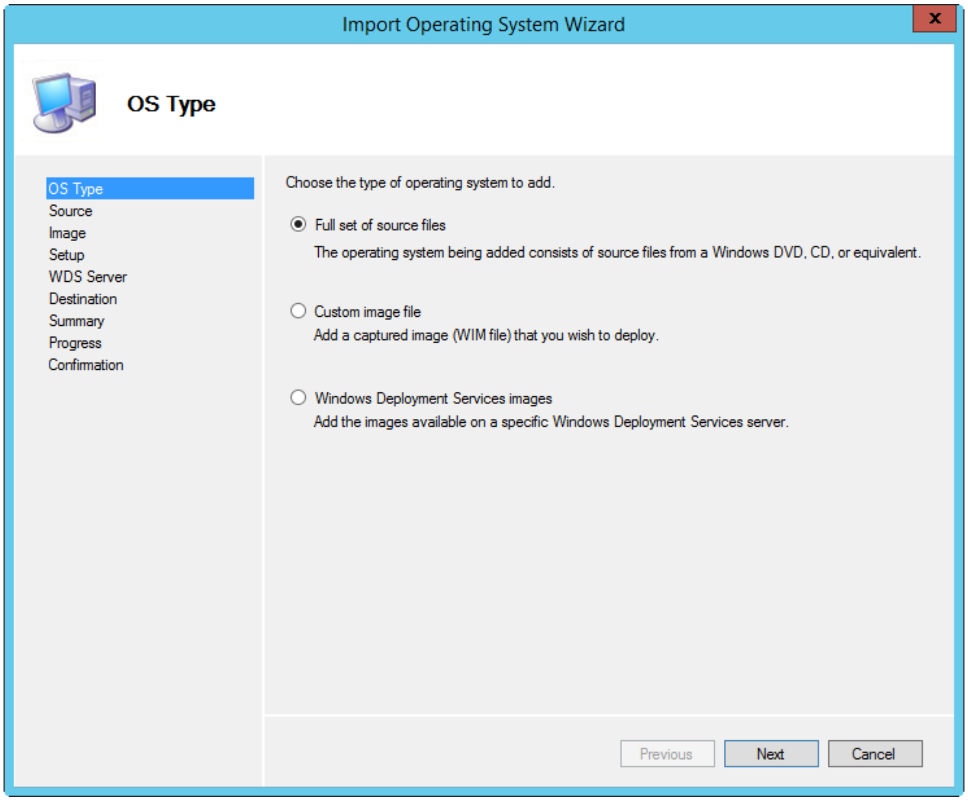
Figure 3.14: Folders Created For New Deployment Share.

Importing an Operating System

A newly created deployment share is empty and contains no operating system files, drivers, or any other configurations. Therefore, the first step after creating a new deployment share is to import the files for the operating system intended for deployment to the target computer(s).

For this scenario, you will import the standard **install.wim** image as the operating system, by following these steps:

1. Locate installation media that contains the **install.wim** file. This installation media is typically located on a physical DVD, USB stick, ISO file, etc.
2. Insert or mount the installation media on the deployment server (where the deployment tools are installed).
3. In the MDT **Deployment Workbench**, expand the newly created deployment share.
4. Right-click **Operating Systems** and click **Import Operating System**. This launches the **Import Operating System Wizard**, as shown in Figure 3.15.



Choose the type of operating system to add.

● Full set of source files
The operating system being added consists of source files from a Windows DVD, CD, or equivalent.

○ Custom image file
Add a captured image (WIM file) that you wish to deploy.

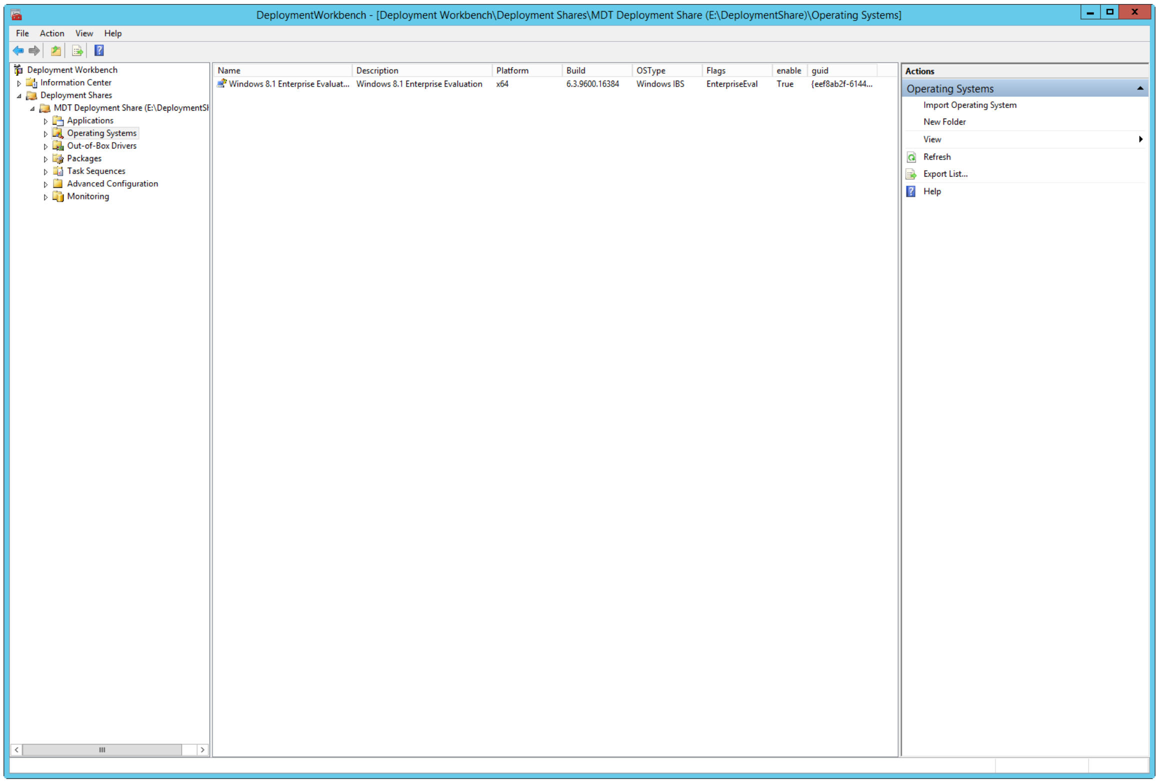
○ Windows Deployment Services images
Add the images available on a specific Windows Deployment Services server.

Figure 3.15: Import Operating System Wizard.

5. The **Import Operating System Wizard** presents a series of steps, as follows:
    - **OS Type** – Select the type of operating system to add. Select the **Full set of source files** option. A full set of files is required for each operating system you will deploy. More details about the other options is discussed in Chapter 4. Click **Next**.
    - **Source** – Enter or browse to the path containing the full set of source files. This will be the drive or mounted ISO file you identified in Step 2. This step is not available if you select **Custom image file** or **Windows Deployment Services images** in the prior step. Click **Next**.
    - **Image** – Enter or browse to the path of your custom WIM file. This step is not available if you select **Full set of source files** or **Windows Deployment Services images** in the first step. Click **Next**.
    - **Setup** – Enter or browse to the set of full source files for the operating system in your custom WIM file. This option is not available if you select **Full set of sources files** or **Windows Deployment Services images** in the first step. Click **Next**.
    - **WDS Server** – Enter the name of the WDS server from which you will import all images. This option is not available if you select **Full set of sources files** or **Custom Image file** in the first step. Click **Next**.
    - **Destination** – Enter the name of the folder where the operating system files will be stored. This folder is created in the deployment share on the deployment server. For example, you could enter **Windows 8.1** as the destination. Click **Next**.
    - **Summary** – Review the summary of your operating system import configuration and click **Next**.
    - **Progress** – Displays a progress bar during the importing of the operating system files.

- **Confirmation** – Displays confirmation of success or errors generated while importing the operating system files. Click **Finish** to close the **Import Operating System Wizard**.

After you import the operating system files and close the **Import Operating System Wizard**, the MDT **Deployment Workbench** will look similar to the one shown in Figure 3.16.



DeploymentWorkbench - [Deployment Workbench\Deployment Shares\MDT Deployment Share (E:\DeploymentShare)\Operating Systems]

Name	Description	Platform	Build	OSType	Flags	enable	guid
Windows 8.1 Enterprise Evaluat...	Windows 8.1 Enterprise Evaluation	x64	6.3.9600.16384	Windows IBS	EnterpriseEval	True	{eef8ab2f-6144...

Figure 3.16: Deployment Workbench after Importing Operating System.

Note: The default name given to the operating system is specified in the operating system source files. You can rename the operating system by right-clicking the imported operating system and clicking **Rename**.

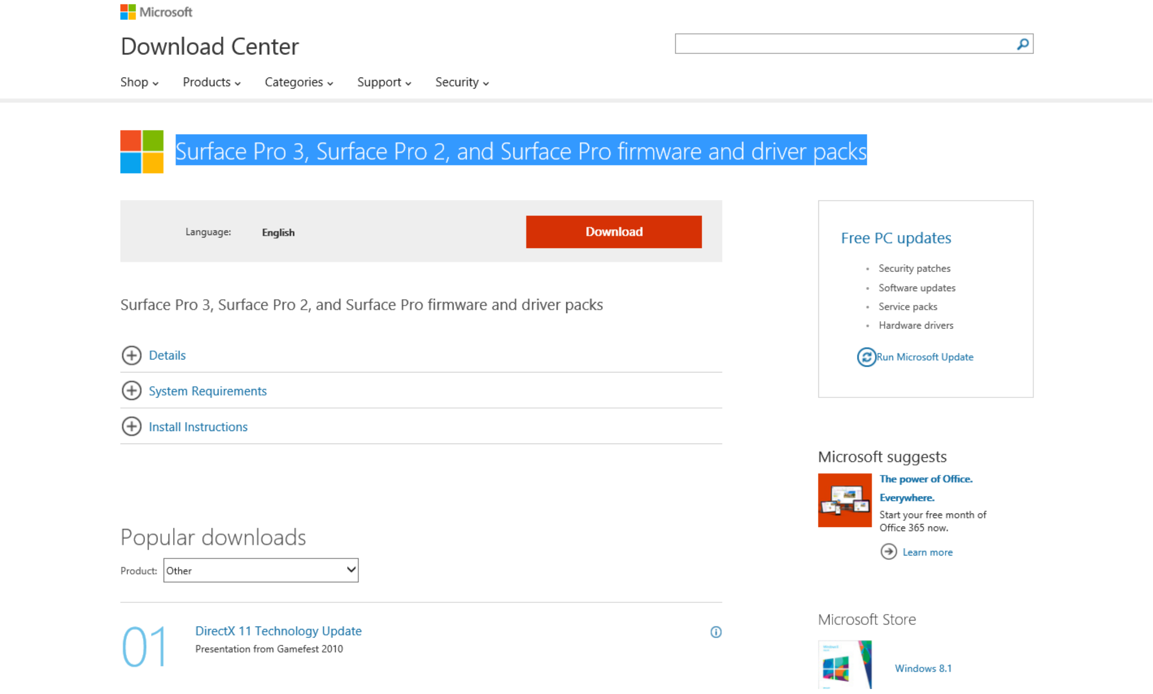
Note: As Surface Pro 3 is a 64 bit device with UEFI, a 64 bit operating system is required.

Importing Drivers

While some computers such as virtual machines, can boot from the MDT boot media without additional drivers, the Surface Ethernet Adapter requires additional drivers that must be added to the boot media. Additionally, the deployed Surface Pro 3 devices require additional drivers to enable the deployed operating system to function as intended. In order to include these drivers in a deployment, they must first be imported into the deployment share.

Downloading the Surface Pro 3 Firmware and Driver Pack

For Surface Pro 3, as well as Surface Pro and Surface Pro 2, drivers are made available through the Microsoft Download Center, on the **Surface Pro 3, Surface Pro 2, and Surface Pro firmware and driver packs** page. This page can be accessed at http://go.microsoft.com/fwlink/?LinkID=301483, and is shown in Figure 3.17.



Microsoft

Download Center

Shop ⌄ Products ⌄ Categories ⌄ Support ⌄ Security ⌄

Surface Pro 3, Surface Pro 2, and Surface Pro firmware and driver packs

Language: English

Download

Surface Pro 3, Surface Pro 2, and Surface Pro firmware and driver packs

⊕ Details

⊕ System Requirements

⊕ Install Instructions

Free PC updates

- Security patches
- Software updates
- Service packs
- Hardware drivers

Run Microsoft Update

Microsoft suggests

The power of Office. Everywhere.

Start your free month of Office 365 now.

Learn more

Popular downloads

Product: Other

01 DirectX 11 Technology Update

Presentation from Gamefest 2010

Microsoft Store

Windows 8.1

Figure 3.17: Microsoft Download Center Page for Firmware and Driver Packs.

At the time of writing, the following resources are available for download:

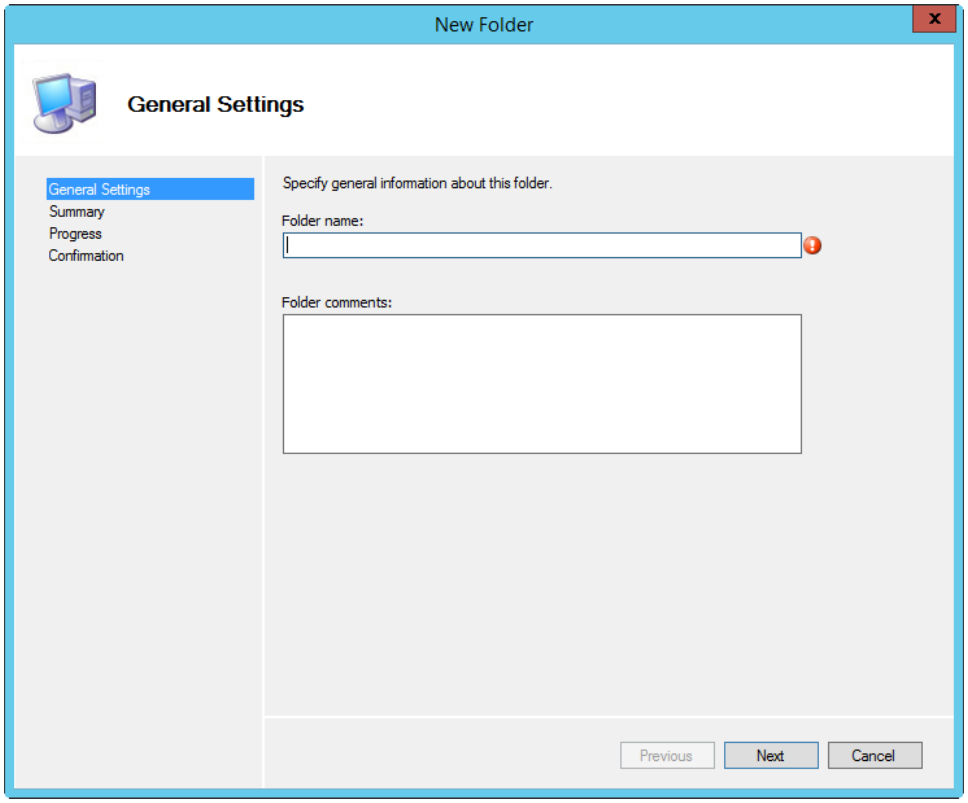
- **Surface Ethernet Adapter.zip** – Provides drivers for the Surface Ethernet Adapter accessory.
- **Surface Gigabit Ethernet Adapter.zip** – Provides drivers for the Surface Gigabit Ethernet Adapter accessory.
- **Surface Pro - Enterprise Deployment Quick Start Guide-June2013.pdf** – Instructions for enterprise deployment for Surface Pro and Surface Pro 2, in English
- **Surface Pro - Enterprise Deployment Quick Start Guide-June2013_JP.PDF** – Instructions for enterprise deployment for Surface Pro and Surface Pro 2, in Japanese.
- **Surface Pro 1 - August 2014.zip** – A collection of the drivers and firmware for Surface Pro.
- **Surface Pro 2 - July 2014.zip** – A collection of the drivers for Surface Pro 2.
- **Surface Pro 3 - September 2014.zip** – A collection of the drivers for Surface Pro 3.
- **SurfacePro3PenDriverOct62014.zip** – An updated driver for Surface Pen.
- **Windows8.1-KB2969817-x64.msu** – An update for the firmware update process.

For Surface Pro 3 deployment, the Quick Start guides and collections for Surface Pro and Surface Pro 2 are not required.

Importing Drivers for Windows PE

When configuring a deployment share for an organization that uses many computer models, each using different drivers, it is advisable to create a separate selection profile for the WinPE boot media. This will help to prevent any conflicts with drivers and functionality that is not provided in WinPE. The drivers most frequently required by WinPE are network and storage drivers. To make drivers available to the selection profile, they must be imported into the deployment share. To import the Surface Ethernet Adapter drivers for WinPE, follow these steps:

1. Open **File Explorer** and navigate to the download location for the Surface Pro 3 drivers.
2. Extract the Surface Ethernet Adapter and Surface Gigabit Ethernet Adapter ZIP archives to a folder on the production deployment server.
3. Open the MDT **Deployment Workbench**.
4. Expand the deployment share tree and select the **Out-of-Box Drivers** folder.
5. Select the **New Folder** option from the **Actions** pane to launch the **New Folder** dialog box as shown in Figure 3.18.



Specify general information about this folder.

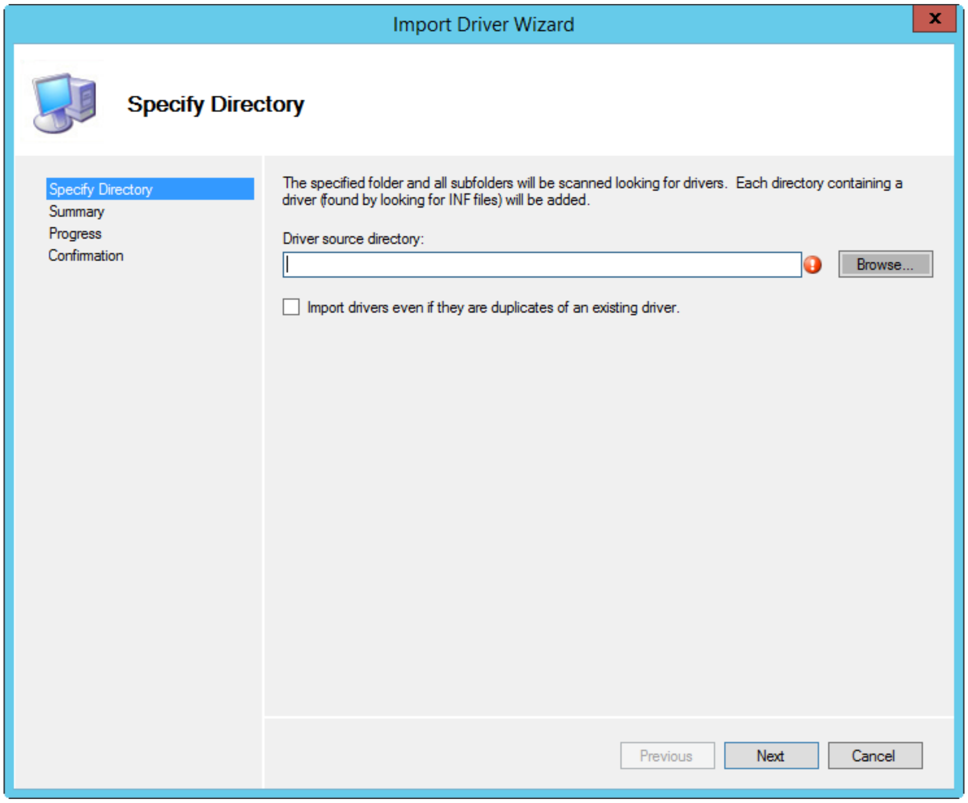
Folder name:

Folder comments:

Figure 3.18: New Folder Dialog Box.

6. The **New Folder** dialog box shows the following options:
   - **General Settings** – Specify the name **WinPE** and any desired comments and then click **Next**.
   - **Summary** – Confirm the specified options and click **Next**.
   - **Progress** – A progress bar will be displayed as the folder is created.
   - **Confirmation** – Confirmation of the successful creation of the folder will be displayed here. Click **Finish**.
7. Select the newly created **WinPE** folder in the **Out-of-Box Drivers** folder.

8. Select the **Import Drivers** option from the **Actions** pane to launch the **Import Driver Wizard**, as shown in Figure 3.19.



The specified folder and all subfolders will be scanned looking for drivers. Each directory containing a driver (found by looking for INF files) will be added.

Driver source directory:

□ Import drivers even if they are duplicates of an existing driver.

Figure 3.19: Import Driver Wizard.

9. The **Import Driver Wizard** presents a series of steps.
   - **Specify Directory** – Enter or browse to the folder in which the extracted drivers are located and click **Next**.

   > **Note**: Drivers are imported at the folder level. Therefore, when you import drivers and specify a folder, all drivers in that folder are imported. WinPE should have only those drivers necessary to boot and connect to the network. In this scenario, only the Surface Ethernet Adapter drivers are required, so it is a good idea to locate all other drivers in a separate folder.

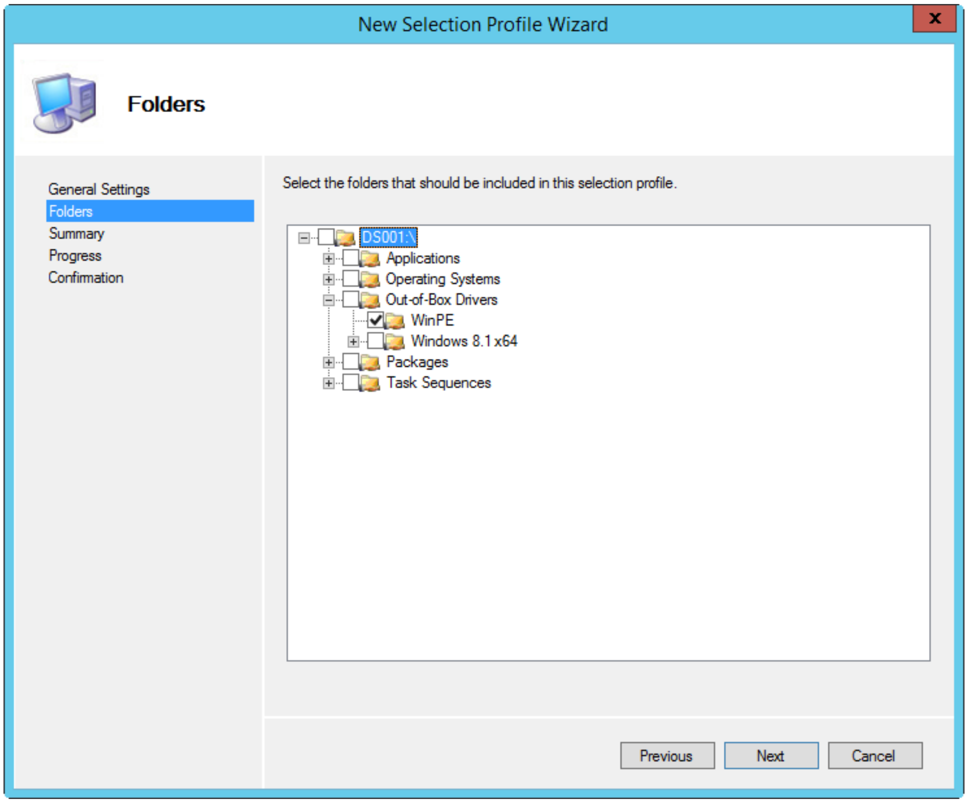
   - **Summary** – Confirm the specified options and click **Next**.
   - **Progress** – A progress bar will be displayed as the drivers are imported.
   - **Confirmation** – Confirmation of the successful import of the drivers will be displayed here. Click **Finish**.
10. Repeat steps 7-9 and the **Import Driver Wizard** if required for the second Ethernet adapter folder.

Creating the WinPE Selection Profile

After the drivers for WinPE are imported into the deployment share, the deployment share needs to be configured to use these drivers when creating boot media by following this procedure:

1. Expand the **Advanced Configuration** folder of the production deployment share in the **Deployment Workbench**.
2. Select the **Selection Profiles** folder.
3. Select **New Selection Profile** from the **Actions** pane to launch the **New Selection Profile Wizard.**
4. The **New Selection Profile Wizard** presents the following options:

- **General Settings** – Specify the name **WinPE** for the selection profile and any desired comments, then click **Next**.
- **Folders** – Expand the deployment share tree and the **Out-of-Box Drivers** folder and check the box next to the **WinPE** folder as shown in Figure 3.20.



New Selection Profile Wizard

Folders

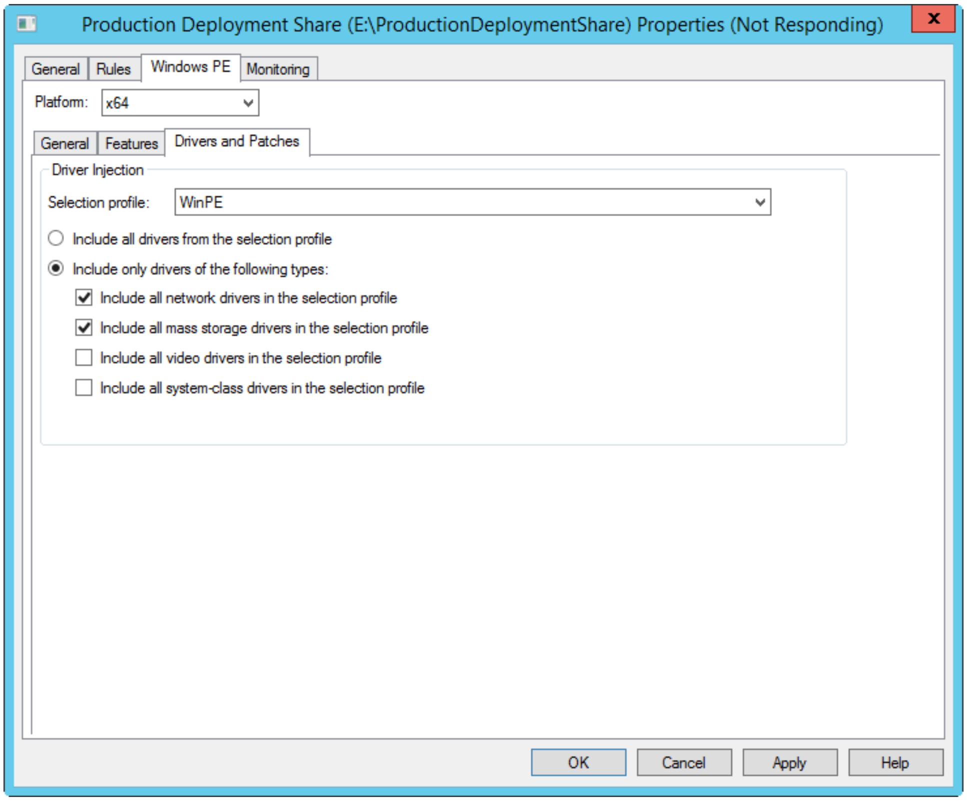
Select the folders that should be included in this selection profile.

```
⊟ □ DS001:\
   ⊞ □ Applications
   ⊞ □ Operating Systems
   ⊟ □ Out-of-Box Drivers
        ☑ WinPE
      ⊞ □ Windows 8.1 x64
   ⊞ □ Packages
   ⊞ □ Task Sequences
```

Figure 3.20: WinPE Folder Selected In Selection Profile.

- **Summary** – Confirm the specified options and click **Next**.
- **Progress** – A progress bar will be displayed as the selection profile is created.
- **Confirmation** – Confirmation of the successful selection profile creation will be displayed here. Click **Finish**.

5. Right-click the deployment share and select **Properties** and perform these actions:
   - Select the **Windows PE** tab.
   - Select **x64** from the **Platform** drop down menu, as shown in Figure 3.21.
   - Select the **Drivers and Patches** tab.
   - Select **WinPE** from the **Selection profile** drop down menu shown in Figure 3.21.



Production Deployment Share (E:\ProductionDeploymentShare) Properties (Not Responding)

Platform: x64

Driver Injection

Selection profile: WinPE

○ Include all drivers from the selection profile

● Include only drivers of the following types:

☑ Include all network drivers in the selection profile

☑ Include all mass storage drivers in the selection profile

□ Include all video drivers in the selection profile

□ Include all system-class drivers in the selection profile

Figure 3.21: Windows PE Selection Profile.

- Click **OK** to apply the changes and close the window.

Note: Repeat step 5 for the x86 platform if you are using boot media for 32 bit systems.

Importing Drivers for Windows 8.1

Now that the drivers are configured for the boot media to enable Surface Pro 3 devices to launch the deployment process from network boot, the drivers for the operating system need to be supplied. As with WinPE, it is beneficial to organize the drivers used for different operating systems and models. This helps to avoid conflict where different models may use different versions of the same driver that are incompatible with one another. Selection profiles will be used to specify the operating system and the model used.

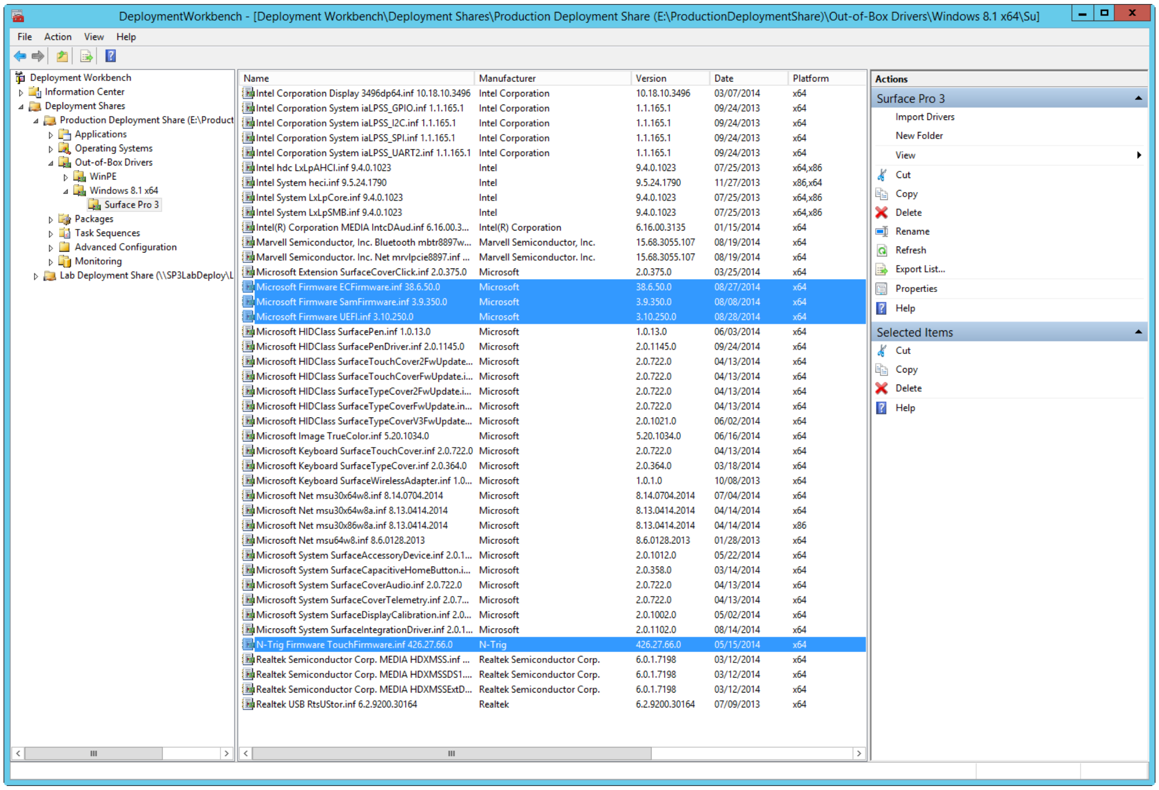
To import the drivers for the operating system, follow these steps:

1. Open **File Explorer** and navigate to the download location for the Surface Pro 3 drivers.
2. Extract the Surface Pro 3 collection and Surface Pro 3 Pen ZIP archives to a folder on the production deployment server.
3. Open the MDT **Deployment Workbench**.
4. Expand the deployment share tree and select the **Out-of-Box Drivers** folder.
5. Select the **New Folder** option from the **Actions** pane to launch the **New Folder** dialog box.
6. The **New Folder** dialog box presents the following options:
    - **General Settings** – Specify the name **Windows 8.1 x64** and any desired comments and then click **Next**.
    - **Summary** – Confirm the specified options and click **Next**.
    - **Progress** – A progress bar will be displayed as the folder is created.

- **Confirmation** – Confirmation of the successful creation of the folder will be displayed here. Click **Finish**.

7. Select the **Windows 8.1 x64** folder.
8. Select the **New Folder** option from the **Actions** pane to launch the **New Folder** dialog box.
9. The **New Folder** dialog box presents the following options:
   - **General Settings** – Specify the name **Surface Pro 3** and any desired comments and then click **Next**.
   - **Summary** – Confirm the specified options and click **Next**.
   - **Progress** – A progress bar will be displayed as the folder is created.
   - **Confirmation** – Confirmation of the successful creation of the folder will be displayed here. Click **Finish**.
10. Select the newly created **Surface Pro 3** folder.
11. Select the **Import Drivers** option from the **Actions** pane to launch the **Import Driver Wizard**.
12. The **Import Driver Wizard** presents the following options:
    - **Specify Directory** – Enter or browse to the folder in which the extracted drivers, including the Surface Ethernet adapters, the Surface Pro 3 collection, and the Surface Pro 3 Pen driver, are located, then click **Next**.
    - **Summary** – Confirm the specified options and click **Next**.
    - **Progress** – A progress bar will be displayed as the drivers are imported.
    - **Confirmation** – Confirmation of the successful import of the drivers will be displayed here. Click **Finish**.

All of the drivers provided by the driver and firmware pack downloads should now appear inside the **Surface Pro 3** folder. This includes the drivers that provide firmware updates to Surface Pro 3, as shown in Figure 3.22. These drivers will be injected into the deployment image as part of the deployment task sequence and therefore will be preinstalled in the image that is written to Surface Pro 3. When the firmware drivers are written to the Surface Pro 3 device for the first time, as part of the image, the firmware updates will be applied when the computer is restarted. This restart occurs automatically as a part of the deployment process.



Name	Manufacturer	Version	Date	Platform
Intel Corporation Display 3496dp64.inf 10.18.10.3496	Intel Corporation	10.18.10.3496	03/07/2014	x64
Intel Corporation System iaLPSS_GPIO.inf 1.1.165.1	Intel Corporation	1.1.165.1	09/24/2013	x64
Intel Corporation System iaLPSS_I2C.inf 1.1.165.1	Intel Corporation	1.1.165.1	09/24/2013	x64
Intel Corporation System iaLPSS_SPI.inf 1.1.165.1	Intel Corporation	1.1.165.1	09/24/2013	x64
Intel Corporation System iaLPSS_UART2.inf 1.1.165.1	Intel Corporation	1.1.165.1	09/24/2013	x64
Intel hdc LxLpAHCI.inf 9.4.0.1023	Intel	9.4.0.1023	07/25/2013	x64,x86
Intel System heci.inf 9.5.24.1790	Intel	9.5.24.1790	11/27/2013	x86,x64
Intel System LxLpCore.inf 9.4.0.1023	Intel	9.4.0.1023	07/25/2013	x64,x86
Intel System LxLpSMB.inf 9.4.0.1023	Intel	9.4.0.1023	07/25/2013	x64,x86
Intel(R) Corporation MEDIA IntcDAud.inf 6.16.00.3...	Intel(R) Corporation	6.16.00.3135	01/15/2014	x64
Marvell Semiconductor, Inc. Bluetooth mbtr8897w...	Marvell Semiconductor, Inc.	15.68.3055.107	08/19/2014	x64
Marvell Semiconductor. Inc. Net mrvlpcie8897.inf ...	Marvell Semiconductor. Inc.	15.68.3055.107	08/19/2014	x64
Microsoft Extension SurfaceCoverClick.inf 2.0.375.0	Microsoft	2.0.375.0	03/25/2014	x64
Microsoft Firmware ECFirmware.inf 38.6.50.0	Microsoft	38.6.50.0	08/27/2014	x64
Microsoft Firmware SamFirmware.inf 3.9.350.0	Microsoft	3.9.350.0	08/08/2014	x64
Microsoft Firmware UEFI.inf 3.10.250.0	Microsoft	3.10.250.0	08/28/2014	x64
Microsoft HIDClass SurfacePen.inf 1.0.13.0	Microsoft	1.0.13.0	06/03/2014	x64
Microsoft HIDClass SurfacePenDriver.inf 2.0.1145.0	Microsoft	2.0.1145.0	09/24/2014	x64
Microsoft HIDClass SurfaceTouchCover2FwUpdate...	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft HIDClass SurfaceTouchCoverFwUpdate.i...	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft HIDClass SurfaceTypeCover2FwUpdate.i...	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft HIDClass SurfaceTypeCoverFwUpdate.in...	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft HIDClass SurfaceTypeCoverV3FwUpdate...	Microsoft	2.0.1021.0	06/02/2014	x64
Microsoft Image TrueColor.inf 5.20.1034.0	Microsoft	5.20.1034.0	06/16/2014	x64
Microsoft Keyboard SurfaceTouchCover.inf 2.0.722.0	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft Keyboard SurfaceTypeCover.inf 2.0.364.0	Microsoft	2.0.364.0	03/18/2014	x64
Microsoft Keyboard SurfaceWirelessAdapter.inf 1.0...	Microsoft	1.0.1.0	10/08/2013	x64
Microsoft Net msu30x64w8.inf 8.14.0704.2014	Microsoft	8.14.0704.2014	07/04/2014	x64
Microsoft Net msu30x64w8a.inf 8.13.0414.2014	Microsoft	8.13.0414.2014	04/14/2014	x64
Microsoft Net msu30x86w8a.inf 8.13.0414.2014	Microsoft	8.13.0414.2014	04/14/2014	x86
Microsoft Net msu64w8.inf 8.6.0128.2013	Microsoft	8.6.0128.2013	01/28/2013	x64
Microsoft System SurfaceAccessoryDevice.inf 2.0.1...	Microsoft	2.0.1012.0	05/22/2014	x64
Microsoft System SurfaceCapacitiveHomeButton.i...	Microsoft	2.0.358.0	03/14/2014	x64
Microsoft System SurfaceCoverAudio.inf 2.0.722.0	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft System SurfaceCoverTelemetry.inf 2.0.7...	Microsoft	2.0.722.0	04/13/2014	x64
Microsoft System SurfaceDisplayCalibration.inf 2.0...	Microsoft	2.0.1002.0	05/02/2014	x64
Microsoft System SurfaceIntegrationDriver.inf 2.0.1...	Microsoft	2.0.1102.0	08/14/2014	x64
N-Trig Firmware TouchFirmware.inf 426.27.66.0	N-Trig	426.27.66.0	05/15/2014	x64
Realtek Semiconductor Corp. MEDIA HDXMSS.inf ...	Realtek Semiconductor Corp.	6.0.1.7198	03/12/2014	x64
Realtek Semiconductor Corp. MEDIA HDXMSSDS1....	Realtek Semiconductor Corp.	6.0.1.7198	03/12/2014	x64
Realtek Semiconductor Corp. MEDIA HDXMSSExtD...	Realtek Semiconductor Corp.	6.0.1.7198	03/12/2014	x64
Realtek USB RtsUStor.inf 6.2.9200.30164	Realtek	6.2.9200.30164	07/09/2013	x64

Figure 3.22: Deployment Share Showing Surface Pro 3 Firmware Drivers.

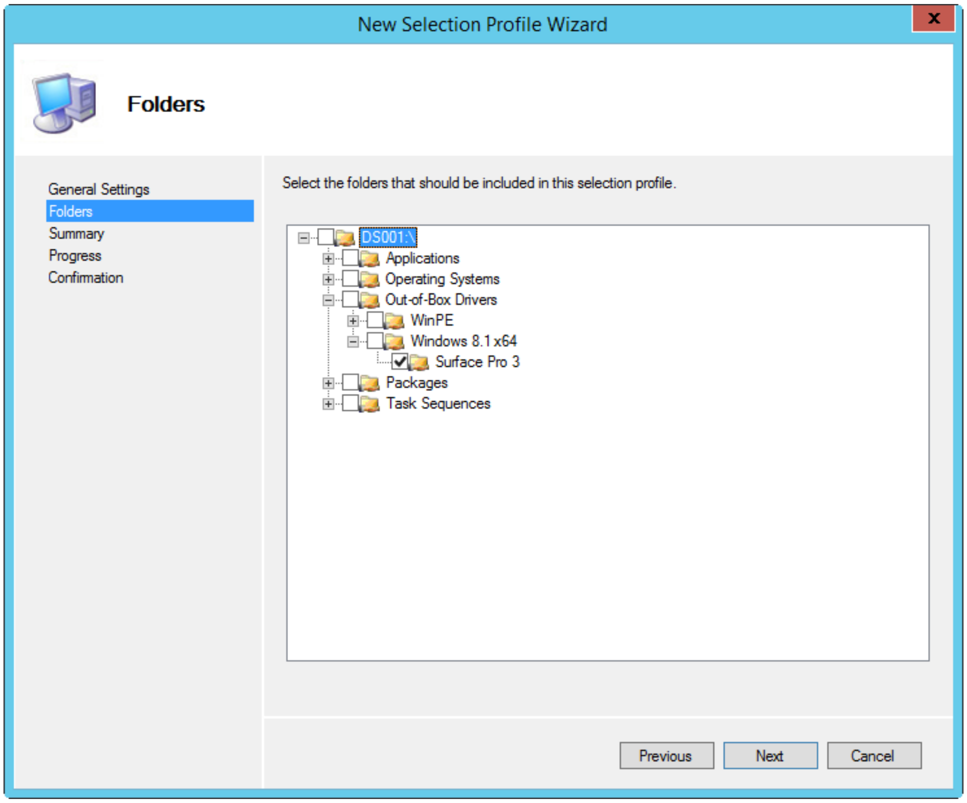
Creating the Surface Pro 3 Win 8.1 x64 Selection Profile

In a production deployment share with multiple makes and models of computers, there may incompatible drivers available. You need to ensure that only Surface Pro 3 drivers are deployed to Surface Pro 3 devices. The mechanism to specify which drivers are to be deployed to specific computers is to configure another selection profile, by following these steps:

1. Expand the **Advanced Configuration** folder of the deployment share.
2. Select the **Selection Profiles** folder.
3. Select **New Selection Profile** from the **Actions** pane to launch the **New Selection Profile Wizard**.
4. The **New Selection Profile Wizard** shows the following options:
    - **General Settings** – Specify the name **Surface Pro 3 Win 8.1 x64** for the selection profile and any desired comments, then click **Next**.

      > **Note**: Though the Surface Pro 3 supports only Windows 8.1 Update 64 bit, it is recommended to include the operating system and architecture in all model selection profile names to allow for separate selection profiles for each model, operating system, and architecture.

    - **Folders** – Expand the deployment share tree, the **Out-of-Box Drivers** folder, and the **Windows 8.1 x64** subfolder, and then check the box next to the **Surface Pro 3** folder as shown in Figure 3.23.



Select the folders that should be included in this selection profile.

- □ DS001:\
  - □ Applications
  - □ Operating Systems
  - □ Out-of-Box Drivers
    - □ WinPE
    - □ Windows 8.1 x64
      - ☑ Surface Pro 3
  - □ Packages
  - □ Task Sequences

Figure 3.23: Windows 8.1 x64 Folder Selected In Selection Profile.

- **Summary** – Confirm the specified options and click **Next**.
- **Progress** – A progress bar will be displayed as the selection profile is created.
- **Confirmation** – Confirmation of the successful selection profile creation will be displayed here. Click **Finish**.

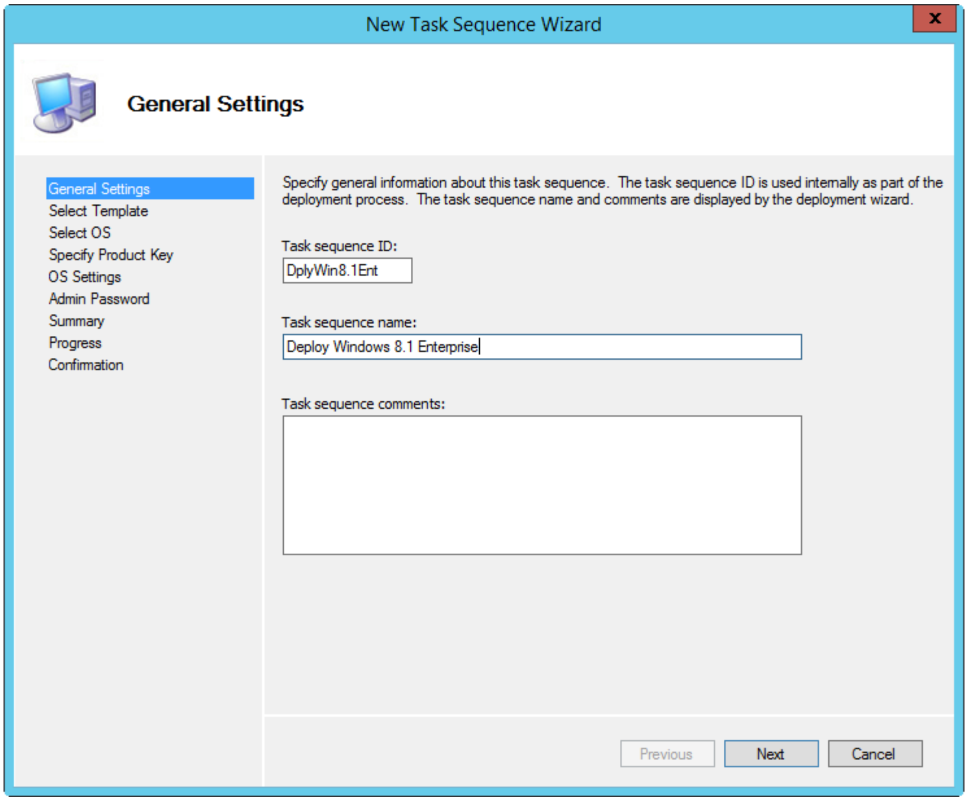
Creating the Task Sequence

You have now installed the deployment tools, created a deployment share, and imported operating system files and drivers. All required components are configured and you are ready to begin configuring how the deployment will be performed. The deployment process is controlled through task sequences. For more details about task sequences, refer to the Task Sequences section of Chapter 2.

Creating the Deployment Task Sequence

Task sequences are configured in the MDT Deployment Workbench. For this scenario, you will create a basic task sequence that deploys the imported operating system to the target Surface Pro 3 device. You create a task sequence by following these steps:

1. In the MDT Deployment Workbench, expand the deployment share.
2. Right-click **Task Sequences** and click **New Task Sequence**. This launches the **New Task Sequence Wizard**, as shown in Figure 3.24.



Specify general information about this task sequence. The task sequence ID is used internally as part of the deployment process. The task sequence name and comments are displayed by the deployment wizard.

Task sequence ID: DplyWin8.1Ent

Task sequence name: Deploy Windows 8.1 Enterprise

Task sequence comments:

Figure 3.24: New Task Sequence Wizard.

3. The **New Task Sequence Wizard** presents a series of steps, as follows:
   - **General Settings** – Enter the **Task sequence ID** and **Task sequence name**. These fields are used to uniquely differentiate this task sequence from others in the deployment share. For example, a task sequence to deploy Windows 8.1 Update Enterprise, you can enter a **Task sequence ID** of **DplyWin8.1Ent** and a **Task sequence name** of **Deploy Windows 8.1 Update Enterprise**. Click **Next**.

     Note: The Task sequence ID field only allows for 16 characters with no spaces.
   - **Select Template** – Select **Standard Client Task Sequence** from the dropdown list of predefined templates. For more information about the additional templates, refer to Chapter 2. Click **Next**.
   - **Select OS** – Select the imported operating system from the list. Click **Next**.
   - **Specify Product Key** – Ensure the **Do not specific a product key at this time** option is selected. For this scenario, the product key will be entered at the time of deployment. Click **Next**.
   - **OS Settings** – Enables you to configure the following basic operating system settings, then click **Next**:
     - **Full Name** – Enter full name you'll use to register the operating system. This field is required.
     - **Organization** – Enter the name of your organization you'll use to register the operating system. This field is required.
     - **Internet Explorer Home Page** – Enter the URL of the home page that comes up when Internet Explorer is launched. This field is required.
   - **Admin Password** – Enter a strong password for the local **Administrator** account. Click **Next**.
   - **Summary** – Review the summary of your new task sequence and click **Next**.
   - **Progress** – Displays a progress bar during the creation of the new task sequence.

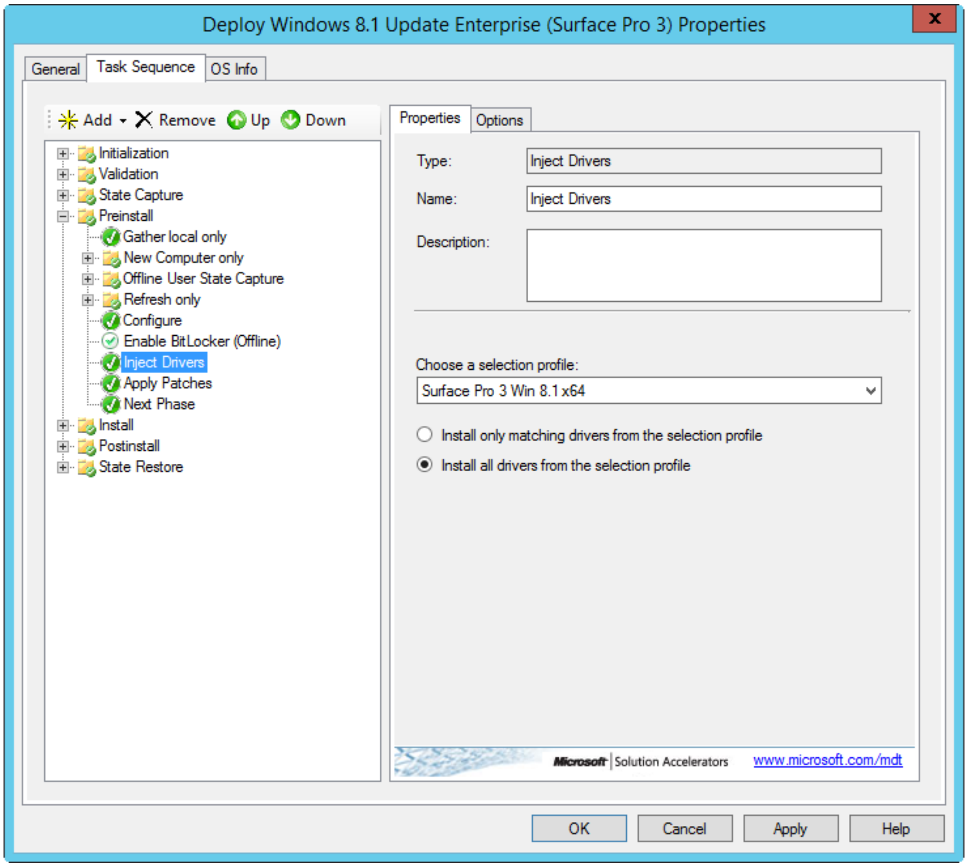
- **Confirmation** – Displays confirmation of success or errors generated while creating the task sequence. Click **Finish** to close the **New Task Sequence Wizard**.

Configuring Driver Selection

To configure the task sequence to use the selection profile, follow these steps:

1. Right-click the production deployment task sequence and select **Properties**.
2. Select the **Task Sequence** tab.
3. Expand the **Preinstall** folder and select the **Inject Drivers** step as shown in Figure 3.25.
4. Select the selection profile that you created for Surface Pro 3 from the **Chose a selection profile:** drop down menu as shown in Figure 3.25.
5. Change the option from **Install only matching drivers from the selection profile** to **Install all drivers from the selection profile** as shown in Figure 3.25.

> **Note:** This will force all drivers selected in the selection profile to be installed, even if the PnP signature is not available on the system. This is important for Surface devices because some components are not visible until drivers for other components are installed.


Deploy Windows 8.1 Update Enterprise (Surface Pro 3) Properties

Type: Inject Drivers

Name: Inject Drivers

Description:

Choose a selection profile: Surface Pro 3 Win 8.1 x64

○ Install only matching drivers from the selection profile

● Install all drivers from the selection profile

Figure 3.25: Inject Drivers Step with Selection Profile Configuration.

Note: Specifying the selection profile in the deployment task sequence will make the task sequence applicable to Surface Pro 3 only. Selection profiles can also be specified with model specific deployment share rules. See the Customizing Rules for Automation section of Chapter 5.

Preparing Boot Media

Preparing boot media is comprised of two separate steps, each of which is described in this chapter:

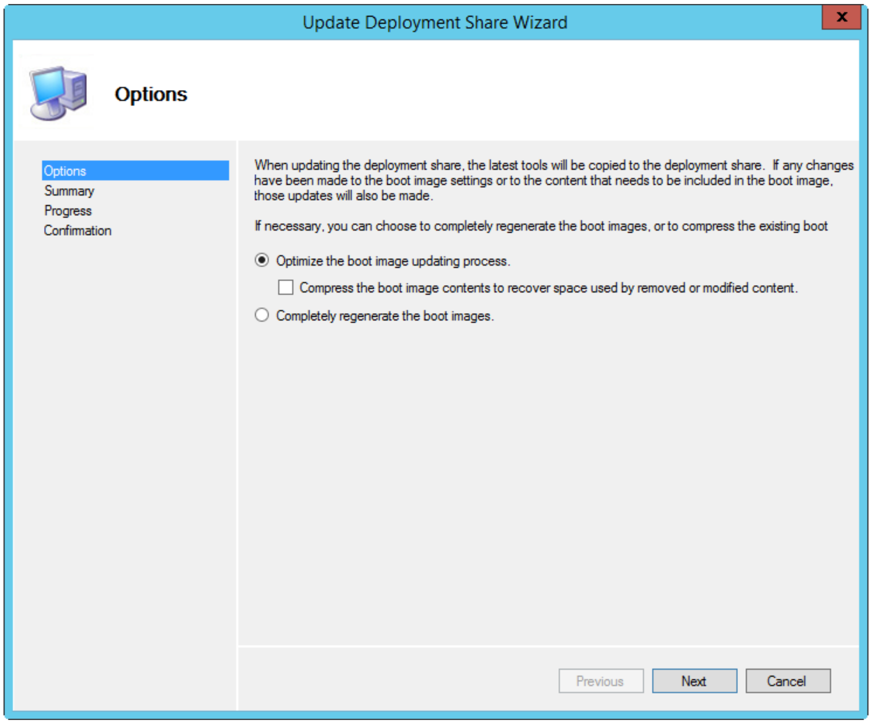
- **Generating boot media** – creates the media that the target deployment computer boots from.
- **Configuring network boot** – configures the environment that enables the boot media to read the deployment share on the deployment server.

The concept of boot media is described in more detail in Chapter 2.

Generating Boot Media

After the task sequence is created, you need to generate the boot media to be used on the Surface Pro 3 device that will connect to the deployment share (including access to the task sequence and source files). To generate boot media, follow these steps:

1. In the MDT Deployment Workbench, expand the deployment share.
2. Right-click the name of your deployment share and click **Update Deployment Share**. This launches the **Update Deployment Share Wizard**, as shown in Figure 3.26.



When updating the deployment share, the latest tools will be copied to the deployment share. If any changes have been made to the boot image settings or to the content that needs to be included in the boot image, those updates will also be made.

If necessary, you can choose to completely regenerate the boot images, or to compress the existing boot

● Optimize the boot image updating process.

□ Compress the boot image contents to recover space used by removed or modified content.

○ Completely regenerate the boot images.

Figure 3.26: Update Deployment Share Wizard.

3. The **Update Deployment Share Wizard** presents a series of steps, as follows:
   - **Options** – Enables you to select the desired option for updating the boot media. For this scenario, you can simply click **Next** because there is no boot image to update.
   - **Summary** – Review the summary of updating the deployment share and click **Next**.
   - **Progress** – Displays a progress bar of updating the deployment share.

     Note: Both 32-bit and a 64-bit boot images are created. By default, these images are named **LiteTouchPE_x86.wim** and **LiteTouchPE_x64.wim** respectively and are located in the **Boot** folder on the deployment share.
   - **Confirmation** – Displays confirmation of success or errors generated while updating the deployment share. Click **Finish** to close the **Update Deployment Share Wizard**.

Importing Boot Media into WDS

You have now installed and configured WDS for network (PXE) boot and created a basic deployment share to support this scenario. Now you need to add the previously created boot image into WDS to make it available to the PXE boot clients, such as a Surface Pro 3 device.

To import the boot image into WDS, follow these steps:

1. Launch the **Windows Deployment Services** console from the Start Screen under Administrative Tools on your deployment server.
2. Expand the name of your server in the **Servers** tree and right-click the **Boot Images** folder. Click **Add Boot Image**. This launches the **Add Image Wizard**.
3. The **Add Image Wizard** presents a series of steps, as follows:
   - **Image File** – Select the **LiteTouchPE_x64.wim** boot media image file you created earlier in this chapter. Click **Next**.
   - **Image Metadata** – Prompts you for the image name and description. For this scenario, accept the default values. Click **Next**.
   - **Summary** – Review the summary of the image to be imported and click **Next**.
   - **Task Progress** – Displays a progress bar during the importing of the boot image. Click **Finish** to close the **Add Image Wizard**.

After the boot image is imported, you'll see it listed in the **Boot Images** folder in WDS console, as shown in Figure 3.27.

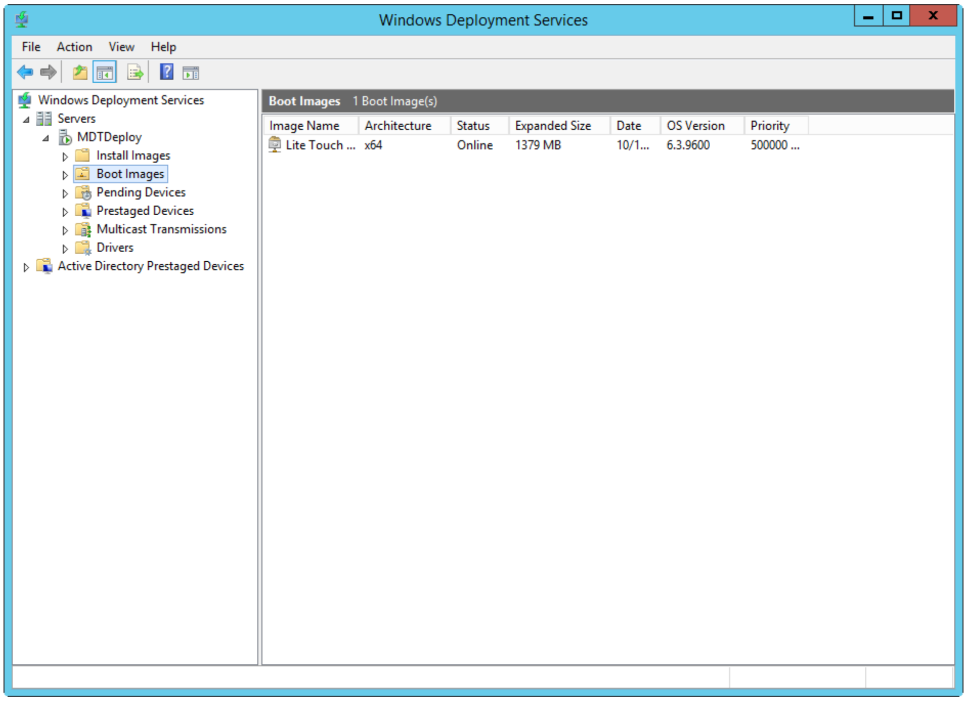


Image Name	Architecture	Status	Expanded Size	Date	OS Version	Priority
Lite Touch ...	x64	Online	1379 MB	10/1...	6.3.9600	500000 ...

Figure 3.27: WDS Console Showing Imported Boot Image.

Deploying the Basic Scenario

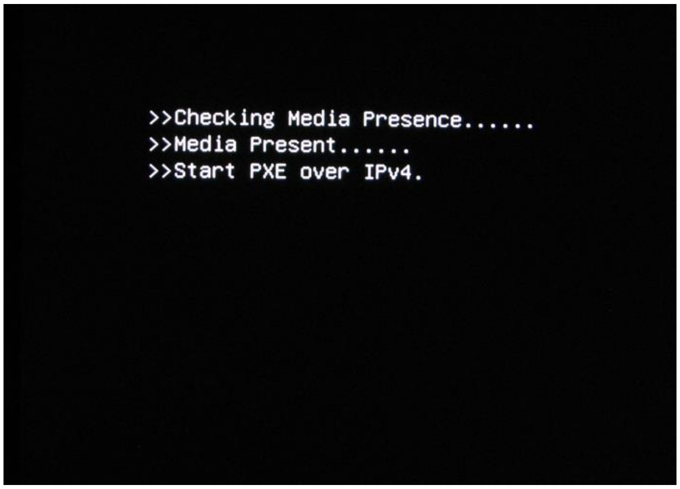
After creating the deployment share in MDT and configuring WDS, you are ready to deploy to the target Surface Pro 3 device. The deployment method is specific to the manual deployment scenario because it requires several prompts to be addressed on the target computer during the deployment process.

Booting from the Network

To deploy the prepared image to your Surface Pro 3 device, you will need to boot the device from the network. For Surface Pro 3 devices this can be done with a simple combination of buttons. To boot your Surface Pro 3 from the network, follow this procedure:

Note: Network booting with a Surface Pro 3 device requires either the Surface Ethernet Adapter or the Surface Pro 3 Docking Station. Other third party external network adapters are not supported for network boot.

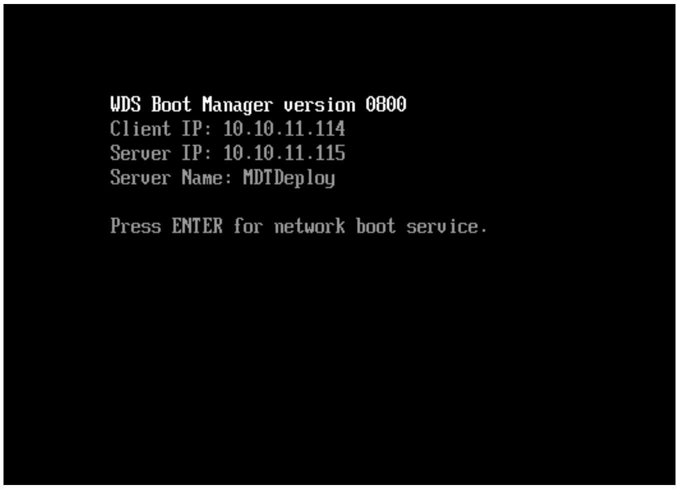
1. Connect the Surface Ethernet Adapter to the USB port or insert your Surface Pro 3 into the Surface Pro 3 Docking Station.
2. Power off the Surface Pro 3 device.
3. Press and hold the volume down button.
4. Press and release the power button.
5. Continue to hold the volume down button until the text **Checking Media Presence…** appears on the screen, as shown in Figure 3.28, indicating that network boot has begun. Once this text appears, the volume down button can be released.



```
>>Checking Media Presence......
>>Media Present......
>>Start PXE over IPv4.
```

Figure 3.28: Surface Pro 3 Device Booting from the Network.

6. The network adapter will receive an IP address from a DHCP server and after the WDS PXE service is detected, will prompt the user to press **ENTER** to begin the network boot process as shown in Figure 3.29.

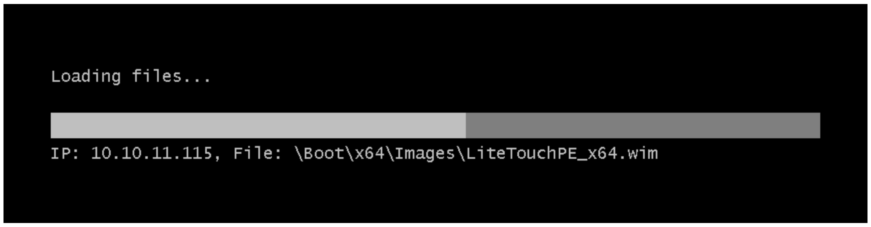


```
WDS Boot Manager version 0800
Client IP: 10.10.11.114
Server IP: 10.10.11.115
Server Name: MDTDeploy

Press ENTER for network boot service.
```

Figure 3.29: Confirmation of Successful Connection to WDS Server.

Note: In order to press the **Enter** key, the Surface Type Cover or a USB keyboard should be connected.

After the network boot process has been initiated, the boot image generated for the MDT deployment share (**LiteTouchPE_x64.wim**) will load. A progress bar appears along with the name of the loading image, as shown in Figure 3.30.



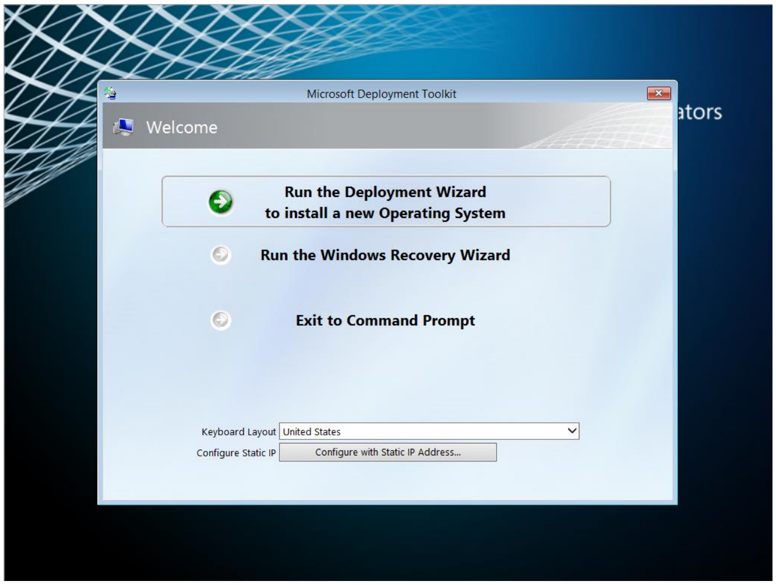
```
Loading files...

IP: 10.10.11.115, File: \Boot\x64\Images\LiteTouchPE_x64.wim
```

Figure 3.30: Network Boot Progress Bar.

Windows Deployment Wizard

After the boot image is loaded onto the target Surface Pro 3 device, the Microsoft Deployment Toolkit **Welcome Page** launches. You can start the **Windows Deployment Wizard** by following these steps:

1. Select the **Run the Deployment Wizard to install a new Operating System** option, as shown in Figure 3.31.


Microsoft Deployment Toolkit
Welcome
ators
Run the Deployment Wizard to install a new Operating System
Run the Windows Recovery Wizard
Exit to Command Prompt
Configure with Static IP Address...

Keyboard Layout United States
Configure Static IP

Figure 3.31: Microsoft Deployment Toolkit Welcome Page.

2. Enter credentials in these fields for access to the deployment share and click **OK**:
   - **User Name** – Enter the user name for an account that has a minimum permission level of Read. This field is required.
   - **Password** – Enter the password for the account. This field is required.
   - **Domain** – Enter the domain where the user account belongs. This field is required.

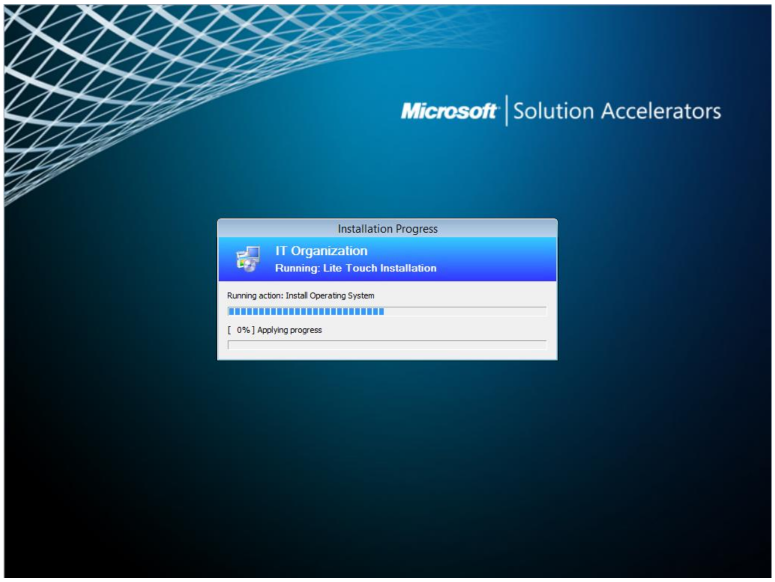
   Note: When using a standalone deployment server that is not connected to a domain, the name of the deployment server should be used to indicate that a local account is being used.

3. If the specified credentials are valid, the Windows Deployment Wizard launches. The Windows Deployment Wizard is used to initiate and control the deployment process on the target Surface Pro 3 devices by following a series of steps presented sequentially:
   - **Task Sequence** – Select the desired deployment task sequence that was created earlier in this chapter, then click **Next**.
   - **Computer Details** – Enter the desired name for the deployed computer and specify either a domain or workgroup to be joined. If selecting a domain, enter the credentials with permissions to join the domain. Click **Next**.
   - **Move Data and Settings** – Select the option to control how data and settings are managed, then click **Next**:
     - **Do not move user data and settings** – Indicates that user data and settings are overwritten. If you don't need any existing user data or settings while testing deployment with this scenario, click this option.

    - **Keep existing partitions** – Indicates that any existing partitions should be preserved and not formatted or partitioned.
    - **Move user data and settings** – Indicates user data and settings should be preserved.
- **User Data (Restore)** – Select the option to control whether user data should be restored with the following options, then click **Next**:
    - **Do not restore user data and settings** – No user data is restored from a network location or USMT backup. For testing a manual deployment, select this option.
    - **Specify a location** – Restores user data from a specified backup location.
- **Product Key** – Select the desired product key option, then click **Next**:
    - **No product key is required** – Select this option if your deployed operating system will use a KMS server for activation, or you are using evaluation software. This scenario uses evaluation software, so select this option.

      Note: If you are using a Windows 8.1 Professional image to be licensed using the embedded product key included with a Surface Pro 3 device (OA 3.0), no product key is required. More details about OA 3.0 are described in Chapter 2.
    - **Activate the machine with a multiple activation key (MAK)** – Select this option if your organization uses MAK keys, which are used for volume licensed operating systems.
    - **Use a specific product key** – Select this option if you have a single product key, such as one obtained from a retail box or from a preinstalled operating system.
- **Locale and Time** – Select the desired language and time zone settings from the following options, then click **Next**:
    - **Language to install** – Select your desired operating system language.
    - **Time and currency format** – Select your desired time and currency format.
    - **Keyboard layout** – Select your desired keyboard locale.
    - **Time zone** – Select your desired time zone.
- **Administrator Password** – Enter and confirm a strong password for the local **Administrator** account in the target Surface Pro 3 device, then click **Next**.
- **Capture Image** – Select the desired image capture settings from the following options, then click **Next**:
    - **Capture an image of this reference computer** – Captures an image when using a reference computer. This option is discussed further in Chapter 4.
    - **Sysprep this computer** – Generalizes the computer but does not capture an image.
    - **Prepare to capture the machine** – Only copies required Sysprep files.
    - **Do not capture an image of this computer** – Does not create any images from the target Surface Pro 3 device after deployment. Ensure this option is selected for testing the deployment of this scenario.
- **Ready** – A detailed summary of the selected options is provided under the **Details** button. Click **Begin** to initiate the deployment.

As shown in Figure 3.32, a progress bar is displayed to show the installation progress. The process runs without any further user interaction until the operating system is fully deployed.



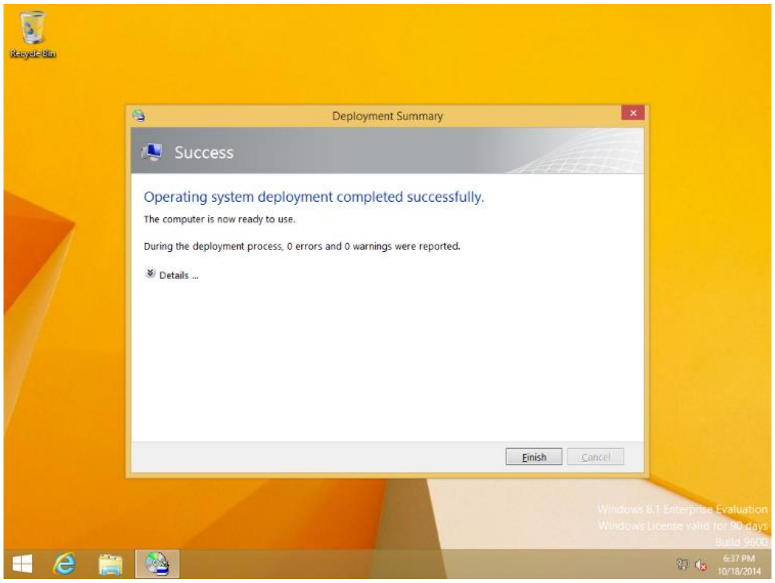
IT Organization
Running: Lite Touch Installation

Running action: Install Operating System

[0%] Applying progress

Figure 3.32: Installation Progress Bar.

At the completion of a successful deployment, a **Deployment Summary** page is displayed, as shown in Figure 3.33. After review, the **Deployment Summary** page can be closed and the computer and operating system are ready for use or further customization.



Operating system deployment completed successfully.

The computer is now ready to use.

During the deployment process, 0 errors and 0 warnings were reported.

Figure 3.33: Deployment Summary Page.

Note: The system is logged in using the local **Administrator** account specified in the Windows Deployment Wizard.

Chapter 4 – Reference Deployment with MDT

One of the most common deployment tasks required by an organization is the creation of custom images. Sector-based imaging tools, such as many third-party tools, have no mechanism to customize an image during the deployment process. On the other hand, file-based imaging tools, such as MDT, can provide customization at the time of deployment. However, some scenarios still may require a custom image, such as:

- **Deployment Performance** – Capturing an image from a reference system that already includes the latest updates or applications can consume less bandwidth and fewer system resources than having MDT manage those updates and applications at the time of deployment. For example, deploying an image with Windows Updates already installed can be much faster than having those updates injected as packages or having updates applied during the task sequence.
- **Customization** – Some customizations do not support automated deployment, such as apps that require user interaction in a GUI. Other customizations are performed only during image creation, such as the examples shown in the Customizations to the Reference Image section later in this chapter.
- **Deployment Scope** – Capturing an image from a reference system that already includes updates, applications, and drivers) can take far less time than having MDT manage updates, applications, and drivers at the time of deployment. For example, to include .NET framework in an image for deployment of limited scope it could be faster to download and install .NET framework on the reference computer before capturing an image than to download the files for installation, research the commands for silent installation, and import the application into MDT.

The reference deployment scenario in this chapter builds upon the manual deployment scenario discussed in Chapter 3. The reference deployment scenario increases the level of automation over the manual deployment scenario by introducing some customization.

The reference deployment scenario outlined in this chapter is applicable to organizations or businesses of any size and is often the next step towards more the more complex deployments described in Chapter 5 and Chapter 6.

The lab scenario used in this chapter is comprised of only one physical system: A Windows Server 2012 R2 environment configured with Hyper-V. The VMs hosted by the physical server are designated as the virtual lab for testing, planning, creation, and deployment of images. Hyper-V is configured with a virtual switch to allow connectivity between virtual machines and the local network and internet access.

The environment, as shown in Figure 4.1, is configured as follows:

- **Virtualization Host**:
  - Hyper-V (either server or client) to host two virtual machines
  - Virtual Switch (configured to provide network and internet access to virtual machines)

  Note: Machines connected to the virtual switch must be able to receive IP addresses from DHCP, a prerequisite for PXE network boot.

- **Virtual Machine (VM) 1:** Deployment Server
  - Windows Server 2012 R2
  - Windows Assessment and Deployment Kit (Windows ADK)
  - Microsoft Deployment Toolkit (MDT)
  - Windows Deployment Services (WDS)

Instructions for installation of the deployment tools are provided in Chapter 3.

- **Virtual Machine (VM) 2:** Reference System
  - Generation 1 Virtual Machine
  - Legacy network Adapter
  - No operating system installed
- **Virtual Machine (VM) 3:** Test System
  - Generation 1 Virtual Machine
  - Legacy network Adapter
  - No operating system installed

The conceptual process of capturing and deploying images is described in Chapter 2. For the reference deployment scenario outlined in this chapter, VM1 is responsible for deploying **install.wim** as a base image to VM2. You then customize the base image according to your needs. After customization, you capture the image from VM2 to VM1 and deploy it to VM3.

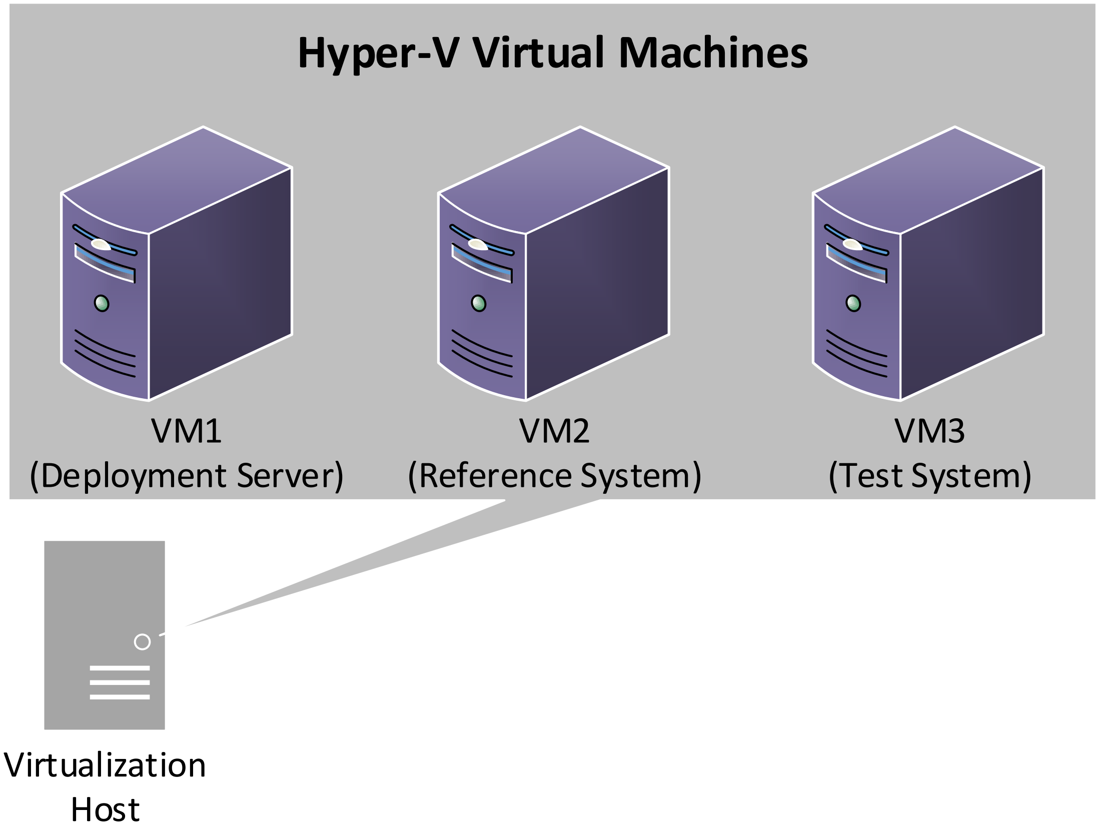


Figure 4.1: Overview of Lab Environment.

Note: It is recommended to use generation 1 virtual machines for image creation because the resulting images are compatible with a wider range of potential clients. To support PXE boot, generation 1 virtual machines must use a legacy network adapter.

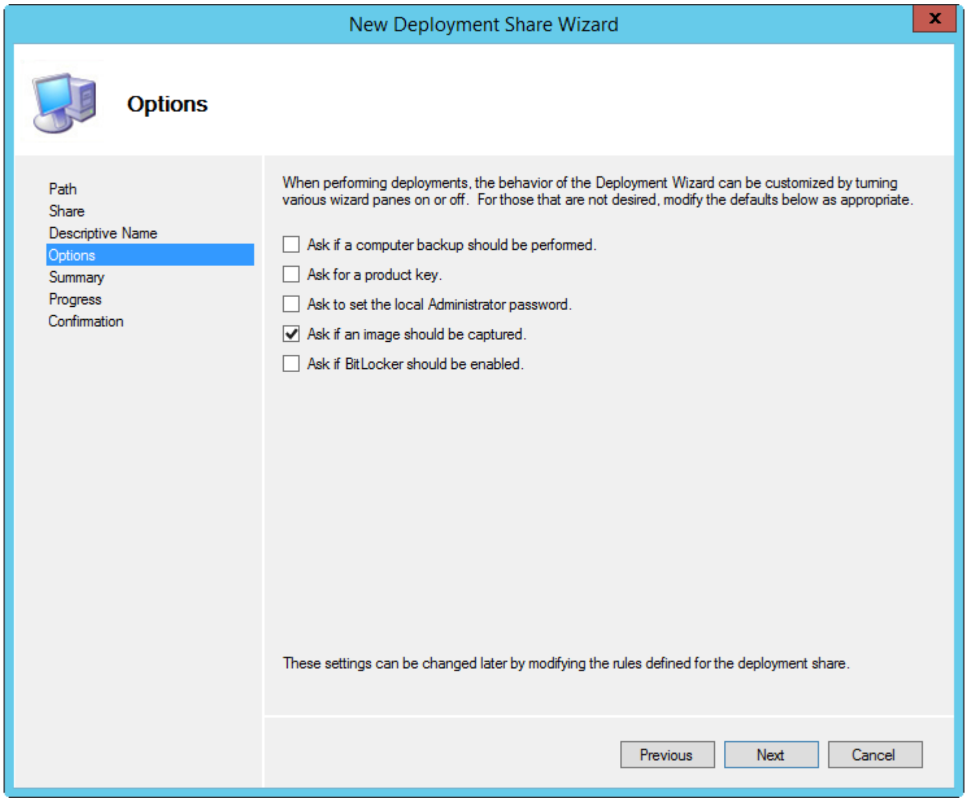
Configuring Deployment Share Rules

In Chapter 3, you learned how to create a new deployment share on the deployment server. If necessary, refer to Chapter 3 to learn how to navigate to and create the deployment share. During creation, a several options can be specified to control the behavior of the deployment process. These options result in the enabling and disabling of specific prompts presented to the user/technician by the Windows Deployment Wizard. In the reference deployment scenario, described herein, you'll learn how to configure the options to suppress some of the prompts, thereby reducing the amount of user interaction required from Chapter 3.

To suppress Windows Deployment Wizard prompts, follow this procedure:

1. Create a new deployment share by following the procedure you learned in the Creating a Deployment Share section of Chapter 3, but stop at the **Options** page.
2. In Chapter 3, you selected all options, which resulted in every possible prompt during deployment. In the reference deployment, some of those prompts are suppressed by unselecting these options, as shown in Figure 4.2:

    - **Ask if a computer backup should be performed** – This option can be unselected because no users or data (except for tests accounts) will exist.
    - **Ask for a product key** – This option can be unselected because the product key will be specified in the deployment task sequence.
    - **Ask to set the local Administrator password** – This option can be unselected because the password for the local **Administrator** account will be supplied in the task sequence.
    - **Ask if BitLocker should be enabled** – This option can be unselected because encryption is not required in a lab environment where no user data will exist on deployed systems.



When performing deployments, the behavior of the Deployment Wizard can be customized by turning various wizard panes on or off. For those that are not desired, modify the defaults below as appropriate.

☐ Ask if a computer backup should be performed.
☐ Ask for a product key.
☐ Ask to set the local Administrator password.
☑ Ask if an image should be captured.
☐ Ask if BitLocker should be enabled.

These settings can be changed later by modifying the rules defined for the deployment share.

Figure 4.2: New Deployment Share Options.

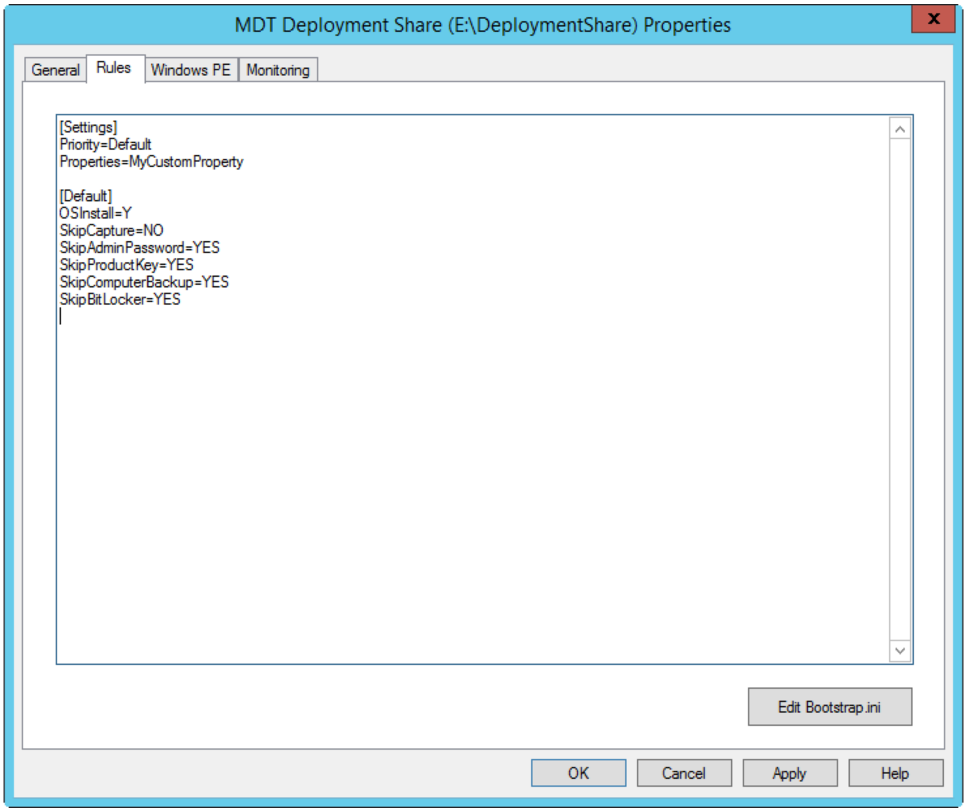
3. Continue clicking **Next** to complete and close the New Deployment Share Wizard as you did in Chapter 3.

Configuring Windows Deployment Wizard Rules

The values for the options on the deployment share **Options** page, shown in Figure 4.2, are specified as settings, known as *rules*. These rules are stored in a file named **customsettings.ini**. Each deployment share contains this file, so each can be configured differently. The five options on the page shown in Figure 4.2 are not the only options that can be configured, but additional options can only be configured by editing the **customsettings.ini** file.

To edit the **customsettings.ini** file, follow these steps:

1. Expand the **Deployment Share** tree in the **Deployment Workbench** and right-click the deployment share, and then click **Properties**.
2. Click the **Rules** tab. This brings up the screen shown in Figure 4.3.



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

[Default]
OSInstall=Y
SkipCapture=NO
SkipAdminPassword=YES
SkipProductKey=YES
SkipComputerBackup=YES
SkipBitLocker=YES
```

Figure 4.3: Original Deployment Share Rules.

Notice that the options in the **[Default]** section correspond to the options selected in the GUI screen in Figure 4.2.

3. Specify additional customizations by replacing the text shown in Figure 4.3 with the text shown in Listing 4.1.

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

[Default]
OSInstall=Y
SkipCapture=NO
SkipAdminPassword=YES
SkipProductKey=YES
SkipComputerBackup=YES
SkipBitLocker=YES
SkipBDDWelcome=YES
SkipUserData=YES
UserDataLocation=NONE
SkipDomainMembership=YES
JoinWorkgroup=WORKGROUP
SkipLocaleSelection=YES
KeyboardLocale=en-US
UserLocale=en-US
UILanguage=en-US
```

```
SkipTimeZone=YES
TimeZoneName=Pacific Standard Time
UserDomain=SP3DEPLOY
UserID=MDT
UserPassword=P@ssw0rd
SkipFinalSummary=YES
```

Listing 4.1: Specifying Additional Customizations in the customsettings.ini File.

Note: This guide does not outline every possible customization option in the customsettings.ini file. For more details about what can be customized and the values that can be specified, refer to the MDT Toolkit Reference, available in the MDT documentation. For more information about downloading MDT documentation, refer to the Installing Deployment Tools section of Chapter 3.

The additional settings specified in Listing 4.1 are:

- **SkipBDDWelcome** – Setting this value to **YES** bypasses the MDT **Welcome Page** when the Windows Deployment Wizard is launched.
- **SkipUserData** – Setting this value to **YES** bypasses the prompts to back up or restore user data.
- **UserDataLocation** – Setting this value to **NONE** instructs MDT that user data should not be backed up. For more information on backing up user data with this setting, see the Migrating User Data section of Chapter 8. This setting is required when specifying **YES** for the **SkipUserData** rule.
- **SkipDomainMembership** – This setting controls the prompts for domain or workgroup on the **Computer Details** page of the **Windows Deployment Wizard**. When set to **YES**, the setting **JoinWorkgroup** or **JoinDomain** must also be set to supply the information otherwise provided at the prompt.
- **SkipLocaleSelection** – This setting controls the localization and language prompts on the **Locale and Time** page of the **Windows Deployment Wizard**. When set to **YES**, the following settings must be configured to specify the information otherwise provided at the prompt:
  - **KeyboardLocale**
  - **UserLocale**
  - **UILanguage**
- **SkipTimeZone** – This setting controls the prompt for time zone. When both the **SkipTimeZone** and **SkipLocaleSelection** settings are set to **YES**, the **Locale and Time** page will be skipped. When set to **YES**, the desired time zone must be specified with the setting **TimeZoneName**.
- These settings are used to specify the credentials used by the **Windows Deployment Wizard** during deployment:
  - **UserDomain**
  - **UserID**
  - **UserPassword**
- **SkipFinalSummary** – This setting determines whether a final summary will be displayed upon deployment completion.

Note: The reference system, the computer that will be prepared with a base configuration before being captured to an image for deployment to other computers, should not be joined to a domain to ensure that no group policies are applied to the base environment. To ensure that systems deployed in the lab environment are not joined to the domain, the **JoinWorkgroup** setting must be specified in the deployment share rules.

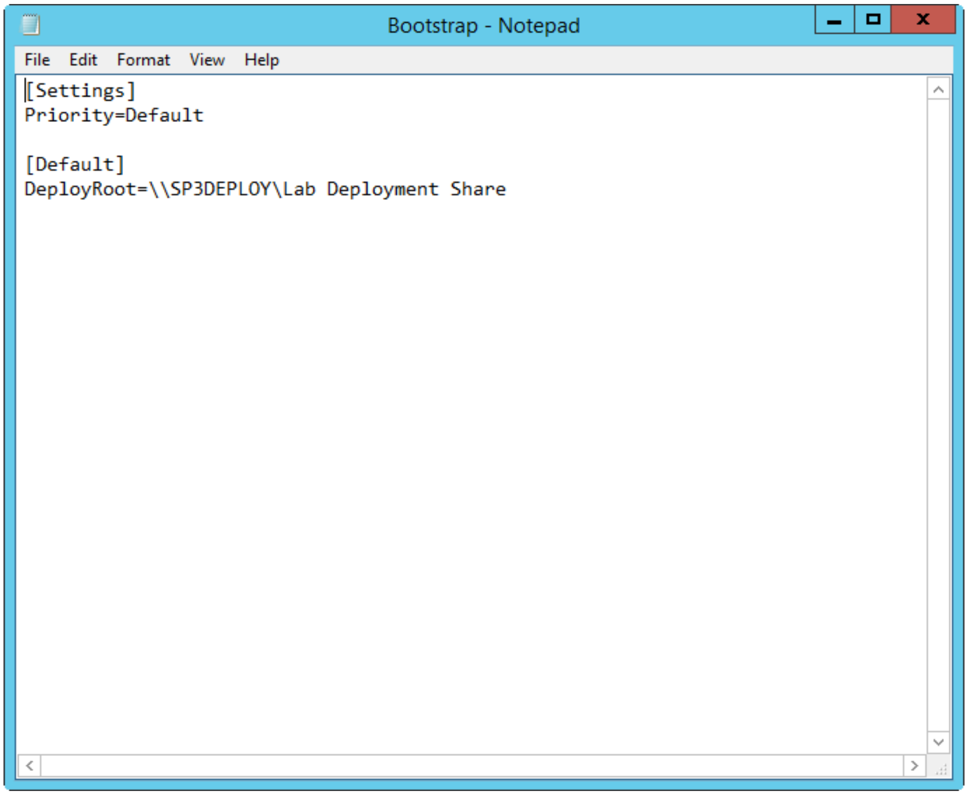
Configuring Boot Media Rules

In the same way that rules defined in **customsettings.ini** control the behavior of the **Windows Deployment Wizard**, rules defined in the file **bootstrap.ini** control the way the boot media for a deployment share behaves. The default behavior when booting to the MDT boot media is:

1. Before the **Windows Deployment Wizard** is launched, the MDT **Welcome Screen** is displayed and shows a **Run the Deployment Wizard to install a new Operating System** button.
2. Clicking the **Run the Deployment Wizard to install a new Operating System** button prompts the user to specify credentials for connectivity to the deployment share.

Configuring **bootstrap.ini** to instruct the **Windows Deployment Wizard** to launch without displaying the **Welcome Screen** and to bypass the prompts for credentials can performed with this procedure:

1. Expand the **Deployment Share** tree in the **Deployment Workbench** and right-click the deployment share, and then click **Properties**.
2. Click the **Rules** tab. This brings up the screen shown in Figure 4.3.
3. Select the **Edit Bootstrap.ini** button. This opens the **bootstrap.ini** file in **Notepad** as shown in Figure 4.4.



```
[Settings]
Priority=Default

[Default]
DeployRoot=\\SP3DEPLOY\Lab Deployment Share
```

Figure 4.4: Original Bootstrap.ini File Configuration.

4. Specify additional customizations by replacing the text shown in Figure 4.4 with the text shown in Listing 4.2.

```
[Settings]
Priority=Default
```

```
[Default]
DeployRoot=\\SP3DEPLOY\LabDeploymentShare
UserDomain=SP3DEPLOY
UserID=MDT
UserPassword=P@ssw0rd
SkipBDDWelcome=YES
```

Listing 4.2: Additional Rules in Bootstrap.ini.

The additional settings specified in Listing 4.2 are:

- **SkipBDDWelcome** – Setting this value to **YES** bypasses the MDT **Welcome Page** when the boot media is launched.
- These settings are used to specify the credentials used by the boot media to connect to the deployment share.
  - **UserDomain**
  - **UserID**
  - **UserPassword**

> **Note:** Credentials specified in the **bootstrap.ini** and **customsettings.ini** files are stored in plaintext on the MDT boot media. It is recommended to use a local user account dedicated to deployment processes that has read-only permissions to the deployment share.

After the deployment share is created and configured with the desired rules for automation, you then supply the installation files for the operating system. Import the source files for the operating system to be deployed to the reference system, which is detailed in the Importing an Operating System section in Chapter 3.

Creating a Reference Deployment Task Sequence

You have now configured the deployment share for automation and supplied source files for the operating system to be deployed to the reference system. Contrary to the manual deployment scenario discussed in Chapter 3, for the reference deployment scenario, the task sequence includes additional steps to automate the deployment and installation of Windows Updates. To create the reference deployment task sequence, begin by following the procedure shown in the Creating the Deployment Task Sequence section of Chapter 3, but then customize according to the instructions in this section.

> **Note:** Because the **SkipAdminPassword** rule is set to a value of **YES**, the user is not prompted for a password at the time of deployment, so it must be specified in the task sequence.

After the reference deployment task sequence is created, additional behaviors or customizations can be specified. To open the task sequence, expand the **Task Sequences** section of the deployment share and double-click the task sequence. The properties of a task sequence include these three tabs:

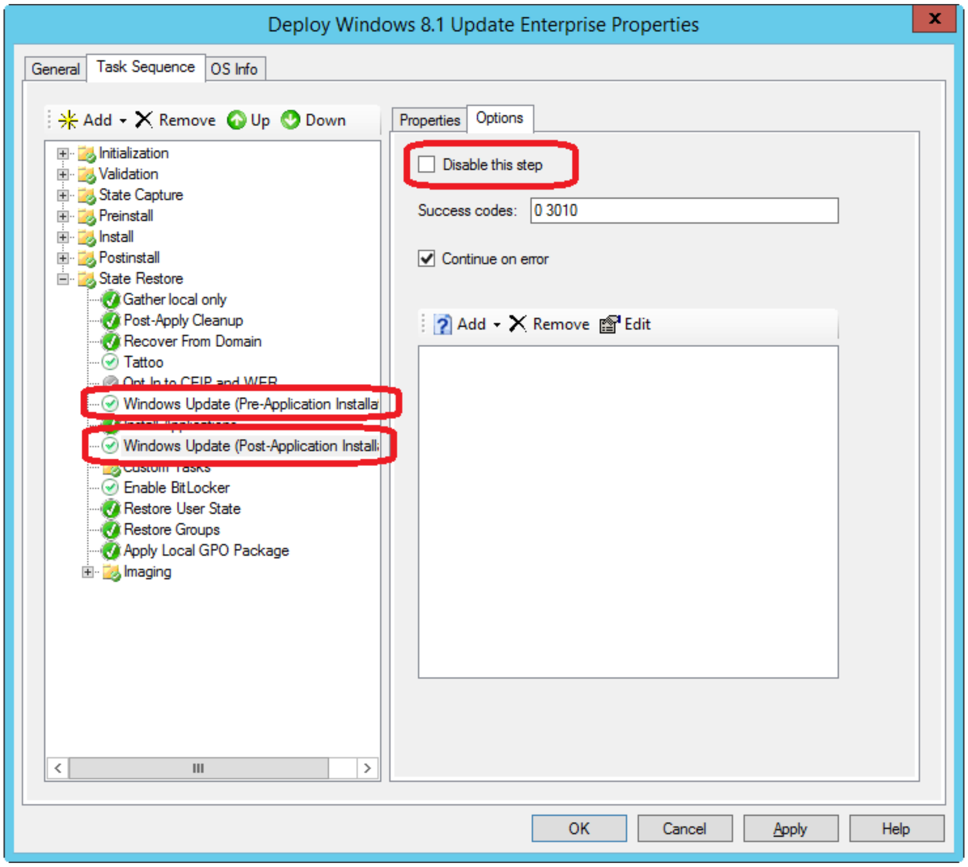
- **General** – Contains the name, comments, and target platforms of the task sequence. The task sequence can also be enabled or disabled from this tab.
- **Task Sequence** – Contains the steps to be performed by the task sequence.

- **OS Info** – Contains information regarding the operating system used by the task sequence and a button to edit the answer file that is used by the task sequence.

Enabling Windows Updates

To instruct the deployment process to run Windows Updates, follow this procedure:

1. *Expand the lab deployment share in the **Deployment Share** tree in the **Deployment Workbench** and click the **Task Sequences** folder.*
2. Right-click the reference deployment task sequence created earlier in this chapter.
3. Click **Properties**.
4. Select the **Task Sequence** tab.
5. Expand the **State Restore** folder.
6. Select the **Windows Update (Pre-Application Installation)** step.
7. Select the **Options** tab for the selected step as shown in Figure 4.5.



□ Disable this step

Success codes: 0 3010

☑ Continue on error

Figure 4.5: Windows Update Step Enabled.

8. Uncheck the **Disable this step** checkbox.
9. Select the **Windows Update (Post-Application Installation)** step.
10. Select the **Options** tab for the selected step.
11. Uncheck the **Disable this step** check box.
12. Click **OK** to save and close the task sequence properties.

Note: Enabling Windows Update during deployment will significantly increase the time required to perform the deployment task sequence. The increase in time is dependent on how many updates must be installed.

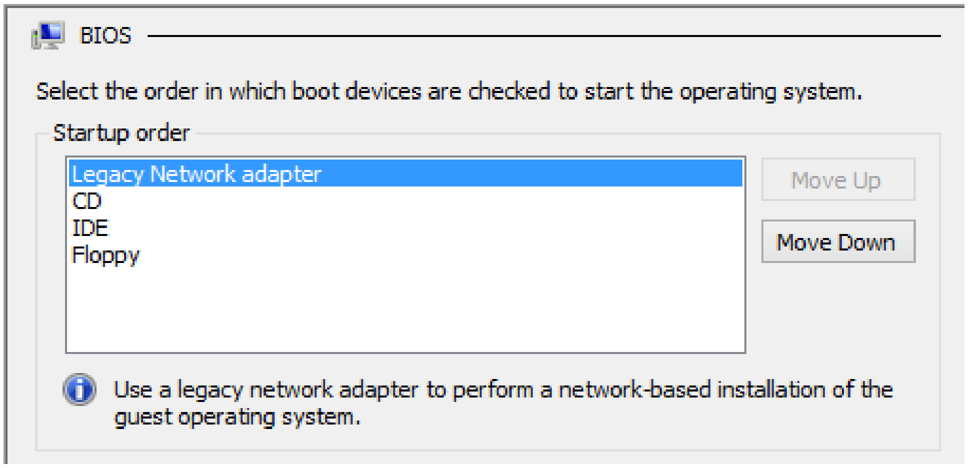
The task sequence is now configured to install Windows Updates on the reference system.

Deploying to the Reference System

Network boot is required to deploy to the reference system. See Chapter 3 for a complete walkthrough of configuring WDS for network boot, generating boot media, and importing boot media for use with WDS. These steps are required before proceeding.

To deploy an image to the reference system, follow these steps:

1. Verify the boot order is configured to boot from the network as the first priority in the settings of the Hyper-V virtual machine as shown in Figure 4.6:



BIOS

Select the order in which boot devices are checked to start the operating system.

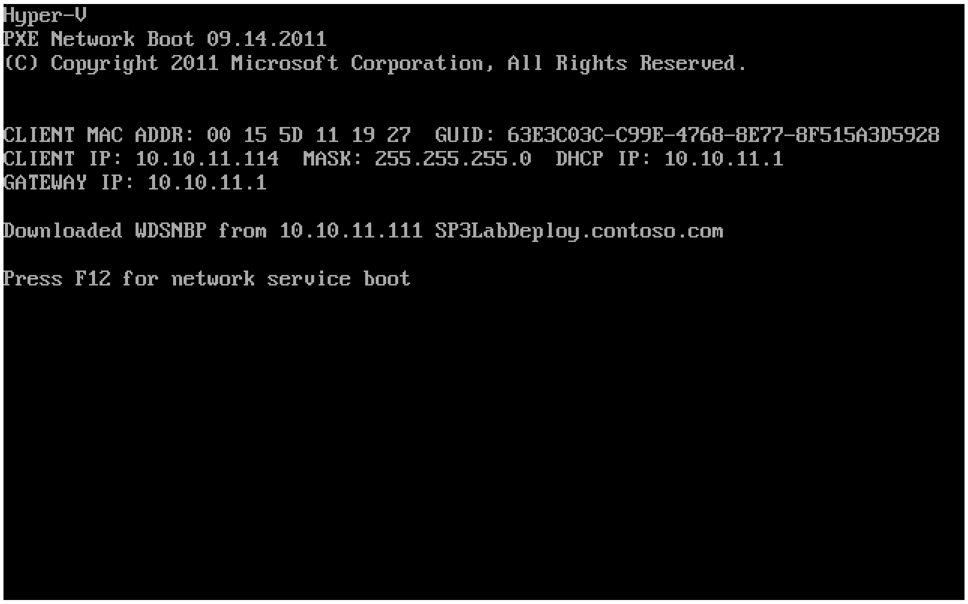
Startup order

Legacy Network adapter
CD
IDE
Floppy

Use a legacy network adapter to perform a network-based installation of the guest operating system.

Figure 4.6: Boot Priority in Hyper-V Virtual Machine Settings.

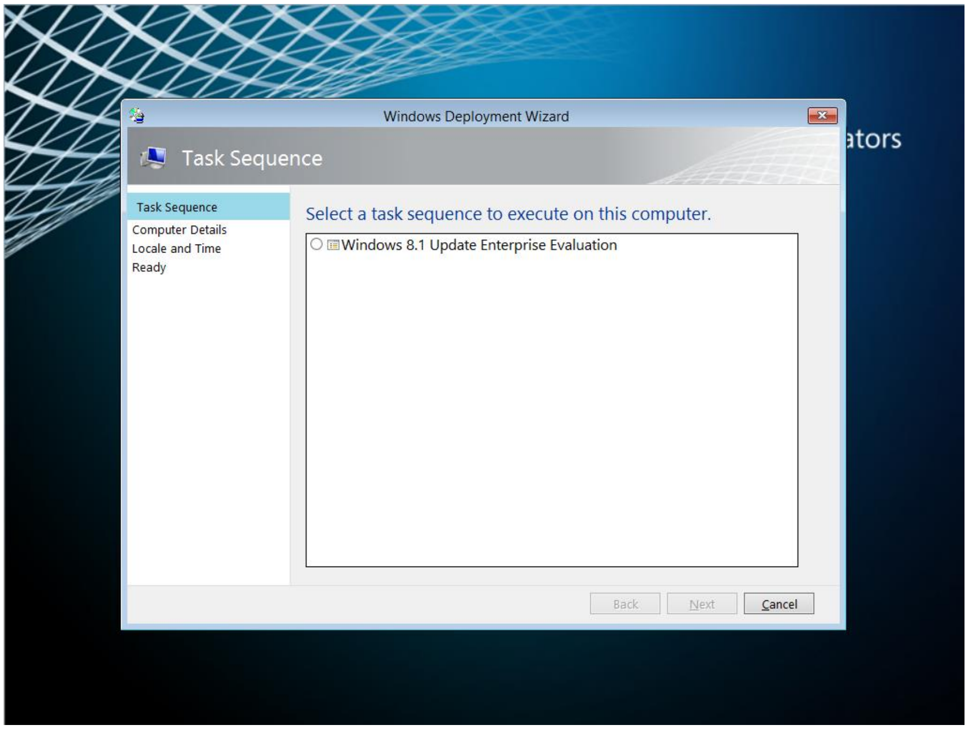
2. In Hyper-V, start VM2, which is a blank virtual machine. The adapter will receive an IP address from the DHCP server and then contact the PXE server.
3. After the PXE server is found, the PXE boot screen is displayed, as shown in Figure 4.7.



```
Hyper-V
PXE Network Boot 09.14.2011
(C) Copyright 2011 Microsoft Corporation, All Rights Reserved.


CLIENT MAC ADDR: 00 15 5D 11 19 27  GUID: 63E3C03C-C99E-4768-8E77-8F515A3D5928
CLIENT IP: 10.10.11.114  MASK: 255.255.255.0  DHCP IP: 10.10.11.1
GATEWAY IP: 10.10.11.1

Downloaded WDSNBP from 10.10.11.111 SP3LabDeploy.contoso.com

Press F12 for network service boot
```

Figure 4.7: WDS PXE Boot Screen.

4. Press **Enter** to boot from the network. This launches the MDT boot media and processes the **bootstrap.ini** and **customsettings.ini** configuration files. You'll notice a progress bar on the screen.
5. The **Task Sequence** page is displayed. Select the reference deployment task sequence created earlier in this chapter, as shown in Figure 4.8. Click **Next**.

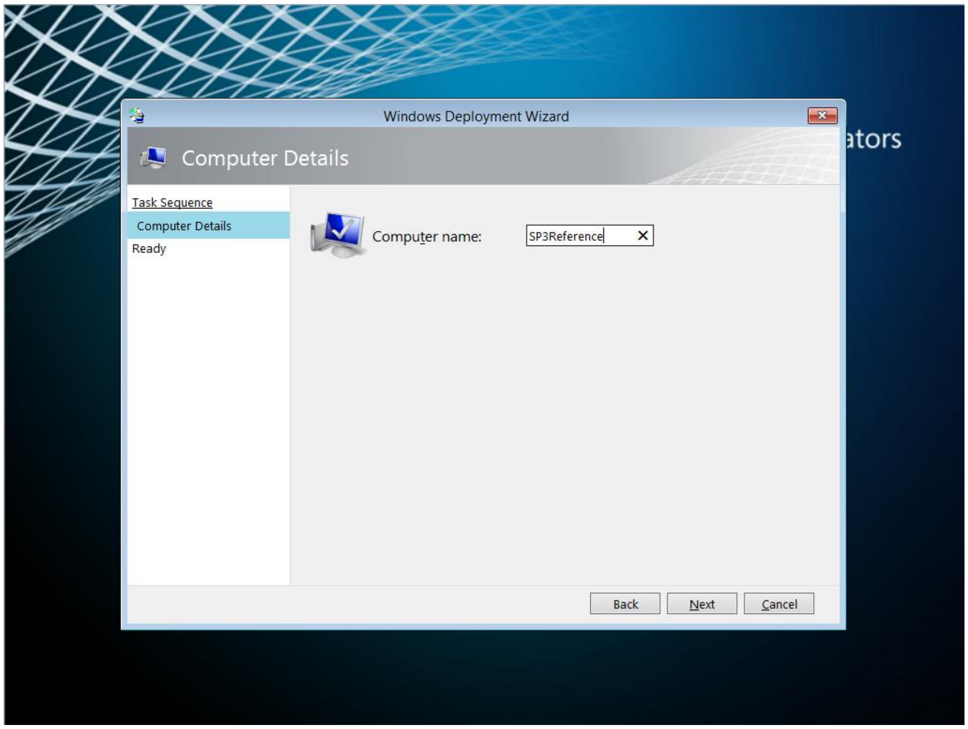


Select a task sequence to execute on this computer.

○ Windows 8.1 Update Enterprise Evaluation

Figure 4.8: Selecting the Task Sequence.

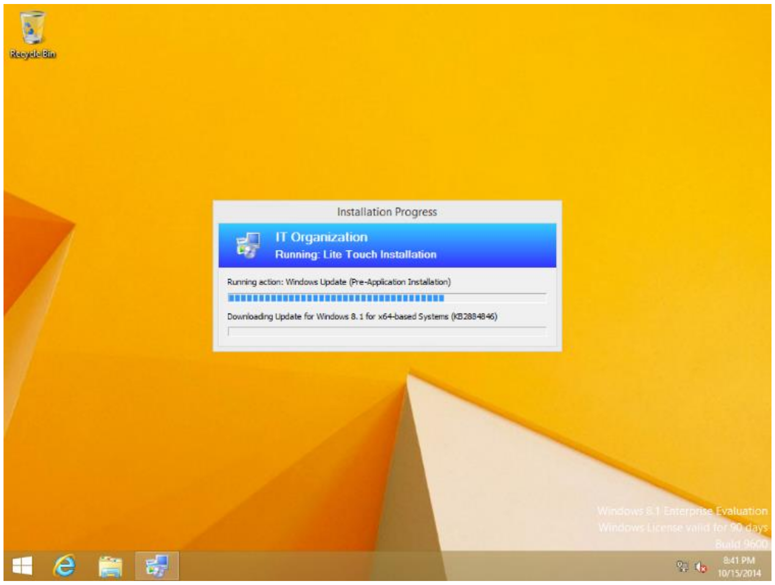
6. Enter the desired computer name on the **Computer Details** page as shown in Figure 4.9 and click **Next**.



Computer name: SP3Reference

Figure 4.9: Entering the Computer Name.

The **Installation Progress** window appears to show the progress of the deployment. The deployment process will write the image to the reference computer and automatically manage the installation of Windows Updates, as shown in Figure 4.10.


Recycle Bin
Installation Progress
IT Organization
Running: Lite Touch Installation
Windows 8.1 Enterprise Evaluation
Windows License valid for 90 days
Build 9600
8:41 PM
10/15/2014

Running action: Windows Update (Pre-Application Installation)

Downloading Update for Windows 8.1 for x64-based Systems (KB2884846)

Figure 4.10: Progress of Windows Updates Installation.

When complete, the **Windows Deployment Wizard** will close automatically and the system will be logged in as the **Administrator** account with the password supplied during task sequence creation. The reference system is now ready for application installation, customization, and tweaking before it is captured back to the deployment share as an image.

Customizations to the Reference Image

Before an image of the reference system is captured for deployment to other computers, it can be customized in a number of ways. Any changes or settings made to the reference system will be captured in the resulting image and therefore will be included on any deployed computers using that image. Examples of changes to a reference system include installed applications, changed settings, or any data placed on the system.

Customizing the experience for all new users on a computer that uses a deployed image follows this overall procedure, which is described in more detail throughout the rest of this chapter:

1. Make desired changes to the reference system while being logged in as the **Administrator** account.
2. Capture the image.
3. Deploy the image, specifying the **CopyProfile** setting, which copies the customized changes made to the **Administrator** profile to the default profile. The default profile is used as a baseline for users logging into a computer for the first time.

   Note: The **CopyProfile** setting must be configured in the deployment task sequence, not the capture task sequence. The **CopyProfile** setting is processed in the **Specialize** pass, during deployment.
4. During deployment, the **Administrator** account is automatically deleted.

This section shows how to customize the reference system to include:

- Customization of the wallpaper
- Customization of the default user account picture
- Removal of Windows Store apps
- Customization of the Start Screen

Note: As any changes to the system are recorded in the image, it is highly recommended to clean up any temporary files, application installers, and empty the recycle bin before capturing.

Customizing the Wallpaper

To customize the wallpaper of the reference system, follow these steps:

1. Place the desired wallpaper image in the **C:\Windows\Web\Wallpaper** folder on the reference system. This will make the wallpaper available in the **Windows Desktop Backgrounds** picture location. This example uses the Microsoft Surface wallpaper, as shown in Figure 4.11, which is located in the **C:\Windows\Web\Wallpaper\Surface** folder in the unaltered Surface Pro 3 installation of Windows 8.1 Professional.
2. Right-click the desktop and select **Personalize** to launch the **Personalization** control panel applet.
3. Click **Desktop Background**, then select the desired wallpaper(s) and click **Save Changes**.
4. Select the **Save Theme** option under **My Themes** and assign the desired name for the theme.
5. Close the **Personalization** control panel applet.

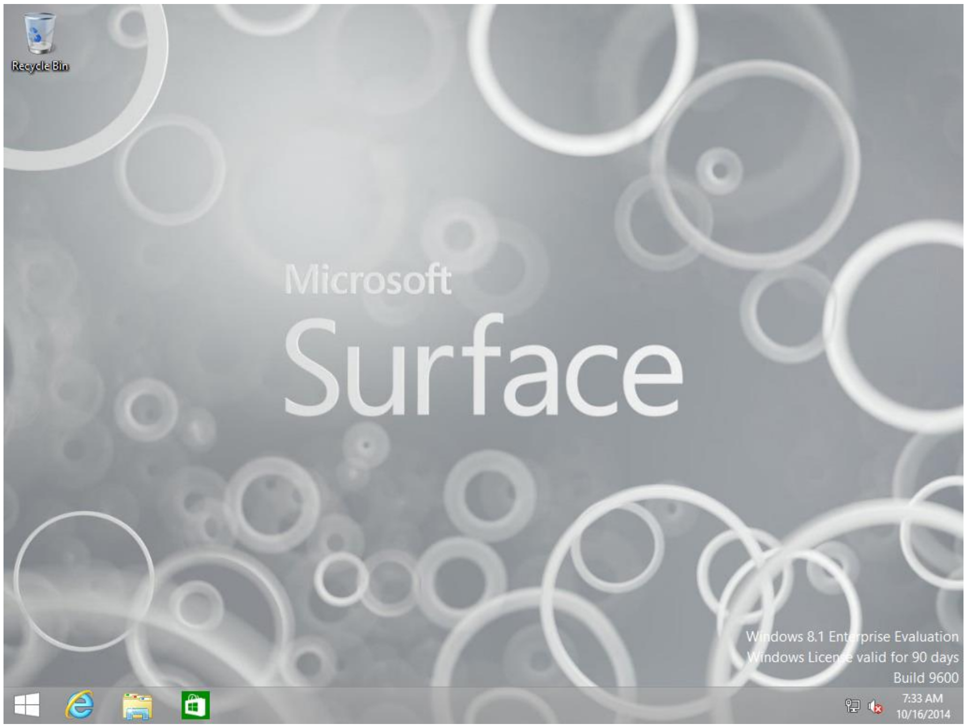

Recycle Bin
Microsoft
Surface
Windows 8.1 Enterprise Evaluation
Windows License valid for 90 days
Build 9600
7:33 AM
10/16/2014

Figure 4.11: Configured Microsoft Surface Wallpaper.

Customizing the Default User Account Picture

The default user account picture is used as the default picture for each new account created on a computer, unless the user changes it. The default user account picture is not configured as a component of the user profile, but as a separate set of images stored in the **C:\ProgramData\Microsoft\User Account Pictures** folder. To customize the default user account picture, follow these steps:

1. Open File Explorer.
2. Enter **C:\ProgramData\Microsoft\User Account Pictures** in the address bar. The full path must be entered because the **ProgramData** folder is hidden by default and cannot be selected or browsed without enabling display of hidden files and folders. This shows the default screen in Figure 4.12 before image replacement.

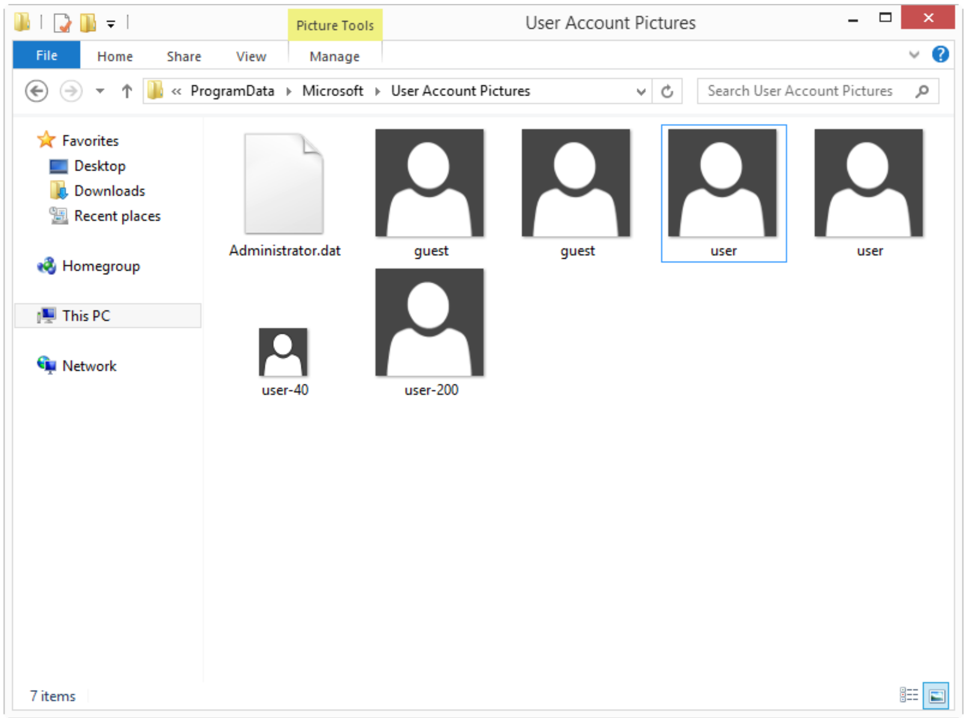


Figure 4.12: User Account Picture Before Replacement.

3. For the default user account, these four images must be provided in the specified format and size:
    - user.bmp (448x448 pixels)
    - user.png (448x448 pixels)
    - user-40.png (40x40 pixels)
    - user-200.png (200x200 pixels)
4. Replace all four image files with your desired customized image, as shown in Figure 4.13.

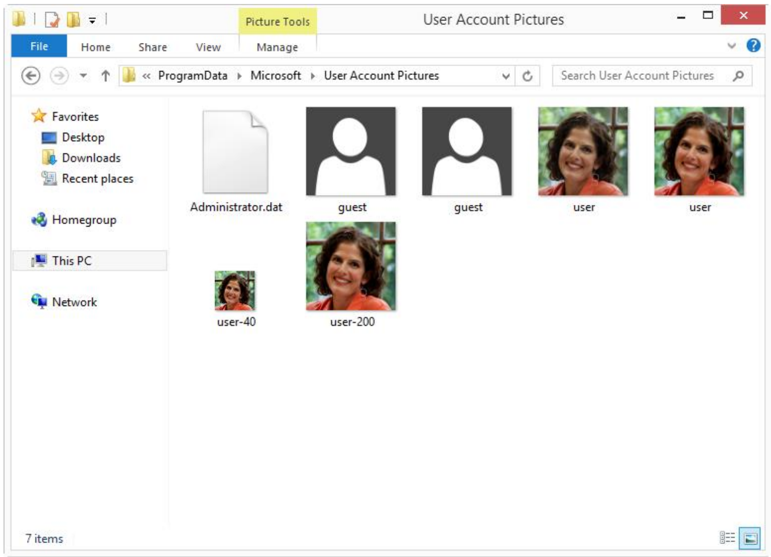


Figure 4.13: User Account Picture After Replacement.

5. When prompted to **Replace or Skip Files**, select **Replace the files in the destination**.
6. When the **Destination Folder Access Denied** dialog box appears, check the **Do this for all current items** checkbox to provide administrator permission to copy files to the folder and click **Continue**.
7. Close File Explorer. After customization, the default user account picture is shown in Figure 4.14.

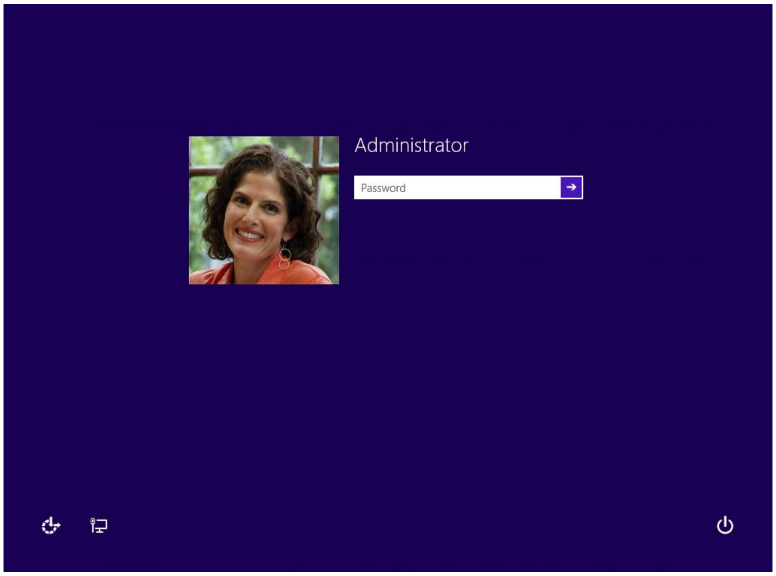


Figure 4.14: Customized User Account Picture.

Customizing Windows Store Apps

It is important to understand the relationship between the provisioned apps and installed apps. A *provisioned* app is staged in the image and will be installed at the first logon for each user. An app is *installed* for a specific user. When a user updates an app or installs an app from the Windows Store, it becomes installed only for that user. Therefore, there becomes a mismatch between the user's installed app and the staged provisioned app.

For example, when an app is uninstalled for a user, it will still be installed for any new users on that computer. This is because the app is still provisioned. If an app is unprovisioned it will not be installed for new users on the computer, but it will remain installed for any users who had already installed the app. When an app is installed from the Windows Store, it is installed only for that individual user but not provisioned for new users.

Windows Store apps cannot be updated during the customization of a reference system. Updating these apps including the built in apps such as Mail, Calendar, or News will cause Sysprep to fail. This is because when apps are updated, the updated version is installed only for the user. This breaks the association with the provisioned app, which is available for all users of the computer.

To completely remove a Windows Store app from the image, it must be removed for both the user (uninstalled) and the computer (un-provisioned). This is because Windows Store apps can exist in a state where they are available for all users of a computer even when they are not installed for a specific user, or they can exist for a specific user, but not all users of the computer.

To begin, refer to Figure 4.15 to see what the Start Screen looks like before customization.

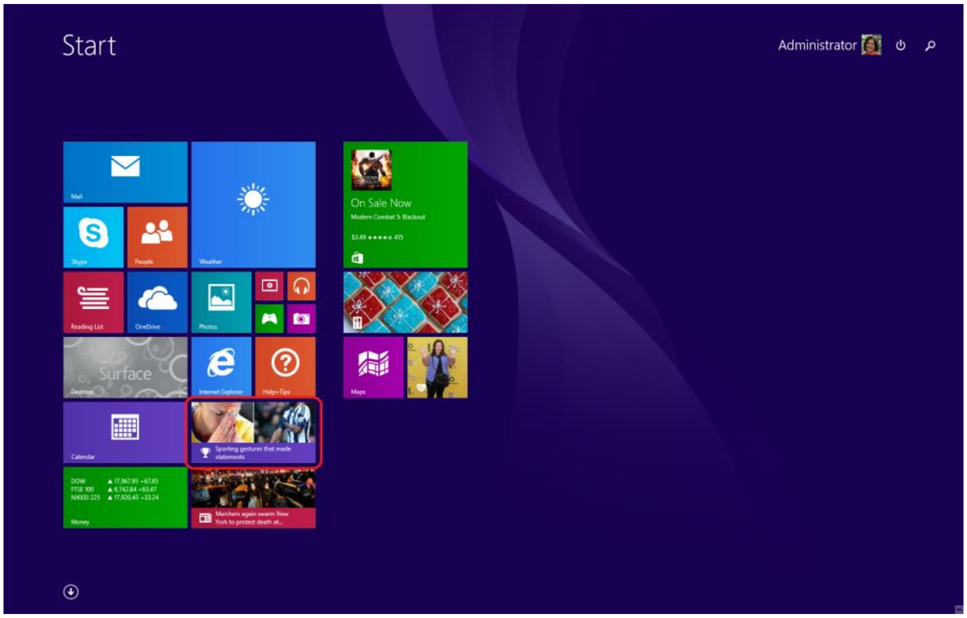
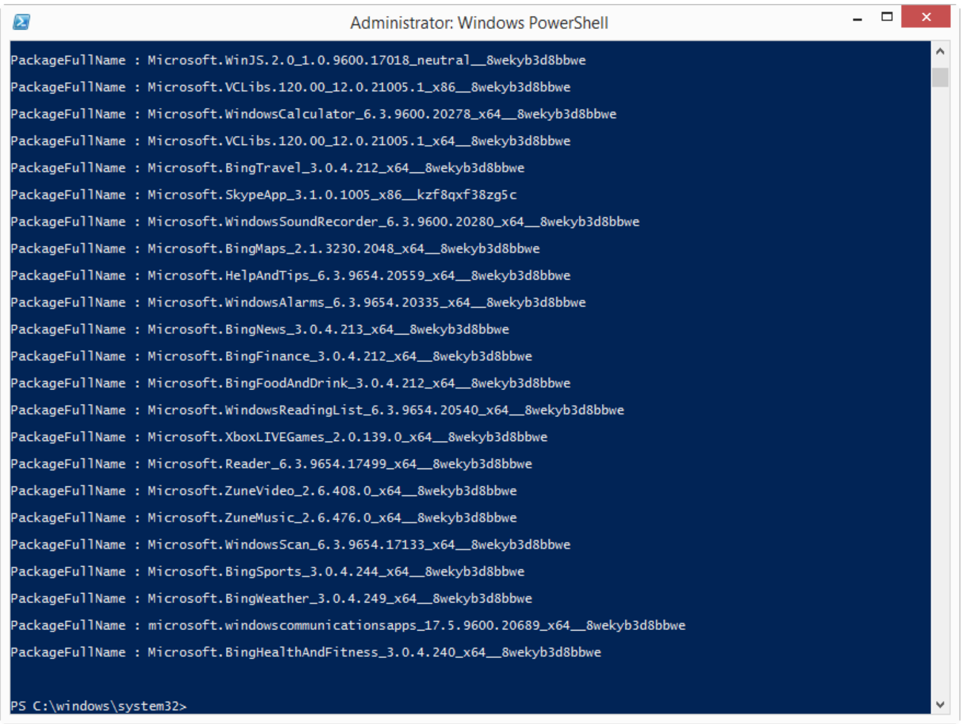


Figure 4.15: Start Screen Before Customization.

As an example, this procedure shows you to uninstall and un-provision the **Sports** app, but the same procedure works for any other Windows Store app as well:

1. Open an Administrative PowerShell session.
2. Get a list of packages that are installed for specific users on the computer by executing the **get-appxpackage** cmdlet with this statement:
   ```
   get-appxpackage –alluser | format-list -property packagefullname
   ```
   You will see a list of all apps that are currently installed, as shown in Figure 4.16.



```
PackageFullName : Microsoft.WinJS.2.0_1.0.9600.17018_neutral__8wekyb3d8bbwe
PackageFullName : Microsoft.VCLibs.120.00_12.0.21005.1_x86__8wekyb3d8bbwe
PackageFullName : Microsoft.WindowsCalculator_6.3.9600.20278_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.VCLibs.120.00_12.0.21005.1_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingTravel_3.0.4.212_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.SkypeApp_3.1.0.1005_x86__kzf8qxf38zg5c
PackageFullName : Microsoft.WindowsSoundRecorder_6.3.9600.20280_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingMaps_2.1.3230.2048_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.HelpAndTips_6.3.9654.20559_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.WindowsAlarms_6.3.9654.20335_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingNews_3.0.4.213_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingFinance_3.0.4.212_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingFoodAndDrink_3.0.4.212_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.WindowsReadingList_6.3.9654.20540_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.XboxLIVEGames_2.0.139.0_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.Reader_6.3.9654.17499_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.ZuneVideo_2.6.408.0_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.ZuneMusic_2.6.476.0_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.WindowsScan_6.3.9654.17133_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingSports_3.0.4.244_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingWeather_3.0.4.249_x64__8wekyb3d8bbwe
PackageFullName : microsoft.windowscommunicationsapps_17.5.9600.20689_x64__8wekyb3d8bbwe
PackageFullName : Microsoft.BingHealthAndFitness_3.0.4.240_x64__8wekyb3d8bbwe


PS C:\windows\system32>
```

Figure 4.16: Get-AppxPackage Output.

Note: The output from this statement can be written to a text file to make it easier to reference, search, or copy from. This is done by adding > c:\report.txt to the end of the statement. For example:

```
get-appxpackage -alluser | format-list -property packagefullname >
c:\users\administrator\desktop\installedappx.txt
```

3. If you scroll through the list of returned apps, you'll see **Microsoft.BingSports_3.0.4.212_x64__8wekyb3d8bbwe** in the list. You'll need this exact name to supply as an argument to the PowerShell cmdlet to remove the app in the next step.
4. Uninstall the undesired apps by executing the **remove-appxpackage** cmdlet with this statement:
   ```
   remove-appxpackage Microsoft.BingSports_3.0.4.212_x64__8wekyb3d8bbwe
   ```
5. Get a list of packages that are provisioned in on the computer by executing the **get-appxprovisionedpackage** cmdlet with this statement:
   ```
   get-appxprovisionedpackage -online | format-list -property packagename
   ```

   You will see a list of all apps that are currently provisioned.
6. If you scroll through the list of returned apps, you'll see **Microsoft.BingSports_2014.926.258.4003_neutral_~_8wekyb3d8bbwe** in the list. You'll need this exact name to supply as an argument to the PowerShell cmdlet to remove the app in the next step.
7. Un-provision the undesired apps by executing the **remove-appxprovisionedpackage** cmdlet with this statement:
   ```
   remove-appxprovisionedpackage -online -packagename
   Microsoft.BingSports_2014.926.258.4003_neutral_~_8wekyb3d8bbwe
   ```

Figure 4.17 shows the same Start Screen as in Figure 4.15, but with the Sports app removed.

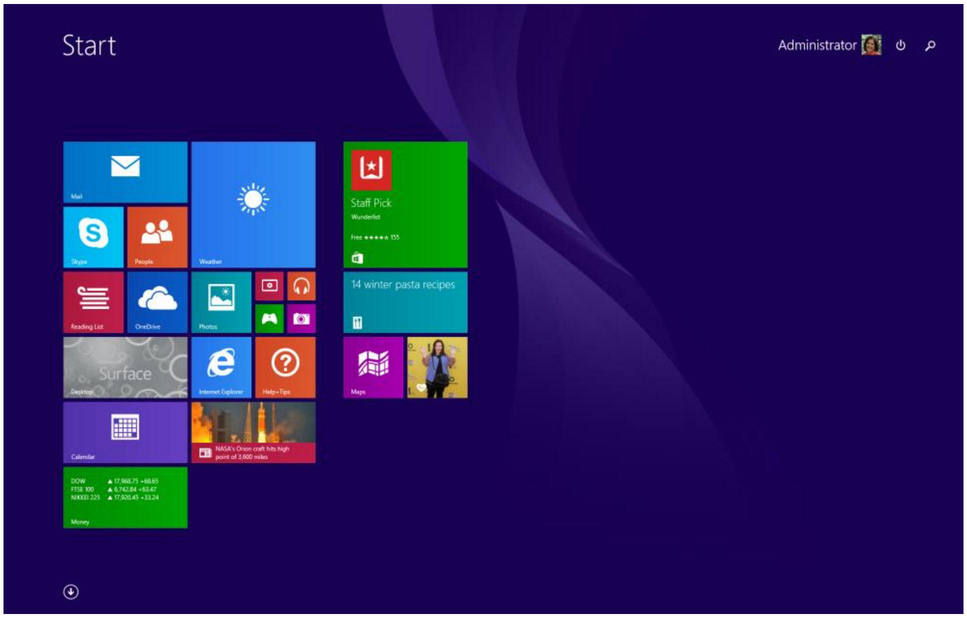


Figure 4.17: Start Screen After Sports App Removed.

Customizing the Start Screen

Customizing the Start Screen involves the arrangement of the tiles on the screen and grouping them into logical sections and alternatively naming those sections. You do this by simply dragging the tiles into the desired location on the screen, resizing them, or any other action that configures the screen any way you like. These customizations are stored in the local **Administrator** profile and will be captured as-is during the deployment process, which is described in the Testing the Image section later in this chapter.

It is a best practice, as discussed in the Considerations for Images section in Chapter 2, to not install apps on the reference system. The guidance is to install apps during deployment, which is covered in Chapter 5. However, you can still customize Start Screen tiles for apps that are not yet installed.

This is done by copying the layout of the Start Screen from a computer that does have the apps installed using a template. A *template* stores the layout of the tiles, but does not install the apps. Figure 4.18 shows the Start Screen before customization.

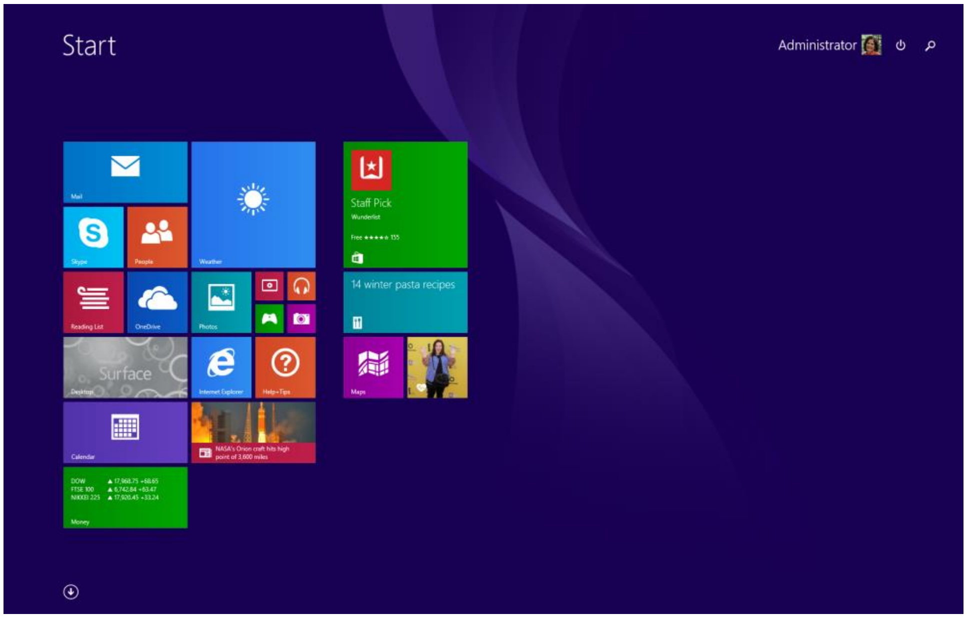


Figure 4.18: Start Screen Before Customization.

To export and import a Start Screen layout template, follow these steps:

1. On the computer with the app(s) installed, open an Administrative PowerShell session.
2. To generate the template, run the **Export-StartLayout** cmdlet with the following statement:
   ```
   export-startlayout -path c:\startscreenlayout.bin -as bin
   ```
3. Close the PowerShell session window.
4. Copy the generated **c:\startscreenlayout.bin** file from the computer with the app(s) installed to the **C:\** drive on the reference system.
5. On the reference system open an Administative PowerShell session.
6. To apply the template, run the **Import-StartLayout** cmdlet with the following statement:
   ```
   Import-startlayout -path c:\startscreenlayout.bin -mountpath c:\
   ```
7. Close the PowerShell session window.

After the layout is imported into the reference system, all customizations are visible. Figure 4.19 shows the Start Screen after customization. Notice in Figure 4.19 the desktop tile is in the top left position, the Start Screen background is changed, the **Weather** tile size is wide, and the **Reading List** tile is removed.

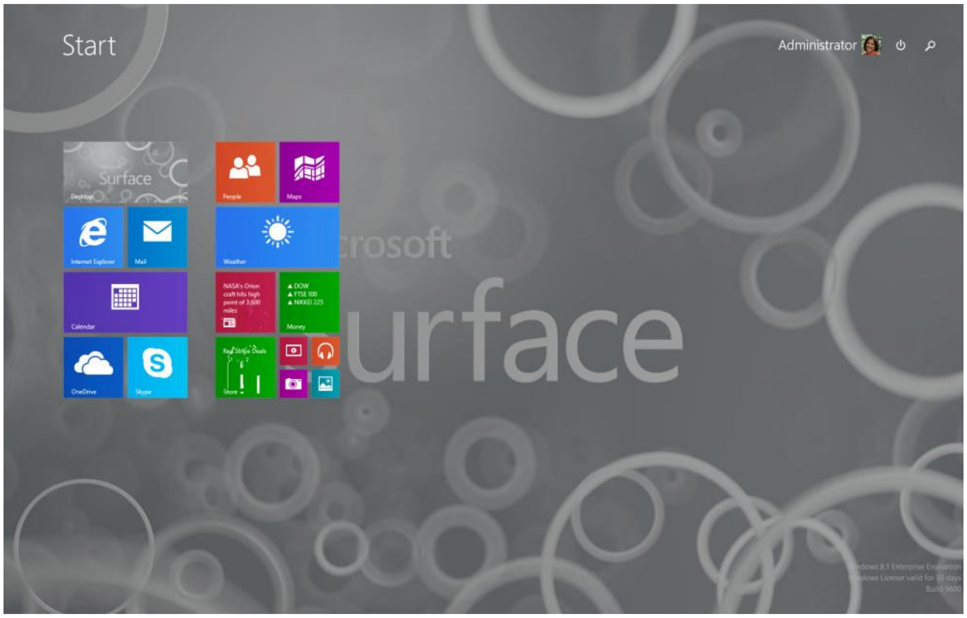


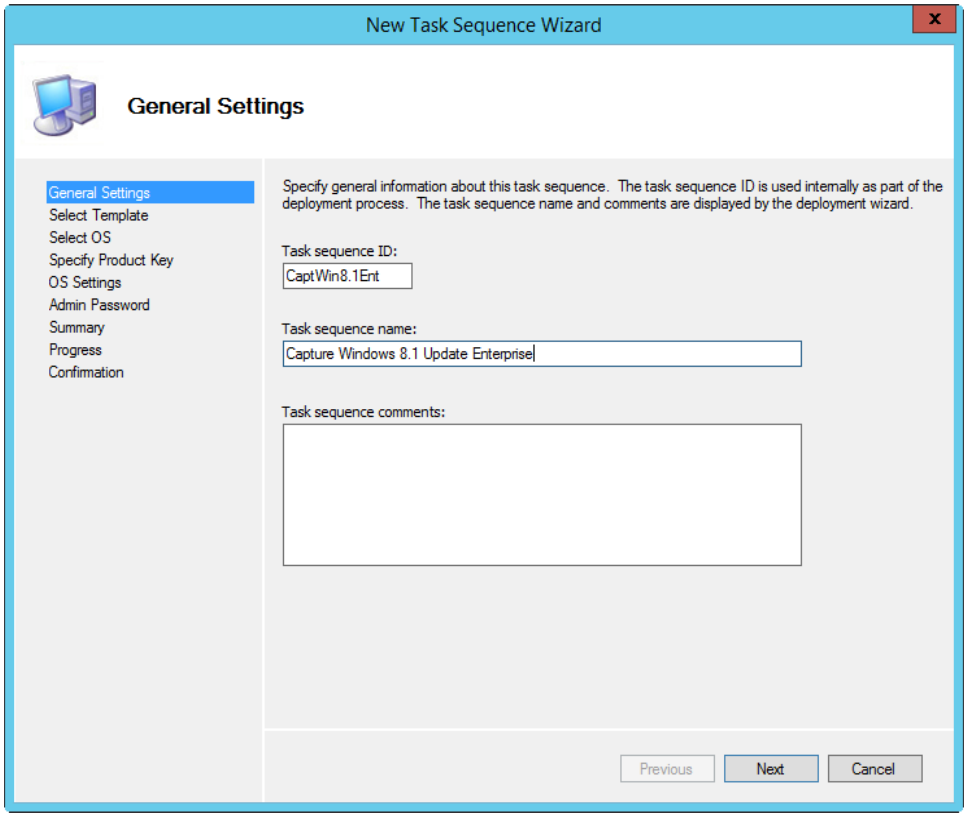
Figure 4.19: Start Screen After Customization.

Note: The same PowerShell cmdlets can also be used to generate an XML export of a Start Screen layout for use with the Start Screen Layout group policy setting.

Creating a Capture Task Sequence

After the reference system is customized the system must be prepared for deployment and captured into an image file. Capturing an image is controlled by using a task sequence. To create a task sequence to capture an image of the reference system, follow these steps:

1. Expand the **Task Sequences** folder in the **Deployment Share** tree in the **Deployment Workbench**.
2. Right-click the **Task Sequences** folder and select **New Task Sequence**. This launches the **New Task Sequence Wizard**.
3. The **New Task Sequence Wizard** presents a series of steps, as follows:
   - **General Settings –** Supply a name and ID for this new task sequence, as shown in Figure 4.20, and then click **Next**.



Specify general information about this task sequence. The task sequence ID is used internally as part of the deployment process. The task sequence name and comments are displayed by the deployment wizard.

Task sequence ID: CaptWin8.1Ent

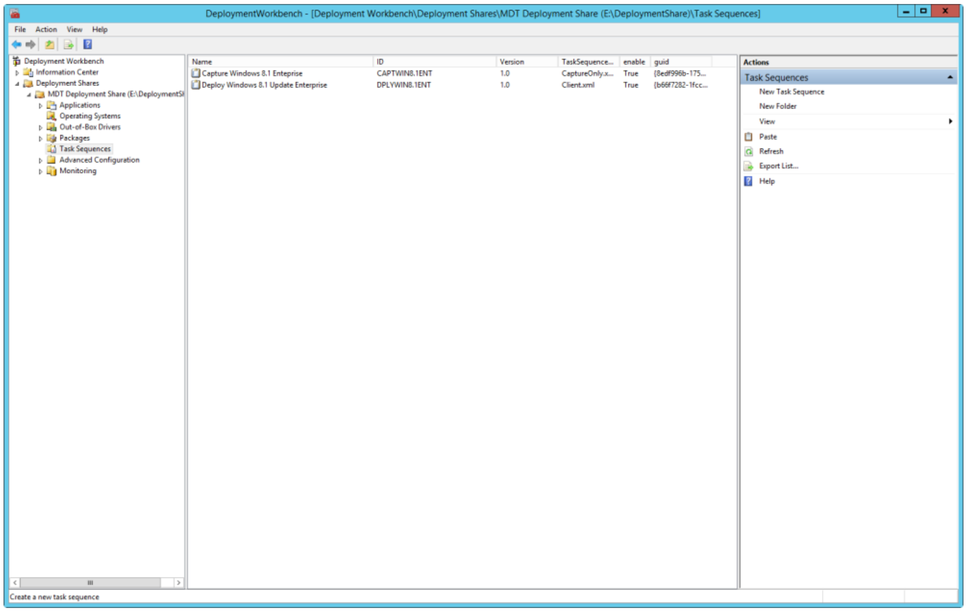
Task sequence name: Capture Windows 8.1 Update Enterprise

Task sequence comments:

Figure 4.20: Capture Task Sequence.

- **Select Template –** Select the **Sysprep and Capture** template and click **Next**.
- **Select OS –** Select the operating system that was originally deployed to the reference system and click **Next**.
- **Specify Product Key –** When capturing an image, you do not specify a product key. Click **Next**.
- **OS Settings –** Enter the desired registration information and home page and click **Next**.
- **Admin Password –** Enter the desired strong password for the local **Administrator** account and click **Next**.
- **Summary –** Confirm the selected options and click **Next**.
- **Progress –** Shows a progress bar during task sequence creation.
- **Confirmation –** Click **Finish** to complete the **New Task Sequence Wizard**.

The newly created capture task sequence appears in the **Task Sequences** folder of the deployment share as shown in Figure 4.21.



DeploymentWorkbench - [Deployment Workbench\Deployment Shares\MDT Deployment Share (E:\DeploymentShare)\Task Sequences]

Name	ID	Version	TaskSequence...	enable	guid
Capture Windows 8.1 Enteprise	CAPTWIN8.1ENT	1.0	CaptureOnly.x...	True	{8edf996b-175...
Deploy Windows 8.1 Update Enterprise	DPLYWIN8.1ENT	1.0	Client.xml	True	{b66f7282-1fcc...

Create a new task sequence

Figure 4.21: Capture and Reference Deployment Task Sequences.

Note: It is possible to perform the deployment and capture steps in the same task sequence. To accomplish this, the task sequence must automate customization to the reference image. However, automation is not possible for some tasks. Therefore, the task sequence will need to be paused to enable user interaction. MDT includes a script named **LTISuspend.wsf**, which pauses a task sequence for this purpose. Refer to the MDT documentation for more information on this script.

Profile customizations made to the reference system are stored in the local Administrator profile. Examples of some of these customizations include configuration of the Start Screen and wallpaper. To make these customizations available to all new users who log onto the deployed computer, the deployment answer file needs to have the **CopyProfile** setting configured. The **CopyProfile** setting is configured in the specialize pass, which is run during the deployment process rather than the generalize process. See the Testing the Image section in this chapter for details on including the **CopyProfile** setting in a deployment task sequence.

Unlike deploying an image, which needs read-only permissions to the deployment share, capturing an image needs to write to the **Captures** folder in the deployment share. Ensure the account specified in the **customsettings.ini** file has write permissions to the **Captures** folder.

Creating an Image from the Reference System

You have now made customizations to the reference system and prepared the capture task sequence to create an image of the reference system. Now the capture task sequence must be run on the reference system to create that image.

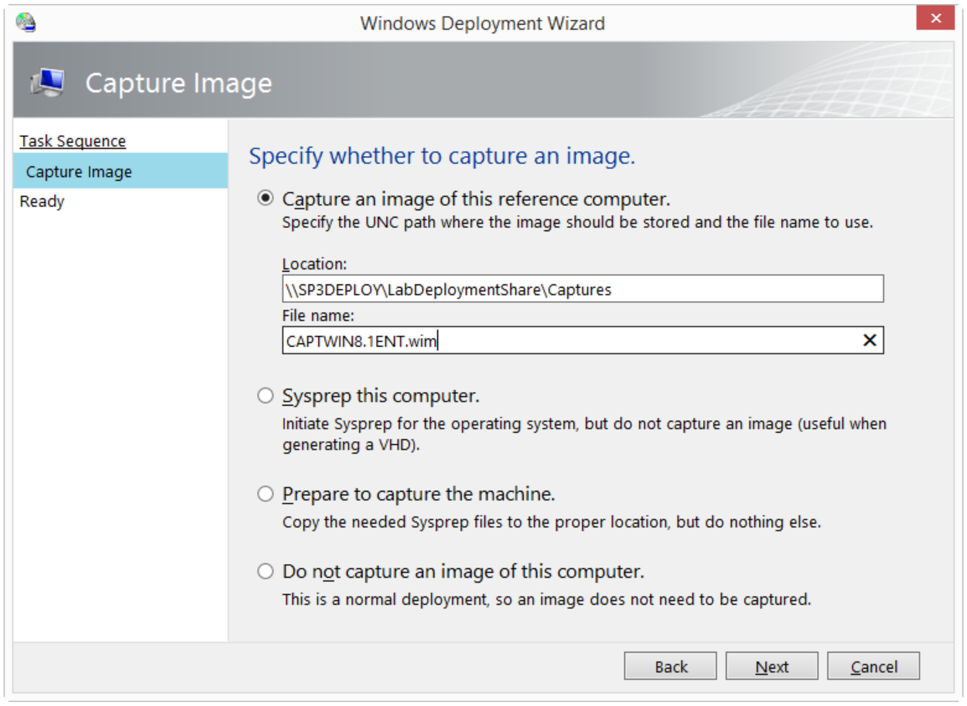
Note: Another advantage in using a virtual machine as a reference system is the ability to use checkpoints or snapshots. Checkpoints store the exact state of a virtual machine at the specified point of time. A virtual machine can be easily reverted to this state, if necessary. For example, the **Sysprep** process makes irreversible changes to the reference system, so creating a checkpoint gives you the ability to restore to a specific point in time.

Launch the **Windows Deployment Wizard** via the **litetouch.wsf** script using the following steps:

1. Open an Administrative PowerShell session.
2. Enter the following command to map a network drive to the deployment share and press **Enter**:
   ```
   net use * \\sp3deploy.contoso.com\labdeploymentshare /user:sp3deploy\mdt
   ```

   This is done to specify the user account which will be used to connect to the share. In this command **sp3deploy.contoso.com** is the name of the deployment server, **labdeploymentshare** is the name of the deployment share, and **mdt** is the name of the user account for MDT deployments. These values should be replaced with the values used in your environment.
3. Enter the following command to launch the **Windows Deployment Wizard** and press **Enter**:
   ```
   cscript \\sp3deploy.contoso.com\labdeploymentshare\Scripts\LiteTouch.WSF
   ```

4. The Windows Deployment Wizard presents a series of prompts:
   - **Task Sequence** – Select the capture task sequence that was created in the Creating a Capture Task Sequence section of this chapter and click **Next**.
   - **Capture Image** – Specify the desired location for the captured image to be placed, along with the name of the image to be created, as shown in Figure 4.22. The default location is the **Captures** folder of the deployment share, where the required write permissions were added earlier in this chapter. Click **Next**.



Specify whether to capture an image.

● Capture an image of this reference computer.
Specify the UNC path where the image should be stored and the file name to use.

Location:
\\SP3DEPLOY\LabDeploymentShare\Captures

File name:
CAPTWIN8.1ENT.wim

○ Sysprep this computer.
Initiate Sysprep for the operating system, but do not capture an image (useful when generating a VHD).

○ Prepare to capture the machine.
Copy the needed Sysprep files to the proper location, but do nothing else.

○ Do not capture an image of this computer.
This is a normal deployment, so an image does not need to be captured.

Figure 4.22: Settings for Image Capture.

Testing the Image

After the image has been captured, it is ready to be used to deploy to other computers. To verify the successful application of the customizations in the resulting image, a test deployment to a second virtual machine in the lab is recommended. To perform this test deployment, follow these steps:

1. Import the captured image in the deployment share
2. Create a new test deployment task sequence
3. Run the new test deployment task sequence on a second virtual machine (VM3), as shown in Figure 4.1.

Each of these steps is covered in the next three sections.

Importing the Captured Image

To import the captured image in the deployment share, follow these steps:

1. Expand the deployment share in the **Deployment Workbench.**
2. Right-click **Operating Systems**, and then select **Import Operating System**. This launches the **Import Operating System Wizard**.
3. The **Import Operating System Wizard** presents the following steps:

   - **OS Type** – Select the type of operating system to add. Select the **Custom Image** option. Click **Next**.
   - **Image** – Enter or browse to the **Custom** folder in the deployment share and select the image captured in the previous section of this chapter. Check the **Move the files to the deployment share instead of copying them** check box if you'd like to reduce the storage space required by the MDT deployment share, but it isn't necessary for the imported image in this scenario. Click **Next**.
   - **Setup** – Select the **Copy Windows 7, Windows Server 2008 R2, or later setup files from the specified path** option. Enter or browse to the **Operating Systems** folder of the deployment share and select the folder that contains the original operating system installation media for the reference system. Click **Next**.
   - **Destination** – Enter the name of the folder where the operating system files will be stored. This folder is created in the deployment share on the deployment server. For example, you could enter **Windows 8.1 Custom** as the destination. Click **Next**.
   - **Summary** – Review the summary of your operating system import configuration and click **Next**.
   - **Progress** – Displays a progress bar during the importing of the operating system files.
   - **Confirmation** – Displays confirmation of success or errors generated while importing the operating system files. Click **Finish** to close the **Import Operating System Wizard**.

   More details about the options presented by the **Import Operating System Wizard** are available in Chapter 2.

Creating the Test Deployment Task Sequence

To create the test deployment task sequence, follow these steps:

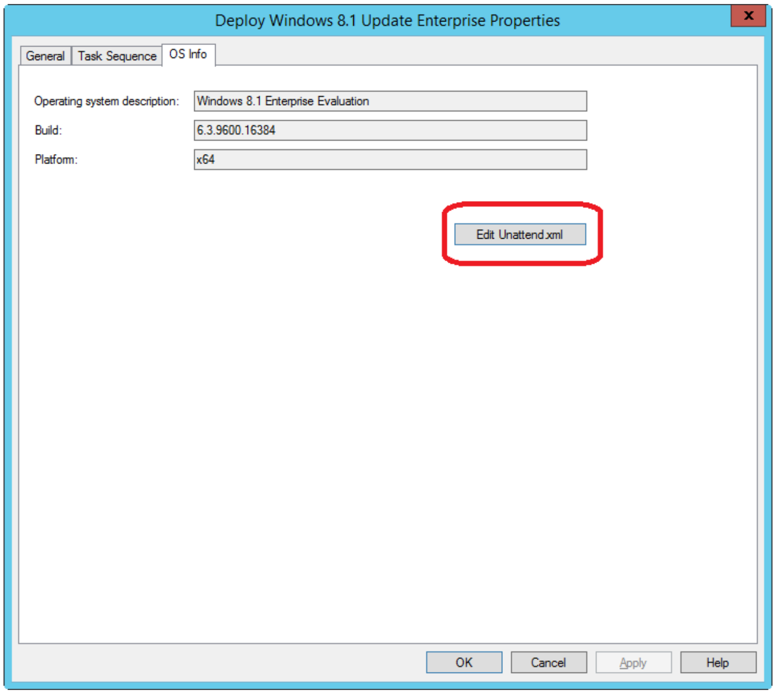
1. Expand the deployment share in the **Deployment Workbench**.
2. Right-click the **Task Sequences** folder, then select **New Task Sequence**.
3. The New Task Sequence Wizard presents a number of steps, as follows:

- **General Settings** – Enter the desired task sequence ID, name, and comments. Click **Next**.
- **Select Template** – Select the **Standard Client Task Sequence** and click **Next**.
- **Select OS** – Select the operating system you imported from your custom image. Click **Next**.
- **Specify Product Key** – Select **Do not specify a product key at this time** and click **Next**.
- **OS Settings** – Enter the desired registration information and home page and click **Next**.
- **Admin Password** – Specify a strong password for the local **Administrator** account on the deployed computer. Click **Next**.
- **Summary** – Review the summary of your new task sequence and click **Next**.
- **Progress** – Displays a progress bar during the creation of the new task sequence.
- **Confirmation** – Displays confirmation of success or errors generated while creating the task sequence. Click **Finish** to close the **New Task Sequence Wizard**.

For more information about what the CopyProfile setting does and how it relates to the local Administrator account, refer to the Creating a Capture Task Sequence section earlier in this chapter.

To set the **CopyProfile** setting in the answer file, follow these steps:

1. Open the **Task Sequences** folder of the deployment share in the **Deployment Workbench**.
2. Right-click the test deployment task sequence and select **Properties**.
3. In the task sequence properties, select the **OS Info** tab.
4. Edit the answer file by clicking the **Edit Unattend.xml** button, as shown in Figure 4.23. This launches the Windows System Image Manager (Windows SIM).



Operating system description: Windows 8.1 Enterprise Evaluation
Build: 6.3.9600.16384
Platform: x64

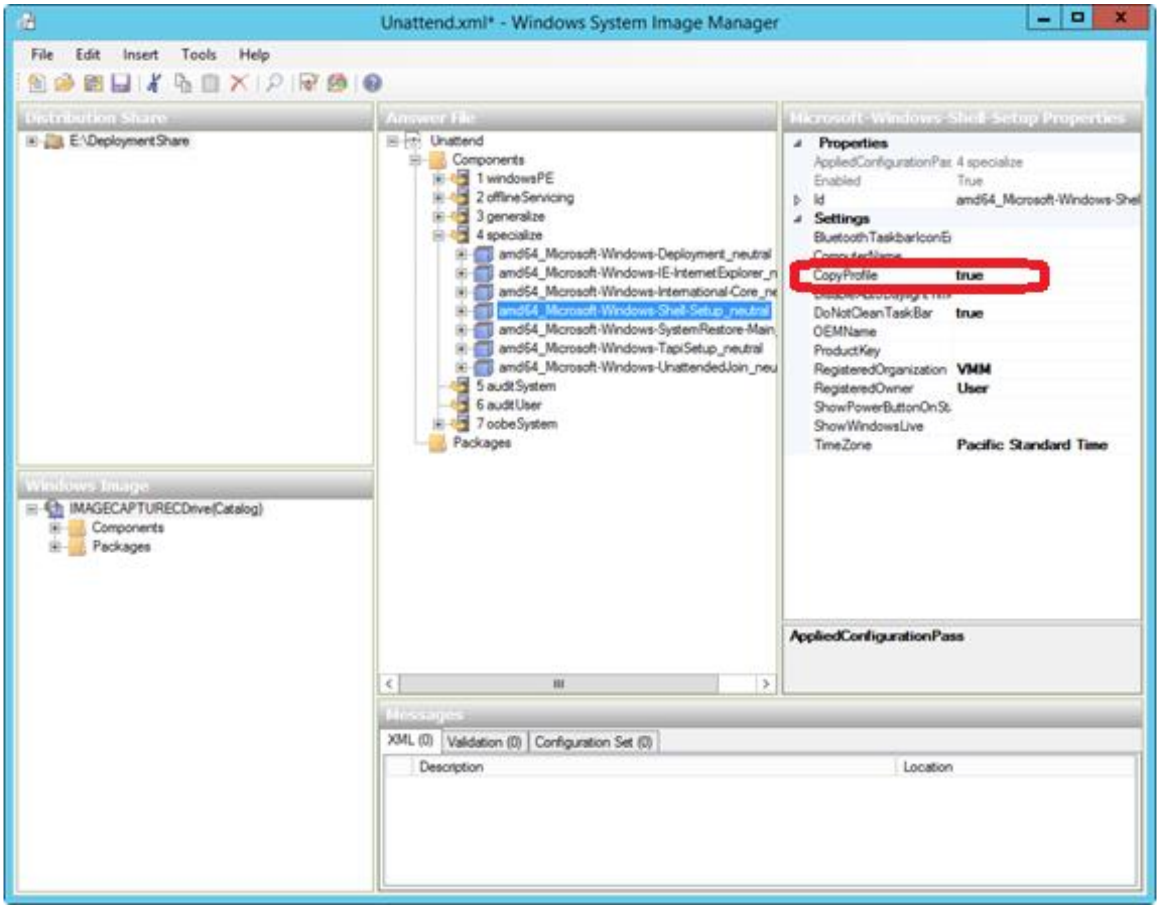
Figure 4.23: OS Info Tab Showing Edit Unattend.xml Button.

Note: When the answer file for a specific operating system is opened for editing for the first time, a catalog of available settings is generated. This may take several minutes.

5. Select the **Edit→Find** menu or press **Ctrl+F** to launch the **Find** dialog box.

> **Note:** With a large number of available components, it is typically quicker to find a specific setting by searching rather than expanding the components tree under the **Windows Image** pane.

6. Enter the term **copyprofile** and click **Find Now** to locate the **Microsoft-Windows-Shell-Setup** component.
7. Double-click the amd64 version of the component to locate the setting in the **Windows Image** pane that matches the architecture of the image being deployed.
8. Right-click the **Microsoft-Windows-Shell-Setup** component and select **Add Setting to Pass 4 specialize**.
9. Select the setting from the **Answer File** pane in the center of Windows SIM. After this setting is selected, the available setting options will appear in the right pane which is labeled with the setting name, **Microsoft-Windows-Shell-Setup**.
10. Set the property value for the **CopyProfile** setting to **True** as shown in Figure 4.24.


Unattend.xml* - Windows System Image Manager
File
Edit
Insert
Tools
Help
Distribution Share
E:\DeploymentShare
Windows Image
IMAGECAPTURECDrive(Catalog)
Components
Packages
Answer File
Unattend
Components
1 windowsPE
2 offlineServicing
3 generalize
4 specialize
amd64_Microsoft-Windows-Deployment_neutral
amd64_Microsoft-Windows-IE-InternetExplorer_n
amd64_Microsoft-Windows-International-Core_ne
amd64_Microsoft-Windows-Shell-Setup_neutral
amd64_Microsoft-Windows-SystemRestore-Main_
amd64_Microsoft-Windows-TapiSetup_neutral
amd64_Microsoft-Windows-UnattendedJoin_neu
5 auditSystem
6 auditUser
7 oobeSystem
Packages
Microsoft-Windows-Shell-Setup Properties
AppliedConfigurationPass
Messages
XML (0)
Validation (0)
Configuration Set (0)
Description
Location

Properties	
AppliedConfigurationPas	4 specialize
Enabled	True
Id	amd64_Microsoft-Windows-Shel
Settings	
BluetoothTaskbarIconE	
ComputerName	
CopyProfile	true
DisableAutoDaylightTim	
DoNotCleanTaskBar	true
OEMName	
ProductKey	
RegisteredOrganization	VMM
RegisteredOwner	User
ShowPowerButtonOnSt	
ShowWindowsLive	
TimeZone	Pacific Standard Time

Figure 4.24: Configuring CopyProfile Settings.

11. Select the **File→Save Answer File** menu or press **Ctrl+S** to save the answer file.

> **Note:** Windows SIM will automatically validate the answer file when selecting save. Any settings that are configured improperly will result in a warning message on the screen.

12. Close Windows SIM.

When the image is applied to the target system, the specialize pass will run, which copies the **Administrator** profile to the local Default User profile, enabling new users to receive the customizations made to the **Administrator** profile in the reference system.

Deploying the Captured Image

To deploy to the test system (VM3), follow the procedure for deploying as outlined in the Deploying to the Reference System section in this chapter, but in step #5, where you select the task sequence, select the test deployment task sequence created in the **Testing the Image** section in this chapter. All other parts of the procedure remain the same.

The deployed system (VM3) will contain the customizations configured in the reference system (VM2). Before rolling out the image to production, as detailed in Chapter 5, verify that all customizations are present in VM3.

Chapter 5 – Automated Deployment with MDT

The automated deployment scenario in this chapter builds upon the reference deployment scenario discussed in Chapter 4. The automated deployment scenario decreases the level of interaction required by the user/technician and also includes apps and drivers. The automated deployment produces a computer that is production-ready.

While this chapter shows how to deploy to computers in two specific scenarios (connected and offline), the procedures outlined in this chapter can be used to address the demands of an entire organization, including the need for different apps, computer models, and customizations.

The deployment process described in each scenario can be used to deploy any number of computers, but this step-by-step focuses on three specific computers, as shown in Figure 5.1:

- **Production Deployment Server**
  - Windows Server 2012 R2
  - Windows Assessment and Deployment Kit (Windows ADK)
  - Microsoft Deployment Toolkit (MDT)
  - Windows Deployment Services (WDS)
- **PC1: Connected Device**
  - A Surface Pro 3 device
  - Connected to the corporate network
- **PC2: Offline**
  - A Surface Pro 3 device
  - Not connected to the corporate network

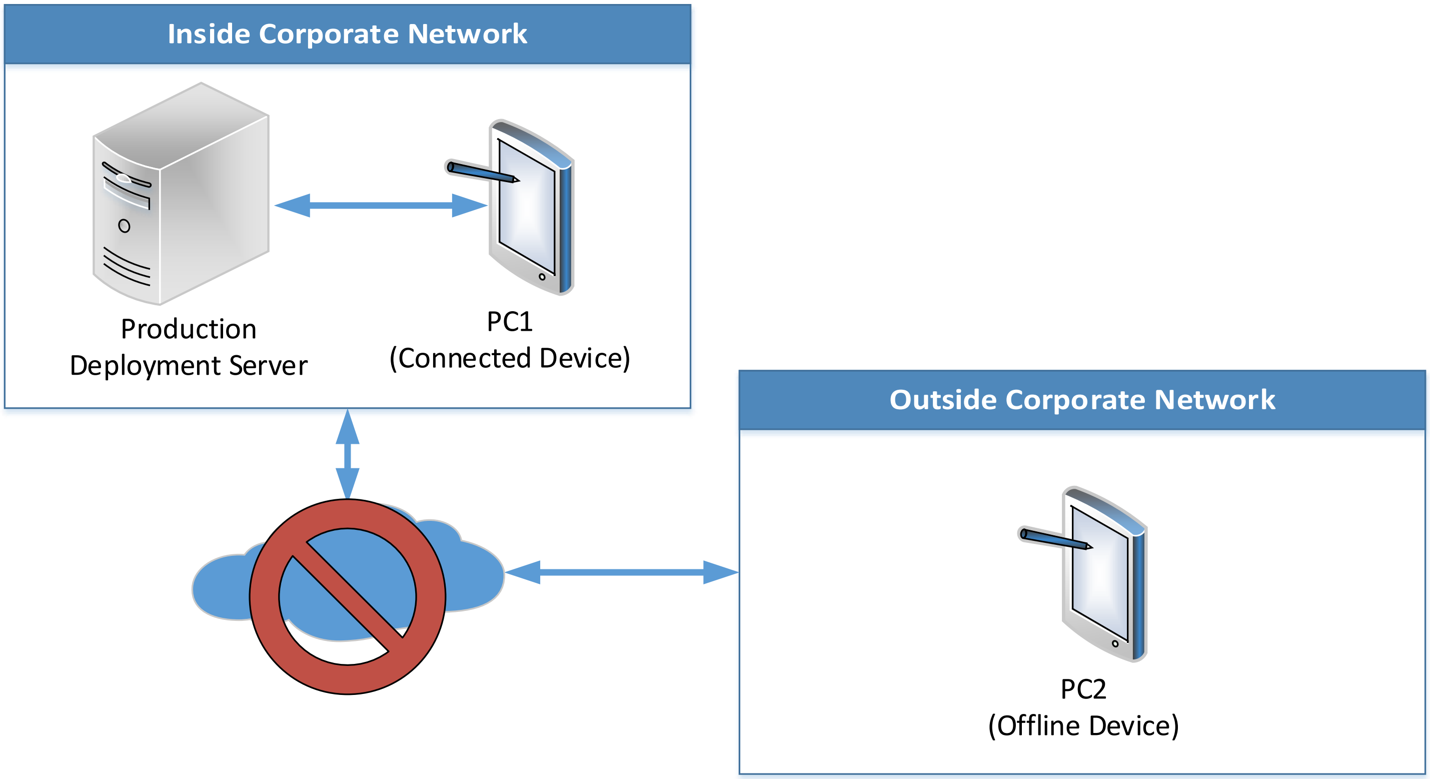


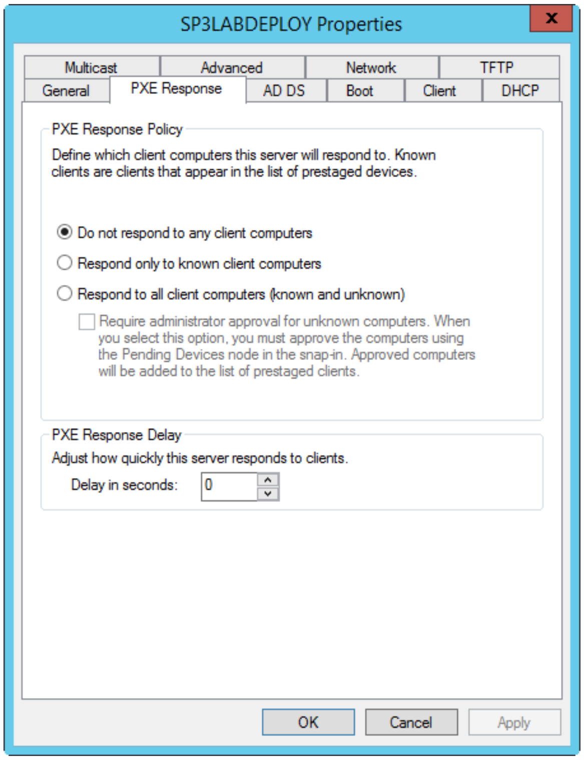
Figure 5.1: Offline Deployment Scenario Computers.

Note: A USB stick with at least 10GB of storage is required for the offline deployment outlined in this chapter. The USB drive must be reported as a fixed drive to support multiple partitions. A Windows To Go certified drive is recommended.

Disabling WDS PXE Boot

In Chapter 4, the lab deployment server was configured for PXE boot. Therefore, if your lab deployment server is on the same network as the production deployment server shown in Figure 5.1, PXE boot on the lab deployment server will need to be disabled to prevent conflicting responses. To disable network boot, follow these steps:

1. Launch **Windows Deployment Services** on the lab deployment server.
2. Expand the **Servers** tree and right-click the lab deployment server, then select **Properties**.
3. Select the **PXE Response** tab.
4. Select the **Do not respond to any client computers** option as shown in Figure 5.2 and click **OK** to save and exit the server WDS properties.



PXE Response Policy

Define which client computers this server will respond to. Known clients are clients that appear in the list of prestaged devices.

● Do not respond to any client computers

○ Respond only to known client computers

○ Respond to all client computers (known and unknown)

□ Require administrator approval for unknown computers. When you select this option, you must approve the computers using the Pending Devices node in the snap-in. Approved computers will be added to the list of prestaged clients.

PXE Response Delay

Adjust how quickly this server responds to clients.

Delay in seconds: 0

Figure 5.2: Disabling PXE Response to Clients.

5. Close **Windows Deployment Services**.

Creating the Production Deployment Share

The production deployment share will contain the applications, drivers, and custom images for deployment across the organization and will share these components with the offline deployment share. The deployment production share and offline deployment share will use the same apps, drivers, and images, so instead of duplicating effort, deployment shares can be linked. To create the production deployment share follow the Creating a Deployment Share section outlined in Chapter 3.

Customizing Rules for Automation

As with the reference deployment scenario outlined in Chapter 4, the deployment share will be customized by configuring rules to bypass the prompts that are displayed by the **Windows Deployment Wizard**. As you may recall, these rules are stored in the configuration files **customsettings.ini** and **bootstrap.ini**, which control the **Windows Deployment Wizard** and boot media respectively.

To configure deployment share rules to automate the **Windows Deployment Wizard**, follow these steps:

1. Expand the **Deployment Shares** tree in **Deployment Workbench**.
2. Right-click the production deployment share and select **Properties**.
3. Select the **Rules** tab.
4. Replace the text displayed on the **Rules** tab with the text provided in Listing 5.1:

```
[Settings]
```

```
Priority=Default
Properties=MyCustomProperty

[Default]
OSInstall=Y
SkipCapture=YES
SkipAdminPassword=YES
SkipProductKey=YES
SkipComputerBackup=YES
SkipBitLocker=YES
SkipBDDWelcome=YES
SkipUserData=YES
UserDataLocation=AUTO
SkipApplications=YES
SkipPackageDisplay=YES
SkipComputerName=YES
SkipDomainMembership=YES
JoinDomain=contoso.com
DomainAdmin=MDT
DomainAdminDomain=contoso
DomainAdminPassword=P@ssw0rd
SkipLocaleSelection=YES
KeyboardLocale=en-US
UserLocale=en-US
UILanguage=en-US
SkipTimeZone=YES
TimeZoneName=Pacific Standard Time
UserID=MDT
UserDomain=SP3ProdDeploy
UserPassword=P@ssw0rd
SkipSummary=YES
SkipFinalSummary=YES
```

Listing 5.1: Deployment Share Rules for Added Automation

Listing 5.1 differs from the similar listing 4.1 in Chapter 4 in the following ways:

- **SkipCapture –** This setting has been changed to **YES** to prevent the **Capture Image** page of the **Windows Deployment Wizard** from appearing. Custom images for this production deployment share will be produced in the lab environment and thus image capturing will not be performed from the production deployment share.
- **SkipApplications –** By configuring this setting to **NO**, the **Applications** page of the **Windows Deployment Wizard** will not be displayed, even if there are applications available in the deployment share and the install applications step is present in the task sequence. To install applications while keeping this page hidden, an application installation step must be created to explicitly define an application for installation. See the Importing Applications section later in this chapter for more information.
- **SkipPackageDisplay –** By configuring this setting to **NO**, the **Packages** page will be hidden, even if language packs, updates, or firmware packs are available in the deployment share. Packages will need to be specified by a

selection profile in the task sequence. Selection profiles are covered in the Importing Drivers section in this chapter.

- **SkipDomainMembership –** This setting is still configured as **YES** to prevent the display of the domain or workgroup join fields on the Computer Details page, but rather than specifying a workgroup to join, the following settings specify a domain to be joined along with the required credentials:
    - **JoinDomain** – This setting is used to specify the domain for the deployed computer to join.
    - **DomainAdmin** – This setting is used to specify the user name with rights to join a computer to the domain.
    - **DomainAdminDomain** – This setting is used to specify the domain membership of the user being used to join the computer to the domain.
    - **DomainAdminPassword** – This setting is used to specify the password for the user being used to join the computer to the domain.

> **Note**: The user name and password information is stored in the deployment share rules in plaintext. As such it is recommended to use an account that is designated to the required task only. In this case the user account MDT in the contoso.com domain will be configured with delegation rights to join computers to the domain and will be enabled only during active deployments.

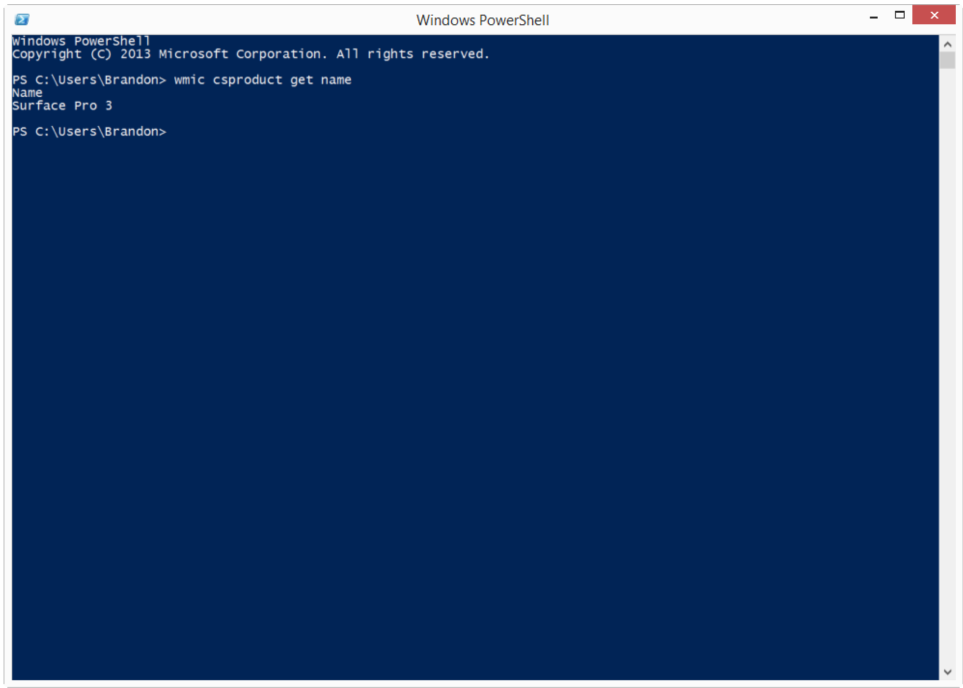
Follow the procedure for configuring the **bootstrap.ini** file in the Configuring Boot Media Rules section of Chapter 4.

Customizing Task Sequence Selection by Model

The **SkipTaskSequence** setting is not specified in the **[Default]** section of the deployment share rules, but is required for full automation of the deployment. It was omitted to enable a technician to select between task sequences during deployment. If it was specific in the rules, the same task sequence would be applied to every computer. To automate the selection process for a specific computer model, you need to determine the value for the built-in **Model** variable and specify it in the **customsettings.ini** file.

To find the value for the **Model** variable for a specific computer or device, launch a PowerShell session on the desired computer and run the following command, as shown in Figure 5.3:

```
wmic csproduct get name
```



```
Windows PowerShell
Copyright (C) 2013 Microsoft Corporation. All rights reserved.

PS C:\Users\Brandon> wmic csproduct get name
Name
Surface Pro 3

PS C:\Users\Brandon>
```

Figure 5.3: WMI Model Name for Surface Pro 3.

To add automatic selection of a task sequence for Surface Pro 3 devices, follow these steps:

1. Expand the **Deployment Shares** tree in the **Deployment Workbench**.
2. Right-click the production deployment share and select **Properties**.
3. Select the **Rules** tab.
4. Replace the **[Settings]** section of the text with the following, which will add the instructions for rules specified with the built-in **Model** variable to be processed before the default rules using the **Priority** rule. The **Priority** rule is used to define how the sections in the **customsettings.ini** file are processed by the MDT scripts.
   ```
   [Settings]
   Priority=Model,Default
   Properties=MyCustomProperty
   ```
5. Add a new section for the **Model** value shown in the command result in Figure 5.3, but include the name in square brackets. For example, **[Surface Pro 3]** is the name of the section for the **Surface Pro 3** model. The new section is added to the text between the **[Settings]** and **[Default]** sections with the following text:
   ```
   [Surface Pro 3]
   ```
6. Under the **[Surface Pro 3]** section, add these two rules:
   ```
   SkipTaskSequence=YES
   TaskSequenceID=SP3Win8.1EntCst
   ```

   The two rules in the new **[Surface Pro 3]** section are:

- **SkipTaskSequence** – Setting **SkipTaskSequence** to **YES** will bypass the **Task Sequence** page of the **Windows Deployment Wizard**. When this setting is enabled, a task sequence must be specified using **TaskSequenceID** setting.
- **TaskSequenceID** – This setting is used to specify the ID of the task sequence to be used by the **Windows Deployment Wizard**.

The final configuration of the rules should match Listing 5.2, as follows:

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

[Surface Pro 3]
SkipTaskSequence=YES
TaskSequenceID=SP3Win8.1EntCst

[Default]
OSInstall=Y
SkipCapture=YES
SkipAdminPassword=YES
SkipProductKey=YES
SkipComputerBackup=YES
SkipBitLocker=YES
SkipBDDWelcome=YES
SkipUserData=YES
UserDataLocation=AUTO
SkipApplications=YES
SkipPackageDisplay=YES
SkipComputerName=YES
SkipDomainMembership=YES
JoinDomain=contoso.com
DomainAdmin=MDT
DomainAdminDomain=contoso
DomainAdminPassword=P@ssw0rd
SkipLocaleSelection=YES
KeyboardLocale=en-US
UserLocale=en-US
UILanguage=en-US
SkipTimeZone=YES
TimeZoneName=Pacific Standard Time
UserID=MDT
UserDomain=SP3ProdDeploy
UserPassword=P@ssw0rd
SkipSummary=YES
SkipFinalSummary=YES
```

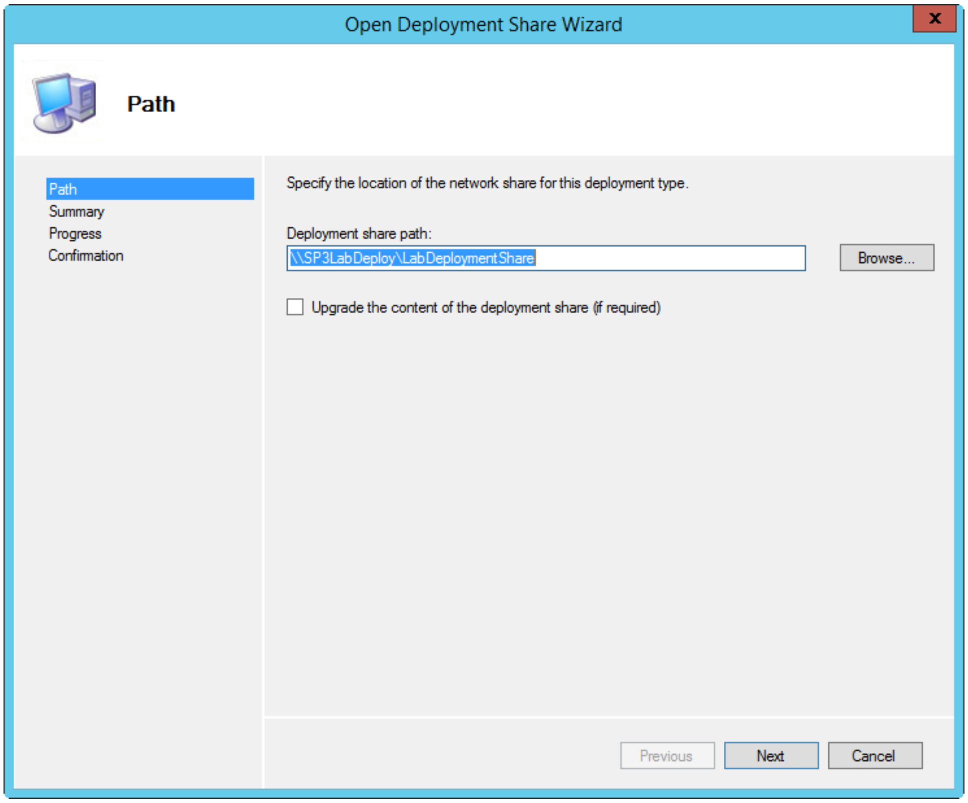
Listing 5.2: Complete Deployment Share Rules Including [Surface Pro 3] Section.

Importing the Custom Image

To use the custom image developed in the reference deployment scenario described in Chapter 4, the image needs to reside in the production deployment share. The image WIM file can be copied from the source computer and imported with the **Import Operating System Wizard** in the same way that it was in the Importing the Captured Image section in Chapter 4, or it can be copied directly between deployment shares.

To copy the image between deployment shares, the lab deployment share must be opened on the production deployment server. To open to the lab deployment share, follow these steps:

1. Right-click the **Deployment Shares** section of the **Deployment Workbench**, then select **Open Deployment Share**. This launches the **Open Deployment Share Wizard**.
2. The **Open Deployment Share Wizard** shown in Figure 5.4 presents a number of steps, as follows:



Open Deployment Share Wizard

Path

Specify the location of the network share for this deployment type.

Deployment share path: \\SP3LabDeploy\LabDeploymentShare

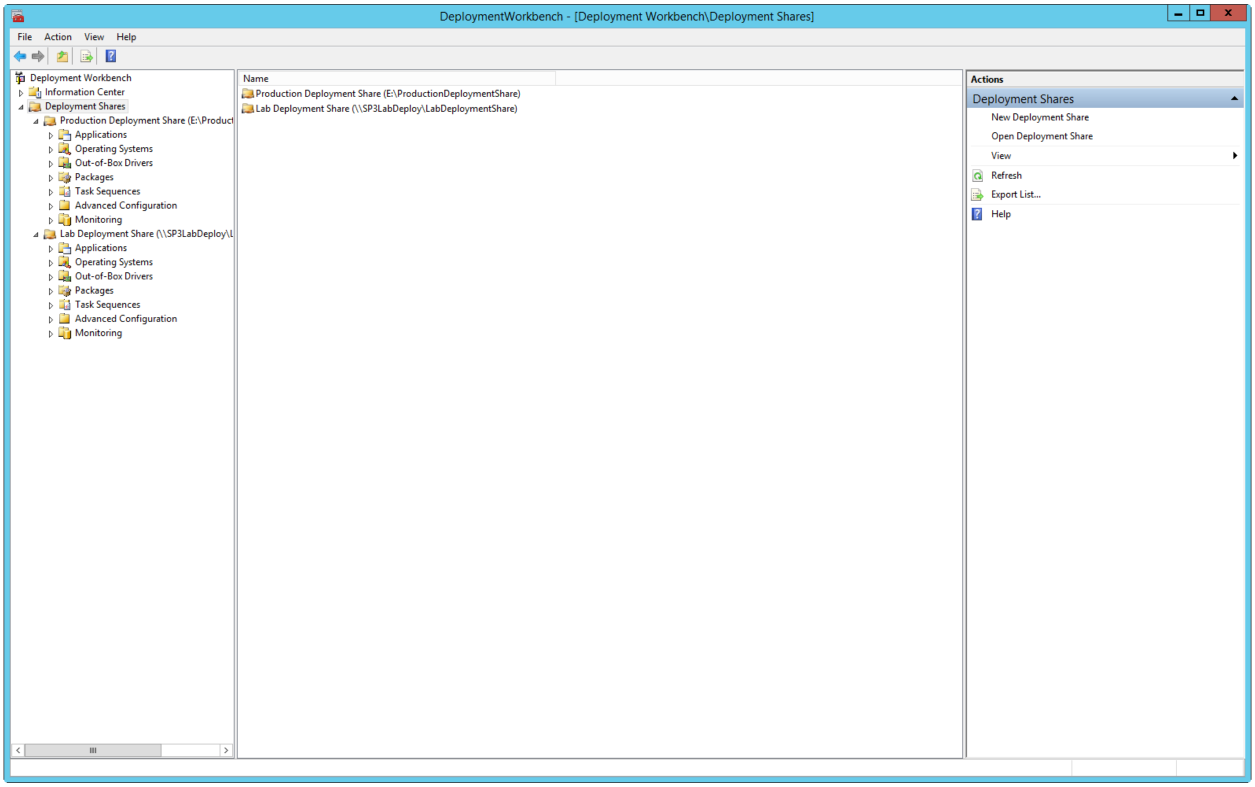
☐ Upgrade the content of the deployment share (if required)

Figure 5.4: Open Deployment Share Wizard.

- **Path** – Specify the network location of the lab deployment share and click **Next**.
- **Summary** – Confirm the selected options and click **Next**.
- **Progress** – Shows a progress bar during connection to the deployment share.
- **Confirmation** – Click **Finish** to complete the **Open Deployment Share Wizard**.

3. Expand the **Deployment Shares** tree, then select the added deployment share.

After the two deployment shares are open in the **Deployment Workbench**, as shown in Figure 5.5, components can be copied and pasted between them. Copy and paste the custom image from the **Operating Systems** folder of the lab deployment share to the **Operating Systems** folder of the production deployment share. Also copy the test deployment task sequence that you created in the Creating the Test Deployment Task Sequence section in Chapter 4 to the production deployment share.



DeploymentWorkbench - [Deployment Workbench\Deployment Shares]

Name

Production Deployment Share (E:\ProductionDeploymentShare)

Lab Deployment Share (\\SP3LabDeploy\LabDeploymentShare)

Figure 5.5: Deployment Workbench Showing Lab and Production Deployment Shares.

Importing Drivers

While the customized image and test deployment task sequence from the lab deployment share both work fine in a virtual machine, they contain no specific drivers for a physical computer. To deploy to Surface Pro 3 devices, the drivers for WinPE and for Windows must be imported and organized for selection during deployment and boot media creation. Follow the process provided in the Importing Drivers section of Chapter 3 to import the drivers for Surface Pro 3 into the deployment share.

Importing Applications

Now that drivers are supplied for the Surface Pro 3, the next step is to prepare any applications desired for installation in the deployed operating system. In this scenario, the applications Adobe Reader, Oracle Java Runtime Environment, and Microsoft Office 2013 Professional Plus via Microsoft Office 365 will be required on the deployed Surface Pro 3 devices.

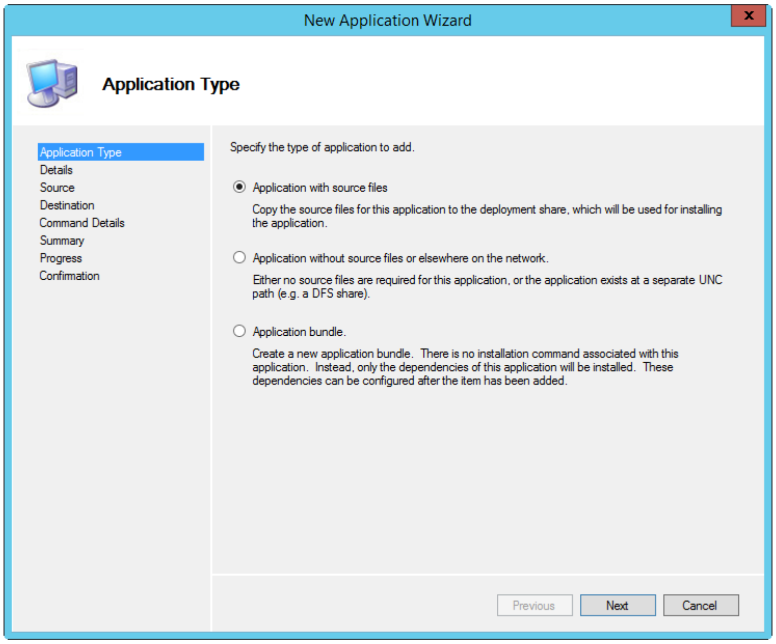
Application installation during deployment is performed by specifying a command that runs a setup program or installation files that have been imported into the deployment share, or files that are available on the network. The command for installation will vary from application to application, so it is important to consult the documentation provided by the developer for the correct switches and syntax.

Importing Adobe Reader

> **Note:** Licensing for volume distribution of Adobe Reader and the files required by this process require registration with Adobe at this link:
>
> http://www.adobe.com/products/reader/rdr_distribution1.html

Assuming you have access to the installation files for Adobe Reader, import and prepare installation of Adobe Reader by following these steps:

1. Open the MDT **Deployment Workbench**.
2. Expand the deployment share and select the **Applications** folder.
3. Select **New Application** from the **Actions** pane to launch the **New Application Wizard**.
4. The **New Application Wizard** presents the following steps:
   - **Application Type** – Select **Application with source files** from the following options shown in Figure 5.6, and then click **Next**.



Specify the type of application to add.

● Application with source files

Copy the source files for this application to the deployment share, which will be used for installing the application.

○ Application without source files or elsewhere on the network.

Either no source files are required for this application, or the application exists at a separate UNC path (e.g. a DFS share).

○ Application bundle.

Create a new application bundle. There is no installation command associated with this application. Instead, only the dependencies of this application will be installed. These dependencies can be configured after the item has been added.

Figure 5.6: Application Type Options.

   - ○ **Application with source files** – Use this option to specify an application whose source files will be imported into the deployment share.
   - ○ **Application without source files or elsewhere on the network.** – Use this option to specify an application that is available on the network outside the deployment share.
   - ○ **Application bundle.** – Use this option to specify the installation procedure for an application with dependencies.

- **Details** – Provide the following details to identify the application, then click **Next**:
  - ○ **Publisher** – Enter **Adobe**

        - **Application Name** – Enter **Reader**
        - **Version** – Enter **11.0.09** or the version of your Adobe Reader installation files.
        - **Language** – Enter **en-US** or the language/locale of your Adobe Reader installation files.
    - **Source** – Specify or browse to the directory in which the application installation files are located, then click **Next**.

> **Note:** The import process will include all files and subfolders in the location selected. For Adobe Reader, only the single EXE file is required. To ensure it is the only file imported, place the EXE file in a separate folder.

    - **Destination** – Specify a name for the folder in which to place the installation files, or leave the folder name default. Click **Next**.
    - **Command Details** – Provide the command which will be run to install the application. For Adobe Reader, use the following command to enable silent installation, then click **Next**:

```
AdbeRdr11009_en_US.exe /sAll /msi /norestart ALLUSERS=1 EULA_ACCEPT=YES
DISABLEDESKTOPSHORTCUT=1
```

    - **Summary** – Confirm the summary of the options supplied for the application and click **Next**.
    - **Progress** – A progress bar is displayed during the import process.
    - **Confirmation** – A confirmation screen is displayed showing the success of the application import. Click **Finish** to exit the **New Application Wizard**.

Importing Oracle Java

> **Note:** To deploy Java Runtime Environment with MDT, the offline installation files are required. These offline files are available for both 64 bit and 32 bit browsers. Internet Explorer will only use an installed version of Java in the desktop environment, which is 32 bit even when the Windows architecture is 64 bit. Therefore the required Java version is **Windows Offline (32-bit)**, and is available for download at this link:
>
> http://java.com/en/download/manual.jsp

Assuming you have access to the installation files for Oracle Java, import and prepare installation of Oracle Java by following these steps:

1. Open the MDT **Deployment Workbench**.
2. Expand the deployment share and select the **Applications** folder.
3. Select **New Application** from the **Actions** pane to launch the **New Application Wizard**.
4. The **New Application Wizard** presents the following steps:
    - **Application Type** – Select **Application with source files**, then click **Next**.
    - **Details** – Provide the following details to identify the application, then click **Next**:
        - **Publisher** – Enter **Oracle**
        - **Application Name** – Enter **Java**
        - **Version** – Enter **8u25 i586** or the version of your Java installation files.
        - **Language** – Enter **en-US** or the language of your Java installation files.
    - **Source** – Specify or browse to the directory in which the application installation files are located, then click **Next**.

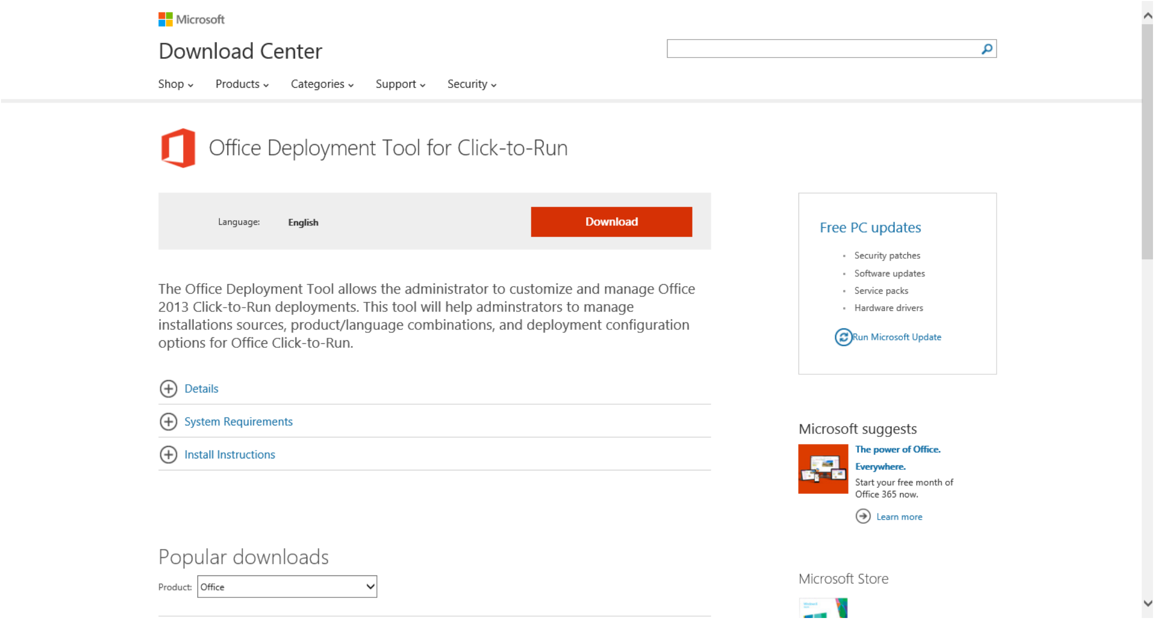
- **Destination** – Specify a name for the folder in which to place the installation files, or leave the folder name default. Click **Next**.
- **Command Details** – Provide the command which will be run to install the application. For Adobe Reader, use the following command to enable silent installation, then click **Next**:
  ```
  jre-8u25-windows-i586.com /s
  ```
- **Summary** – Confirm the summary of the options supplied for the application and click **Next**.
- **Progress** – A progress bar is displayed during the import process.
- **Confirmation** – A confirmation screen is displayed showing the success of the application import. Click **Finish** to exit the **New Application Wizard**.

Importing Microsoft Office

Note: Installation of Office through Office 365 uses **Click-to-Run**, a technology for streaming the installation of Office to reduce the time required during download and installation. **Click-to-Run** is also required for retail versions of Office. Volume license versions of Office can be deployed using MSI packages provided on downloadable media and use a different, more traditional, deployment process.

Before deploying Office 365, a local source for the installation files must be created using the **Office Deployment Tool**, which can be downloaded from the following link, as shown in Figure 5.7:

http://go.microsoft.com/fwlink/p/?LinkId=282642



Office Deployment Tool for Click-to-Run

The Office Deployment Tool allows the administrator to customize and manage Office 2013 Click-to-Run deployments. This tool will help adminstrators to manage installations sources, product/language combinations, and deployment configuration options for Office Click-to-Run.

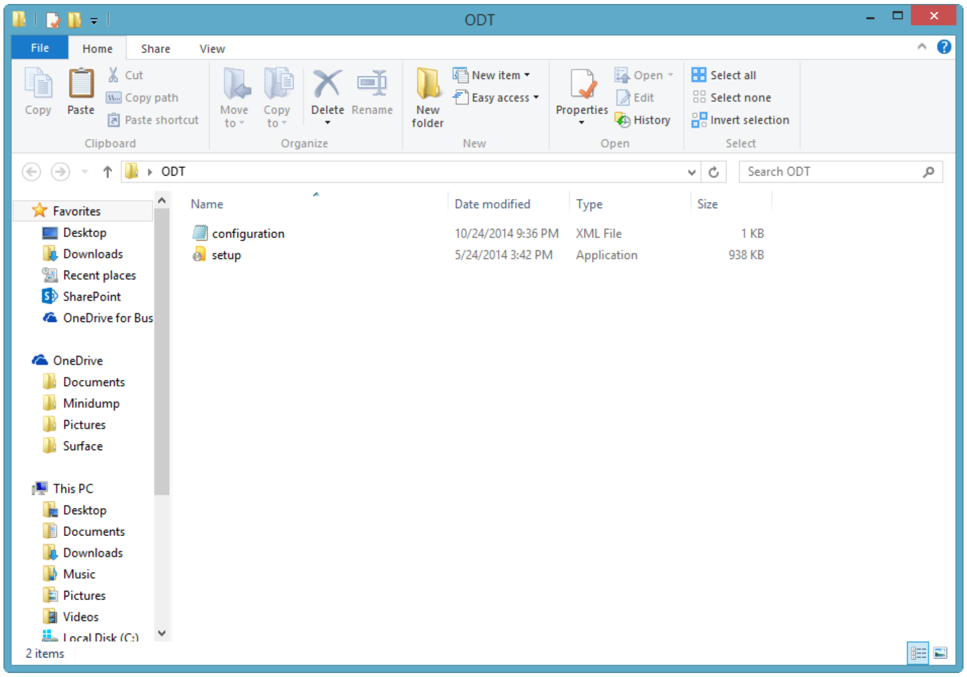
The power of Office. Everywhere. Start your free month of Office 365 now.

Figure 5.7: Office Deployment Tool Download Page.

To download a copy of the source files for use with MDT, follow these steps:

1. Create a folder named **Office15** and share it on the network.

2. Ensure your administrative user account has permission to write to this folder.
3. Download the **Office Deployment Tool** and place it in the **Office15** folder. There should be two files, **setup.exe** and **configuration.xml** as shown in Figure 5.8.



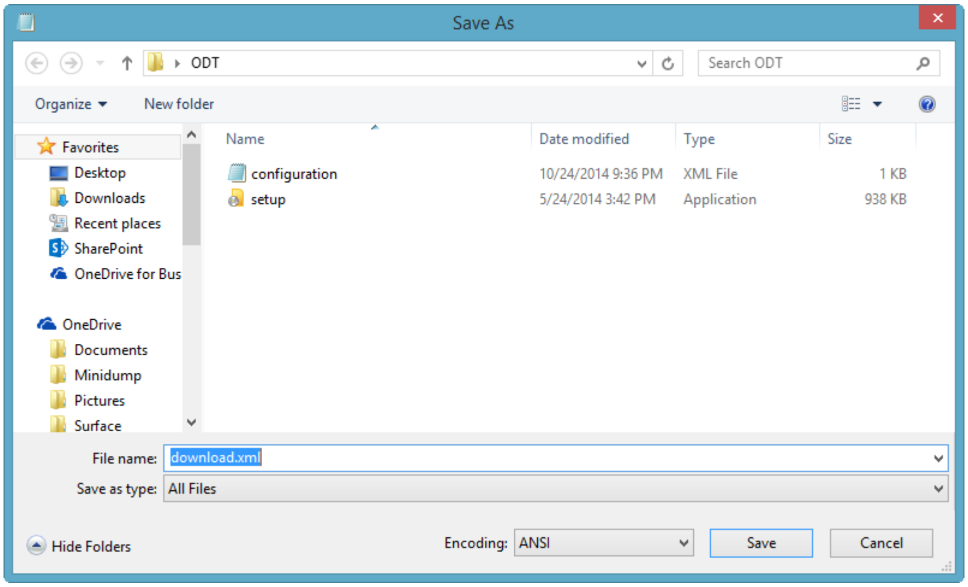
Name	Date modified	Type	Size
configuration	10/24/2014 9:36 PM	XML File	1 KB
setup	5/24/2014 3:42 PM	Application	938 KB

Figure 5.8: Office Deployment Tool Files.

4. Open **Notepad** and enter or copy the following, where the **SourcePath** specified is the share created in Step 1:

```
<Configuration>
   <Add SourcePath="\\sp3proddeploy\office15" OfficeClientEdition="32">
    <Product ID="O365ProPlusRetail" >
     <Language ID="en-us" />
    </Product>
   </Add>
</Configuration>
```

5. Select **Save As** from the **File** menu.
6. Select **All Files** from the **Save As Type** drop down menu as shown in Figure 5.9.



File name: download.xml

Save as type: All Files

Encoding: ANSI

Figure 5.9: Save As Type Drop Down Menu in Notepad.

7. Name the file **download.xml** and save it to the **Office15** folder.
8. Open a Command Prompt or a PowerShell session.
9. Enter the following command to run setup.exe with the download instruction and specifying the **download.xml** configuration file, then press **Enter**:

```
\\sp3proddeploy\office15\setup.exe /download
\\sp3proddeploy\office15\download.xml
```

10. When prompted, allow **Microsoft Office ClicktoRun** to run with administrative credentials.

The source files will be downloaded in the background and placed in the share specified by the **download.xml** configuration file. The specific product to be downloaded is also set by this configuration file, specifying the **Product ID** value of **O365ProPlusRetail**. If other products, such as Visio or Project, are required they can be specified with the applicable product IDs.

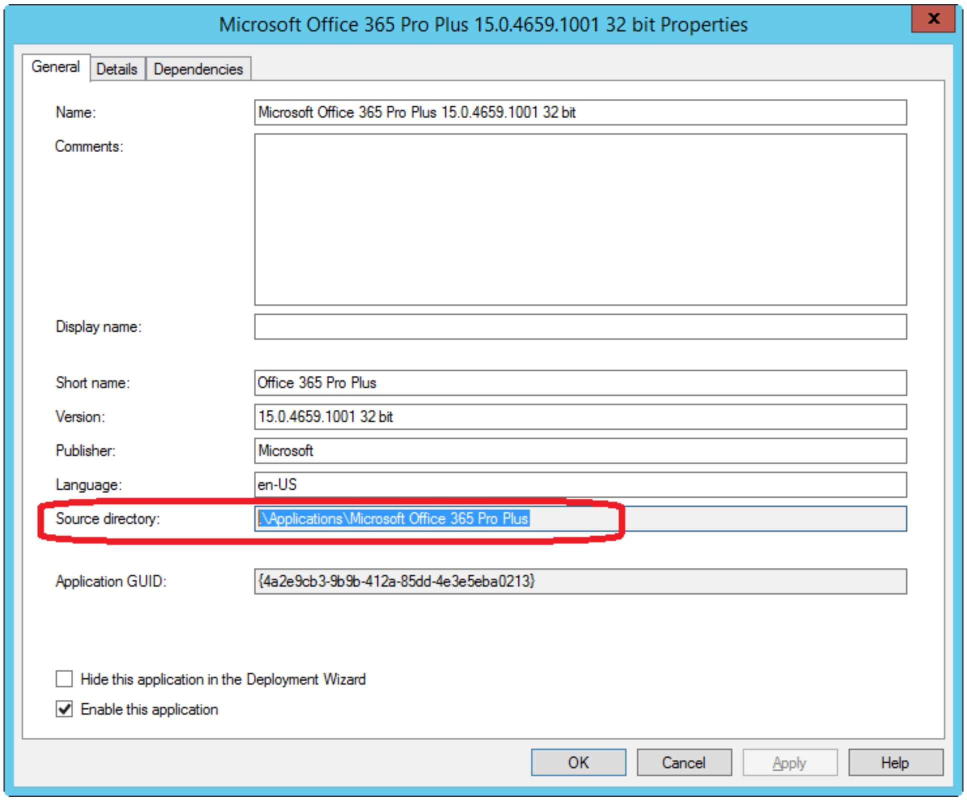
Now that the source files are downloaded, the configuration for deployment of Office with MDT must be set using another **configuration.xml** file. To do this, follow these steps:

1. Open **Notepad** and enter or copy the following.

```
<Configuration>
   <Add OfficeClientEdition="32">
    <Product ID="O365ProPlusRetail" >
     <Language ID="en-us" />
    </Product>
   </Add>
   <Display Level="None" AcceptEULA="TRUE" />
</Configuration>
```

2. Select **Save As** from the **File** menu.
3. Select **All Files** from the **Save As Type** drop down menu.
4. Name the file **MDT.xml** and save it to the **Office15** folder.

In this configuration file, no **SourcePath** value is specified. This is because the default behavior of **setup.exe** is to look for the source files in the path that contains **setup.exe**. This will be the directory shown in Figure 5.10, with the imported installation files which is placed locally on the deployed system. In the scenario that installation files are not found in this folder, setup.exe will default to the source files supplied by the **Content Delivery Network (CDN)** over the internet connection.



Microsoft Office 365 Pro Plus 15.0.4659.1001 32 bit Properties

Name: Microsoft Office 365 Pro Plus 15.0.4659.1001 32 bit
Comments:
Display name:
Short name: Office 365 Pro Plus
Version: 15.0.4659.1001 32 bit
Publisher: Microsoft
Language: en-US
Source directory: .\Applications\Microsoft Office 365 Pro Plus
Application GUID: {4a2e9cb3-9b9b-412a-85dd-4e3e5eba0213}

☐ Hide this application in the Deployment Wizard
☑ Enable this application

Figure 5.10: Microsoft Office Pro Plus 15 Properties Showing Source Directory.

In the configuration file, **Display Level** is set to a value of **None**. This setting is used to suppress the installation dialog box for silent installation. The **AcceptEULA** setting to **True** is required to accept the license agreement when **Display Level** is set to **None**.

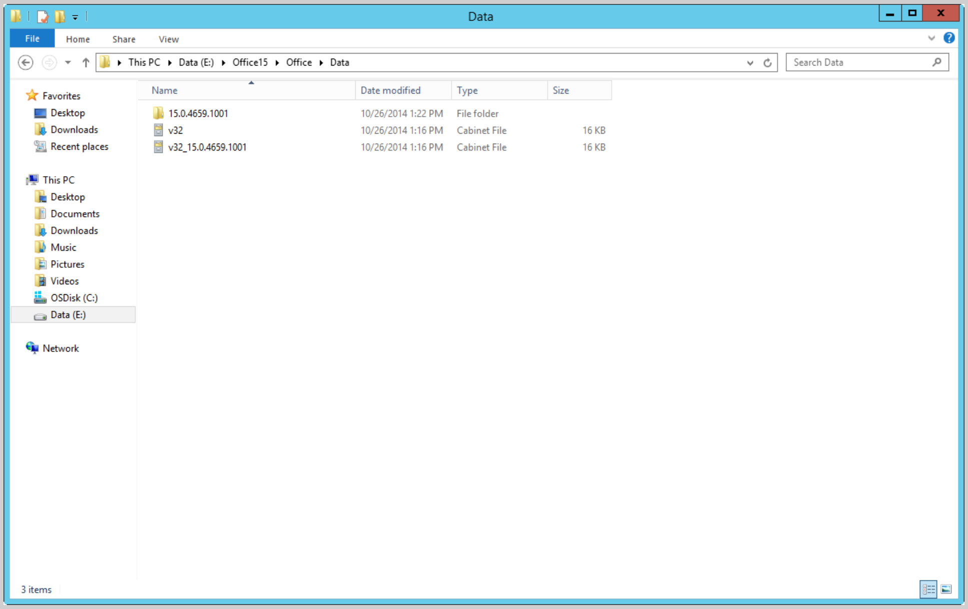
Note: Download.xml and **configuration.xml** can be removed from the share before proceeding to the next step to minimize extraneous files in the imported application and MDT deployment share.

Now that the installation and configuration files are prepared, the application can be imported into the deployment share by following these steps:

1. Open the MDT **Deployment Workbench**.

2. Expand the deployment share and select the **Applications** folder.
3. Select **New Application** from the **Actions** pane to launch the **New Application Wizard**.
4. The **New Application Wizard** presents the following steps:
   - **Application Type** – Select **Application with source files**, then click **Next**.
   - **Details** – Provide the following details to identify the application, then click **Next**:
     - **Publisher** – Enter **Microsoft**.
     - **Application Name** – Enter **Office 365 Pro Plus**.
     - **Version** – Enter **15.0.4659.1001 32 bit** or the version of your Microsoft Office installation files.

Note: The version number of your downloaded installation files can be seen in the name of the folder and cabinet file downloaded through the **Office Deployment Tool** in the **\Office\Data** subfolder of the share in which they were downloaded as shown in Figure 5.11.



Name	Date modified	Type	Size
15.0.4659.1001	10/26/2014 1:22 PM	File folder	
v32	10/26/2014 1:16 PM	Cabinet File	16 KB
v32_15.0.4659.1001	10/26/2014 1:16 PM	Cabinet File	16 KB

Figure 5.11: Office Version in Installation File Names.

     - **Language** – Enter **en-US** or the language of your Microsoft Office installation files.
   - **Source** – Specify or browse to the share in which the source files were downloaded, then click **Next**.
   - **Destination** – Specify a name for the folder in which to place the installation files, or leave the folder name default. Click **Next**.
   - **Command Details** – Provide the command which will be run to install the application. For Adobe Reader, use the following command to enable silent installation, then click **Next**:

```
setup.exe /configure mdt.xml
```

   - **Summary** – Confirm the summary of the options supplied for the application and click **Next**.
   - **Progress** – A progress bar is displayed during the import process.
   - **Confirmation** – A confirmation screen is displayed showing the success of the application import. Click **Finish** to exit the **New Application Wizard**.

Creating the Production Deployment Task Sequence

To perform the deployment, a new task sequence that specifies the selection profile needs to be created. In this task sequence, select the applicable image file, selection profile, and set the **CopyProfile** setting in the answer file. This new task sequence needs to use the ID that was specified for Surface Pro 3 models in the **customsettings.ini** file earlier in this chapter.

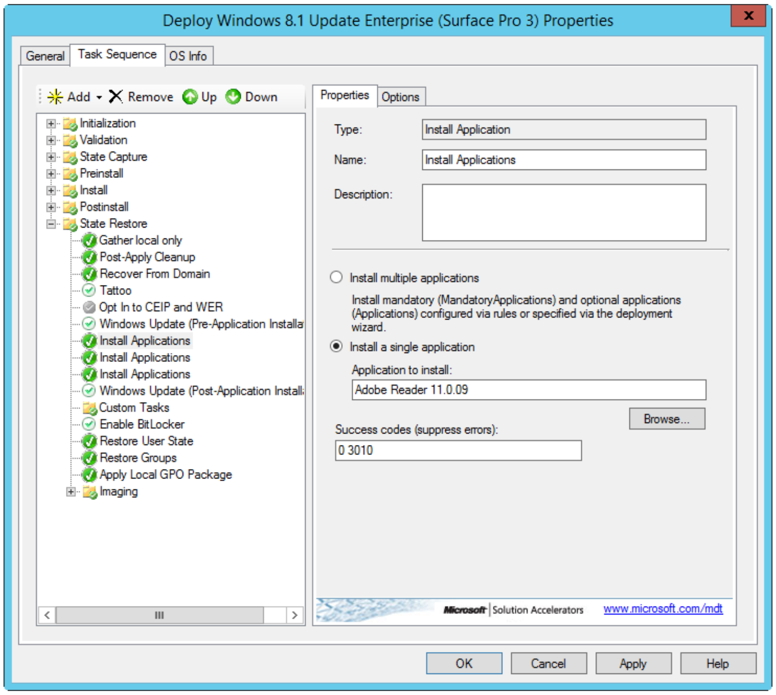
To create the production deployment task sequence, follow these steps:

1. Expand the deployment share in the **Deployment Workbench** and select the **Task Sequences** folder.
2. Select **New Task Sequence** from the **Actions** pane to launch the **New Task Sequence Wizard**.
3. The **New Task Sequence Wizard** presents the following steps:
   - **General Settings** – Enter **SP3Win8.1EntCst** as the **Task sequence ID** and a **Task sequence name**. Click **Next**.
   - **Select Template** – Select **Standard Client Task Sequence** from the dropdown list of predefined templates. Click **Next**.
   - **Select OS** – Select the custom image copied from the lab deployment share. Click **Next**.
   - **Specify Product Key** – If performing a deployment of a product licensed with a MAK key, specify it here. If performing a single deployment with this solution to a single Surface Pro 3 device, a retail key can be specified here. If using KMS activation or evaluation software in this deployment, leave **Do not specify a product key at this time** selected. Click **Next**.
   - **OS Settings** – Set the desired name and organization for registration and the desired home page, then click **Next**:
   - **Admin Password** – Enter a strong password for the local **Administrator** account. Click **Next**.
   - **Summary** – Review the summary of your new task sequence and click **Next**.
   - **Progress** – Displays a progress bar during the creation of the new task sequence.
   - **Confirmation** – Displays confirmation of success or errors generated while creating the task sequence. Click **Finish** to close the **New Task Sequence Wizard**.

Now that the task sequence is created and the proper image selected, the task sequence must be configured to use the selection profile for driver installation and to install the desired applications. The task sequence can also be configured to install updates at the time of deployment to ensure a fully up-to-date environment upon completion. To ensure that the drivers for Surface Pro 3 are installed at the time of deployment, follow the steps from the Configuring Driver Selection section of Chapter 3.

To configure mandatory (required) applications for installation during the task sequence, each application must be specified as a separate step by following this process:

1. Right-click the production deployment task sequence and select **Properties**.
2. Select the **Task Sequence** tab.
3. Expand the **State Restore** folder and select the **Install Applications** step.
4. Right-click the **Install Applications** step and select **Copy**.
5. Right-click the **State Restore** folder and select **Paste**, then repeat to create a total of three **Install Applications** steps as shown in Figure 5.12.



Deploy Windows 8.1 Update Enterprise (Surface Pro 3) Properties

General | Task Sequence | OS Info

Add ▾ | Remove | Up | Down

- Initialization
- Validation
- State Capture
- Preinstall
- Install
- Postinstall
- State Restore
  - Gather local only
  - Post-Apply Cleanup
  - Recover From Domain
  - Tattoo
  - Opt In to CEIP and WER
  - Windows Update (Pre-Application Installa
  - Install Applications
  - Install Applications
  - Install Applications
  - Windows Update (Post-Application Install
  - Custom Tasks
  - Enable BitLocker
  - Restore User State
  - Restore Groups
  - Apply Local GPO Package
  - Imaging

Properties | Options

Type: Install Application

Name: Install Applications

Description:

○ Install multiple applications

Install mandatory (MandatoryApplications) and optional applications (Applications) configured via rules or specified via the deployment wizard.

● Install a single application

Application to install: Adobe Reader 11.0.09

Browse...

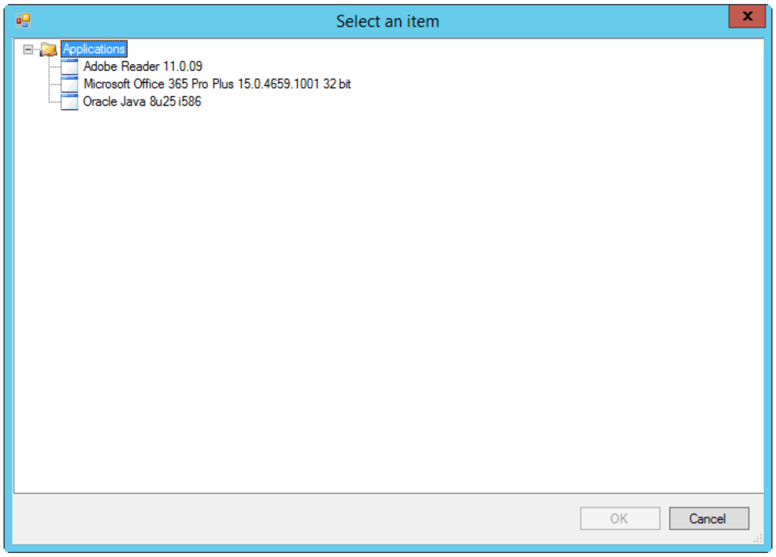
Success codes (suppress errors): 0 3010

Microsoft | Solution Accelerators www.microsoft.com/mdt

OK | Cancel | Apply | Help

Figure 5.12: Three Install Applications Steps.

6. Select the first **Install Applications** step.
7. Change the name of the step to **Install Application (Adobe Reader)**.
8. Change the setting **Install multiple applications** to **Install a single application** as shown in Figure 5.13, then select **Browse** and chose Adobe Reader from the list of available applications.



Select an item

- Applications
  - Adobe Reader 11.0.09
  - Microsoft Office 365 Pro Plus 15.0.4659.1001 32 bit
  - Oracle Java 8u25 i586

OK | Cancel

Figure 5.13: Install Application (Adobe Reader) Step.

9. Select the second **Install Applications** step.
10. Change the name of the step to **Install Application (Oracle Java)**.

11. Change the setting **Install multiple applications** to **Install a single application**, then select **Browse** and chose **Oracle Java** from the list of available applications.
12. Select the third **Install Applications** step.
13. Change the name of the step to **Install Application (Microsoft Office)**.
14. Change the setting **Install multiple applications** to **Install a single application**, then select **Browse** and chose Microsoft Office from the list of available applications.

To configure Windows Updates during the deployment process, follow these steps:

1. Right-click the production deployment task sequence and select **Properties**.
2. Select the **Task Sequence** tab.
3. Select the **Windows Update (Pre-Application Installation)** step prior to the **Install Applications** steps used in the previous section.
4. Select the **Options** tab.
5. Uncheck the **Disable this step** checkbox.
6. Repeat steps 1-3 for the **Windows Update (Post-Application Installation)** step after the **Install Applications** steps used in the previous section.
7. Configure the CopyProfile setting in the answer file for the task sequence by following the procedure in the Creating the Test Deployment Task Sequence section in Chapter 4.

The task sequence for deployment is now ready to be used as a full-featured deployment solution producing a configured computer, joined to the domain, and ready to be used.

Testing the Production Deployment

Now that this deployment is ready for Surface Pro 3 devices connected to the corporate or organizational network, it is highly recommended to perform a test deployment to verify the success of the task sequence.

Note: If you have not already updated the deployment share to generate updated boot media or imported this boot image into WDS using the steps provided in the Preparing Boot Media section of Chapter 3, these steps are required before network boot.

To boot the Surface Pro 3 from the network with the Surface Ethernet Adapter or the docking station, follow these steps:

1. Press and hold the Volume Down button.
2. Press and release the Power button.
3. When the text **Checking Media Presence……** appears, the volume down button can be released.
4. Press **Enter** for network boot when prompted.

The MDT boot media will launch, detect the model of the system, and automatically determine the task sequence based off the instructions provided in the deployment share rules. After having pressed **Enter** for network boot, no further interaction will be required. All data required by the **Windows Deployment Wizard** has already been supplied, and therefore will not appear. The **Installation Progress** window will appear to show the progress of the deployment as it processes the steps of applying the image, installing applications, and installing Windows Updates.

Upon completion, the **Installation Progress** window will close and the computer will be left ready for use logged in as the local administrator account. The computer will be joined to the domain, so an end-user only needs log in to begin using the computer.

Creating the Offline Deployment Share

Now that the production deployment share is running and ready for deployment to computers connected to the network, the next step is to create the offline deployment share. The offline deployment share will be linked to the production deployment share and used to create offline media for deployment to systems which are not connected to the network.

A separate offline deployment share will be used for two primary reasons:

1. To keep the size of stored components down to minimize storage requirements of the USB stick that will be used as offline media.
2. To specify different deployment share rules. For example, without network connectivity, domain join will fail, so in the offline deployment share the Windows Deployment Wizard will be configured to join the computer to a workgroup instead of a domain. Another example is to leave at least one prompt to ensure that an accidental boot to the USB stick does not overwrite the operating system if it was accidentally inserted into an unintended computer.

Follow the procedure outlined in the Creating a Deployment Share section of Chapter 3 to create the offline deployment share.

The offline deployment share can be created alongside the production deployment share on the same server, so that once created the deployment server could have three deployment shares open. The deployment workbench can open deployment shares from either a local drive or a network location, as shown in Figure 5.14.

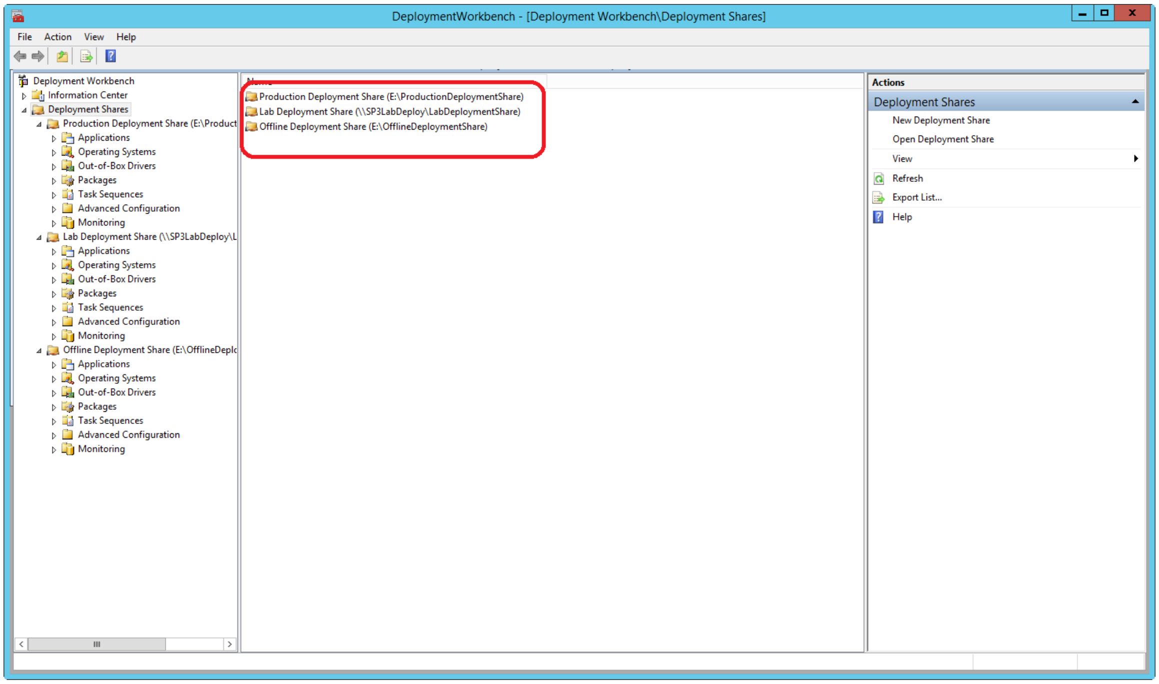


Figure 5.14: Deployment Workbench Showing Three Deployment Shares.

Linking the Deployment Shares

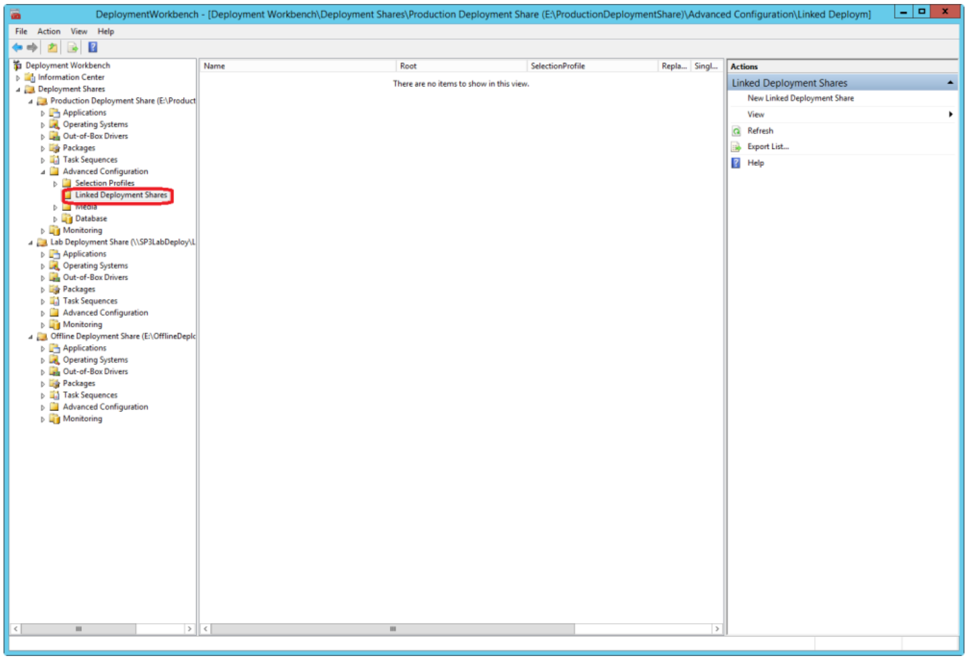
After the offline and production deployment shares are open side-by-side, the components from the production deployment share will need to be copied to the offline deployment share. This can be done manually, through **Copy** and **Paste,** as was done between the lab deployment share and production deployment share, or can be done through automated means via linked deployment shares.

To link the offline deployment share to the production deployment share and to copy the necessary components, follow these steps:

1. Open the **Deployment Workbench** and expand the production deployment share.

   Note: Linked deployment shares must be initiated from the source deployment share whose contents will be copied to another target deployment share. Linked deployment shares cannot be initiated from the target deployment share.

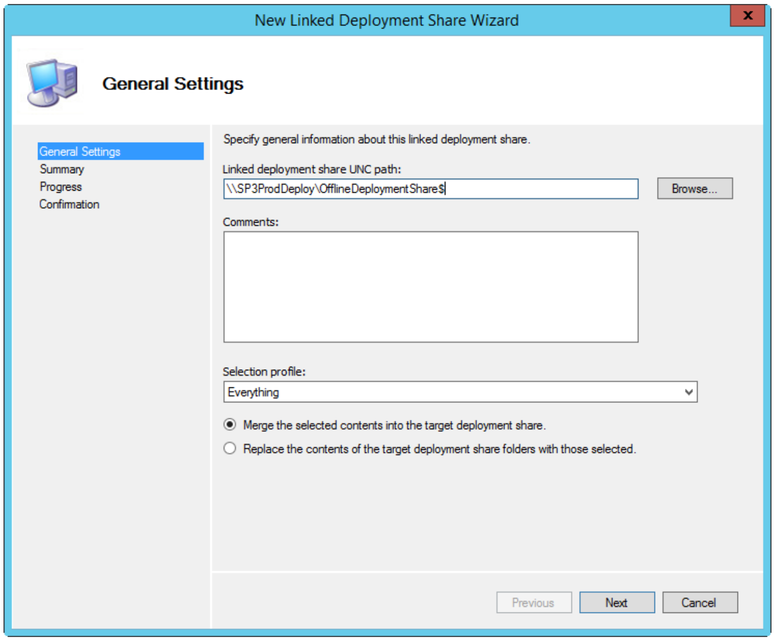
2. Expand the **Advanced Configuration** folder and select the **Linked Deployment Shares** folder as shown in Figure 5.15.



There are no items to show in this view.

Figure 5.15: Deployment Workbench Showing Linked Deployment Share Folder.

3. Select **New Linked Deployment Share** from the **Action** pane to launch the **New Linked Deployment Share Wizard**.
4. The **New Linked Deployment Share Wizard** presents the following steps:
   - **General Settings** – Configure the name, selection profile, and replication method for the linked deployment share through the following options as shown in Figure 5.16, then click **Next**.



Specify general information about this linked deployment share.

Linked deployment share UNC path: \\SP3ProdDeploy\OfflineDeploymentShare$

Comments:

Selection profile: Everything

● Merge the selected contents into the target deployment share.

○ Replace the contents of the target deployment share folders with those selected.

Figure 5.16: Linked Deployment Share Wizard Options.

- **Linked deployment share UNC path** – Enter or browse to the location of the offline deployment share.

  > **Note**: The location used here must be the network share location, not the local location. For example, use **\\SP3ProdDeploy\OfflineDeploymentShare$**. Do not use: **E:\OfflineDeploymentShare**

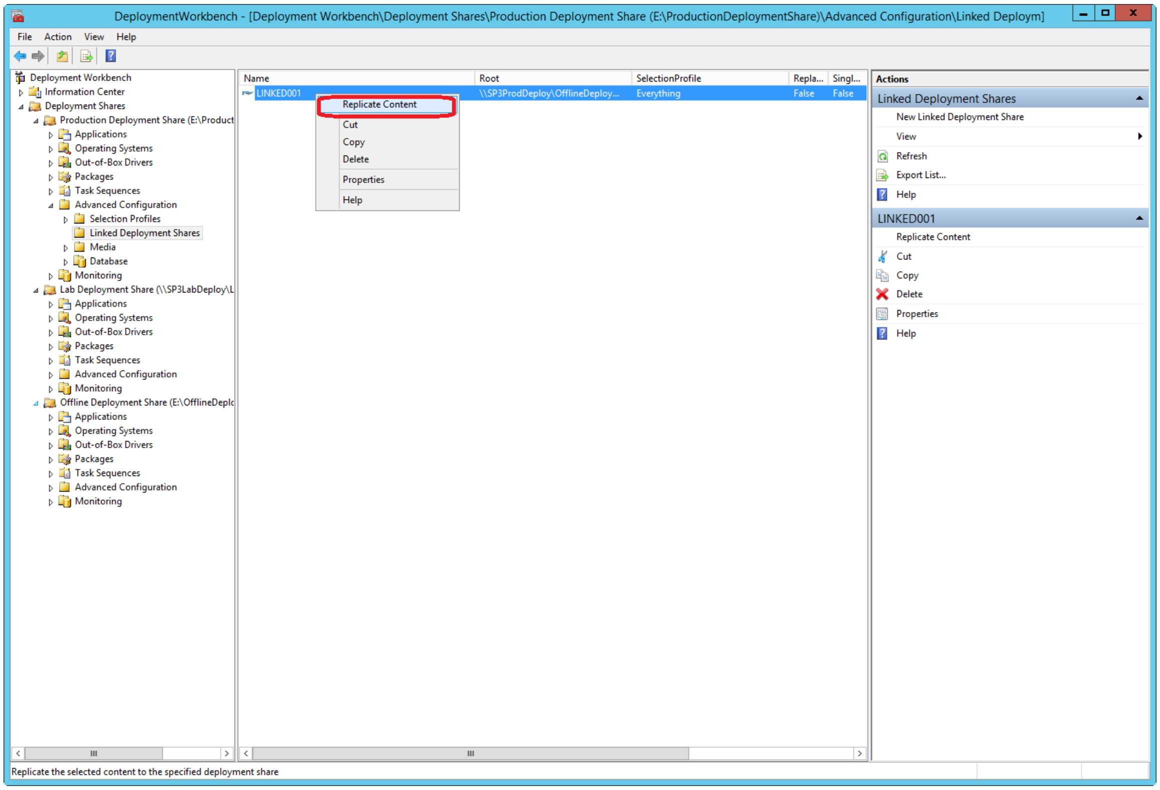
- **Comments** – Enter any desired comments for the linked deployment share.
- **Selection Profile** – Select the **Everything** selection profile from the drop down menu.

  > **Note:** Alternatively, the task sequences, applications, images, and drivers could all be specified in the **Surface Pro 3 Win 8.1 x64** selection profile and this selection profile could be selected here. This is beneficial in scenarios where the production deployment share contains other computer models or applications not desired in the offline media.

- **Replication Method** – Select the **Merge the selected contents into the target deployment share** option to indicate that components from the production share should be added to the offline deployment share. Alternatively, to replace all components in the offline deployment share, select the **Replace the contents of the target deployment share folders with those selected** option.

- **Summary** – Confirm the specified options and click **Next**.
- **Progress** – A progress bar will be displayed as the link is created.
- **Confirmation** – Confirmation of the successful link of the deployment share will be displayed here. Click **Finish**.

5. Right-click the linked deployment share item **LINKED001** and select **Replicate Content** as shown in Figure 5.17, which launches the **Replicate to Linked Deployment Share** dialog box.



DeploymentWorkbench - [Deployment Workbench\Deployment Shares\Production Deployment Share (E:\ProductionDeploymentShare)\Advanced Configuration\Linked Deploym]

Name	Root	SelectionProfile	Repla...	Singl...
LINKED001	\\SP3ProdDeploy\OfflineDeploy...	Everything	False	False

Replicate the selected content to the specified deployment share

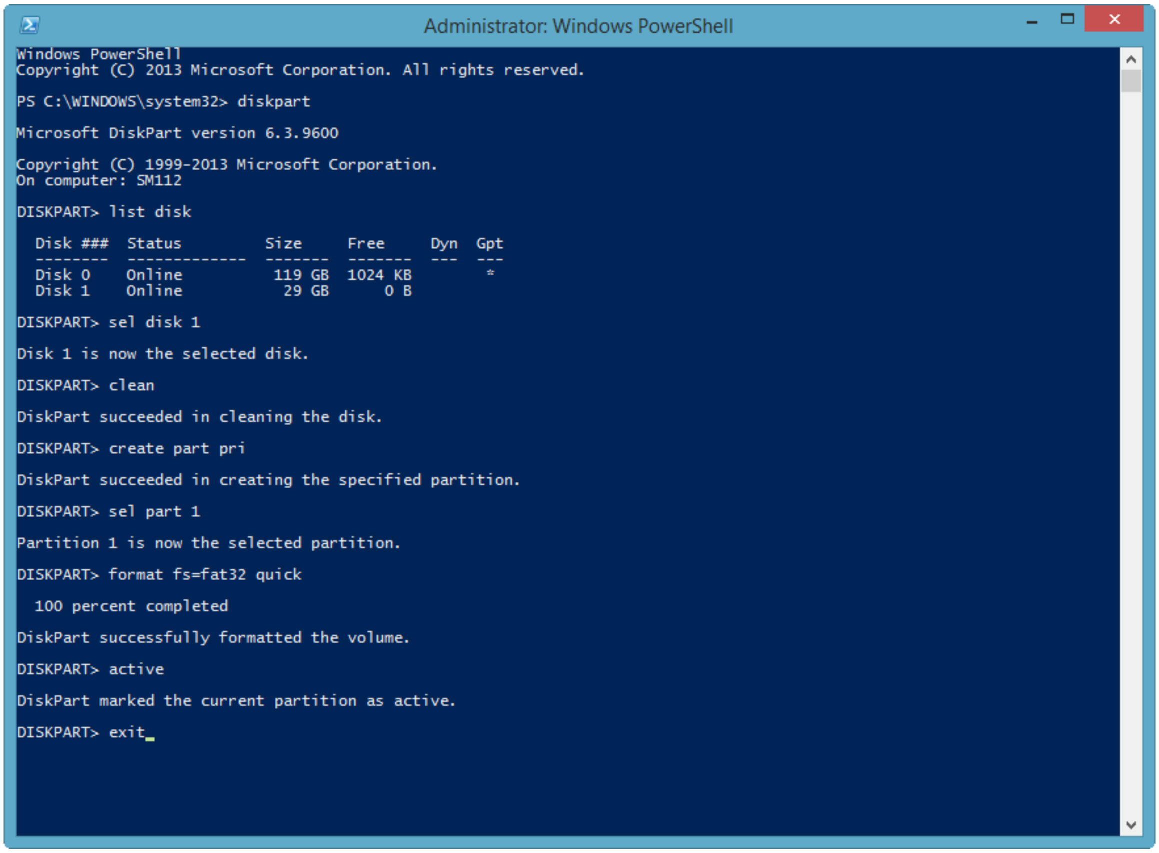
Figure 5.17: Deployment Workbench Showing Replicate Content Menu Option.

6. The **Replicate to Linked Deployment Share** dialog box displays a progress bar on the **Progress** screen as replication is performed.
7. The **Confirmation** screen is displayed to report successful replication. Click **Finish** to close the **Replicate to Linked Deployment Share** dialog box.

The custom image, drivers, applications, and task sequence for deployment of Surface Pro 3 devices should now be present in the offline deployment share.

Preparing a USB Stick for Boot

To prepare your USB stick to be bootable, it must be partitioned, formatted, and the partition set as active by using the **Diskpart** Command-Line Utility, as shown in Figure 5.18.



```
Windows PowerShell
Copyright (C) 2013 Microsoft Corporation. All rights reserved.

PS C:\WINDOWS\system32> diskpart

Microsoft DiskPart version 6.3.9600

Copyright (C) 1999-2013 Microsoft Corporation.
On computer: SM112

DISKPART> list disk

  Disk ###  Status         Size     Free     Dyn  Gpt
  --------  -------------  -------  -------  ---  ---
  Disk 0    Online          119 GB  1024 KB        *
  Disk 1    Online           29 GB      0 B

DISKPART> sel disk 1

Disk 1 is now the selected disk.

DISKPART> clean

DiskPart succeeded in cleaning the disk.

DISKPART> create part pri

DiskPart succeeded in creating the specified partition.

DISKPART> sel part 1

Partition 1 is now the selected partition.

DISKPART> format fs=fat32 quick

  100 percent completed

DiskPart successfully formatted the volume.

DISKPART> active

DiskPart marked the current partition as active.

DISKPART> exit_
```

Figure 5.18: Partitioning and Formatting with Diskpart Command-Line Utility.

To prepare a USB stick, follow this procedure:

1. Plug your USB stick into the computer. You can use any computer to perform this task, for example your workstation or the production deployment server.
2. Open **Command Prompt** or **PowerShell** as an Administrator.

3. Enter the following command and press **Enter** to launch the Diskpart Command-Line Utility:
   ```
   diskpart
   ```

4. Enter the following command and press **Enter** to list the disks on the computer:
   ```
   list disk
   ```

5. Select the disk number that corresponds with your USB stick by entering the following command and pressing **Enter**, where X is the disk number:
   ```
   sel disk X
   ```

6. Enter the following command and press **Enter** to wipe any existing configuration from the USB stick. This will remove any existing data from the selected disk.
   ```
   clean
   ```

7. Enter the following command and press enter to create a single primary partition on the USB stick:
   ```
   create part pri
   ```

8. Select this partition by entering the following command and pressing **Enter**.
   ```
   sel part 1
   ```

9. Format the partition with the FAT32 file system by entering the following commands and pressing **Enter**.
   ```
   format fs=fat32 quick
   ```
   Note: The FAT32 file system is required for compatibility with UEFI systems.

10. Make the partition active by entering the following command and pressing **Enter**.
    ```
    active
    ```

11. Type the following and press **Enter** to exit the Disk Partitioning Utility.
    ```
    Exit
    ```

Note: In many circumstances, a custom image can be larger than the 4GB limit of the FAT32 file system required for UEFI. In these scenarios, a USB drive that reports as a fixed drive, such as a Windows To Go certified USB drive, is required to allow multiple partitions. The primary partition that holds most of the MDT boot files can be formatted FAT32, but a second partition formatted NTFS can be used to hold the majority of the Deploy folder. The Deploy\Boot folder must remain on the FAT32 partition.

Generating Offline Media Files

Now that the USB stick file system and partitioning is prepared for boot, you must provide the files which will be booted. To generate these boot files for offline media, follow these steps:

1. Expand the **Advanced Configuration** section of the offline deployment share in the **Deployment Workbench**.
2. Select the **Media** folder.
3. Select **New Media** from the **Action** pane to launch the **New Media Wizard**.
4. The **New Media Wizard** presents a series of steps:

- **General Settings** – Enter the following configuration for the offline media and then click **Next**.
- **Media Path** – Enter or browse to the location where the offline media should be created. This location should be outside the deployment share.
- **Comments** – Enter any desired comments for the offline media.
- **Selection Profile** – Select the **Everything** selection profile to include all content from the offline deployment share in the offline media. In a deployment share with multiple computer models, specific selection profiles can be used from this menu to create targeted offline media.
- **Summary** – Confirm the options selected on the General Settings page and click **Next**.
- **Progress** – Displays a progress bar as the offline media is generated.
- **Confirmation** – Provides confirmation of the successful creation of the offline media files. Click **Finish**.

Configuring Offline Media Rules

Offline media uses rules that are separate from the rules of the deployment share. Each set of offline media files includes separate **bootstrap.ini** and **customsettings.ini** files. To customize these rules for the offline media deployment process, follow these steps:

1. Right-click the production deployment share in the **Deployment Workbench** and select Properties.
2. Select the **Rules** tab, highlight the contents, right-click and select **Copy**.
3. Expand the **Advanced Configuration** folder of the offline deployment share and select the **Media** folder.
4. Right-click **MEDIA001**, the newly created offline media files, and select **Properties** as shown in Figure 5.19.

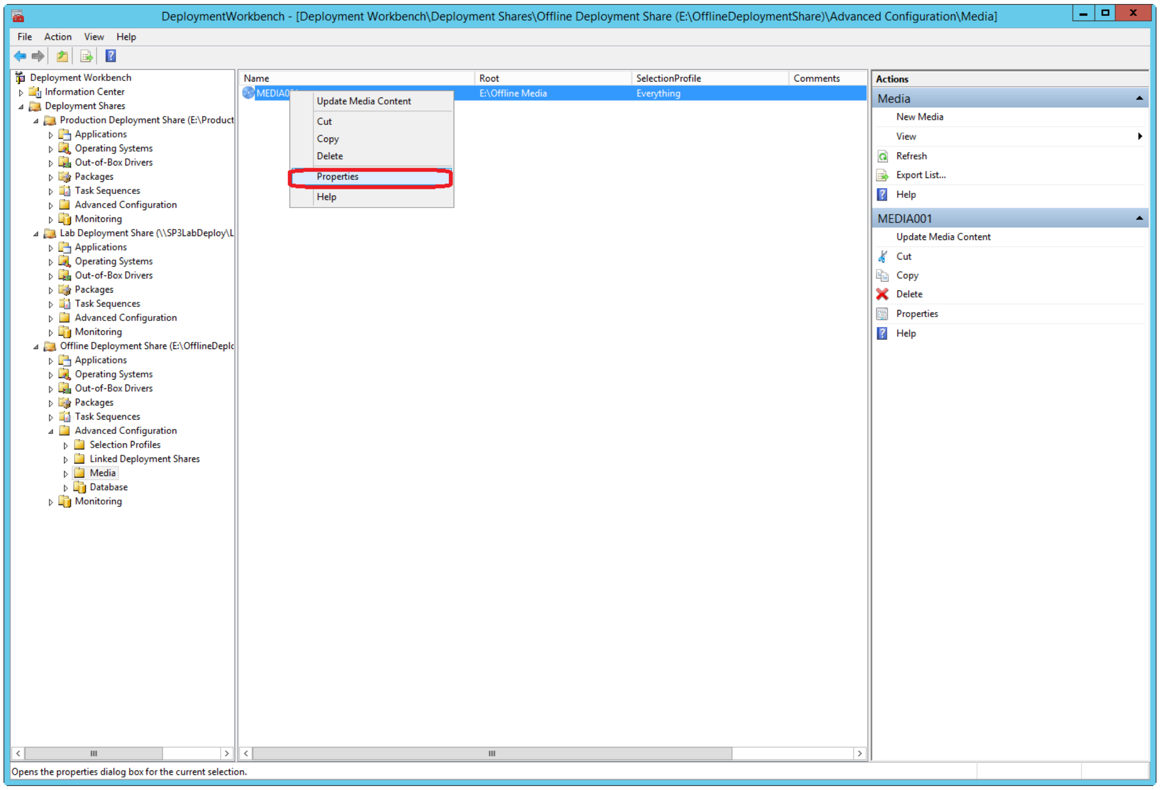


Figure 5.19: Deployment Workbench Showing the Offline Media Properties Menu Option.

5. Select the **Rules** tab and highlight the contents.

6. Right-click and select **Paste** to overwrite the offline media rules.
7. Alter the following settings:
   - **JoinDomain** – Replace the **JoinDomain** setting with **JoinWorkgroup**=WORKGROUP and remove the associated **DomainAdmin**, **DomainAdminDomain**, and **DomainAdminPassword** settings. A system without connectivity to the corporate network will be unable to join the domain and will fail if **JoinDomain** is specified.
   - **SkipSummary** – Change the **SkipSummary** setting from **YES** to **NO**. When complete automation of the offline media is configured by skipping all of the Windows Deployment Wizard prompts, the offline media will begin deployment and overwrite any existing operating system or data upon boot. To prevent this from occurring unintentionally if the USB stick is accidentally booted, the **Summary** page will not be skipped. This will require minimal user interaction to provide confirmation by clicking **Next** before performing the deployment.
8. Close the offline media properties.

The rules should now match the text shown in Listing 5.3:

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

[Surface Pro 3]
SkipTaskSequence=YES
TaskSequenceID=SP3Win8.1EntCst

[Default]
OSInstall=Y
SkipCapture=YES
SkipAdminPassword=YES
SkipProductKey=YES
SkipComputerBackup=YES
SkipBitLocker=YES
SkipBDDWelcome=YES
SkipUserData=YES
UserDataLocation=AUTO
SkipApplications=YES
SkipPackageDisplay=YES
SkipComputerName=YES
SkipDomainMembership=YES
JoinWorkgroup=WORKGROUP
SkipLocaleSelection=YES
KeyboardLocale=en-US
UserLocale=en-US
UILanguage=en-US
SkipTimeZone=YES
TimeZoneName=Pacific Standard Time
UserID=MDT
UserDomain=SP3ProdDeploy
UserPassword=P@ssw0rd
```

```
SkipSummary=NO
SkipFinalSummary=YES
```

Listing 5.3: Offline Media Rules.

Add the **SkipBDDWelcome** setting to the **Bootstrap.ini** file by following the procedure detailed in the Configuring Boot Media Rules section of Chapter 4. The credentials settings do not need to be configured because the offline boot media will not connect to a separate deployment share.

Finalizing the Offline Media

Now that the rules are configured, the offline media can be updated to include these rules and the deployment share components required for deployment. Updating the offline media will also generate an ISO image file which can be burned to optical media or mounted to virtual machines. To update the offline media, follow these steps:

1. Expand the **Advanced Configuration** folder of the offline deployment share in the **Deployment Workbench**.
2. Select the **Media** folder.
3. Right-click **MEDIA001**, the newly generated offline media files, and select **Update Media Content**. This launches the **Update Media Content** process.
4. The **Update Media Content** process will run, displaying the following screens:
   - **Progress –** Progress bars will be displayed throughout the process of copying content from the deployment share into the offline media files.
   - **Confirmation –** Displays confirmation of the successful update of the offline media and a summary of the process. Click **Finish**.
5. Open File Explorer.
6. Enter or browse to the location of the offline media files.
7. Open the **Content** folder.
8. Select all of the files and folders as shown in Figure 5.20, then right-click on the files and folders and select **Copy**.

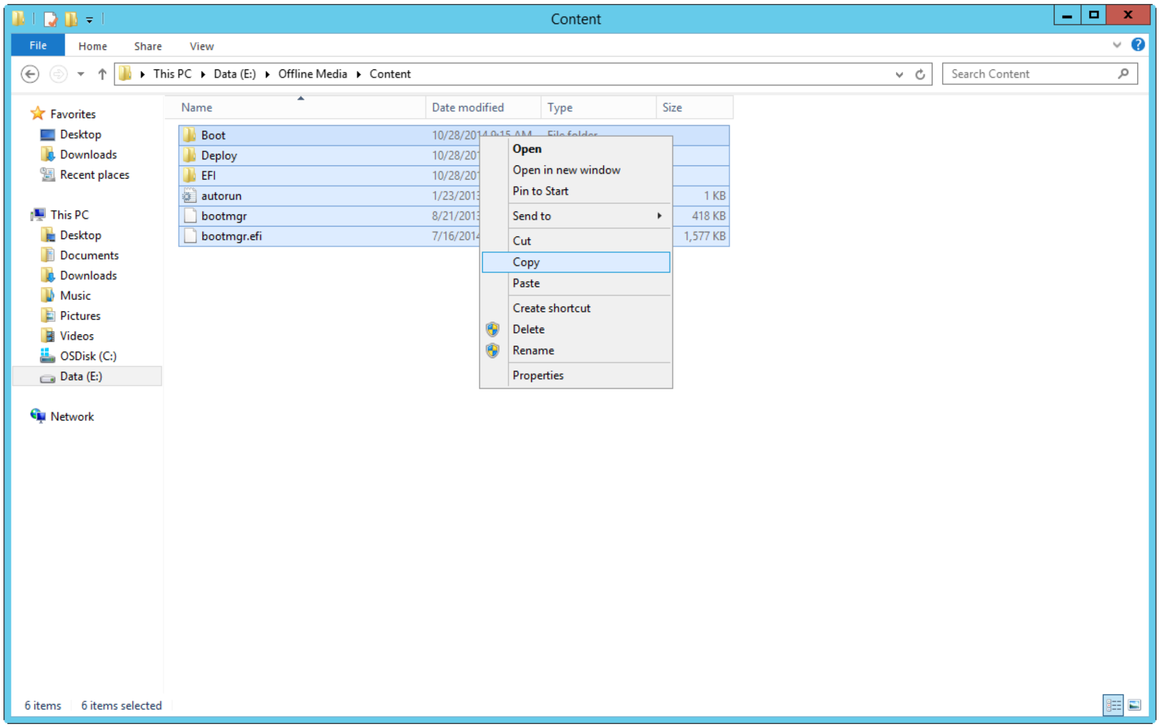


Figure 5.20: Offline Media Files Selected.

9. Enter or browse to the location of the prepared USB stick.
10. Right-click the prepared USB stick and select **Paste**. This will copy the boot files for the USB stick.

The USB stick is now ready to be booted and to perform the deployment.

Deploying from Offline Media

On the target Surface Pro 3 device, follow these steps to boot from the USB stick and perform the deployment:

1. Shut down the device if it is running, ensure that the Surface Pro 3 is off before proceeding.
2. Plug in the USB stick.
3. Press and hold the **Volume Down** button.
4. Press and release the **Power** button.
5. Once the offline media has begun to boot, the **Volume Down** button can be released.
6. The **Windows Deployment Wizard** will automatically launch and present the **Summary** page.
7. Click **Next** to confirm the pre-configured options and begin the deployment.
8. The **Installation Progress** dialog box will appear and several progress bars will be displayed throughout the deployment as the various processes defined in the task sequence are run.

Note: The touchscreen of the Surface Pro 3 is not enabled during WinPE. A secondary input method must be provided to click the **Next** button on the **Summary** page. This secondary input method could include the **Surface Pro Type Cover** or a keyboard or mouse connected through the **Surface Pro 3 Docking Station** or a USB hub.

After the deployment process is complete, the **Installation Progress** dialog box will automatically close and your Surface Pro 3 device will be ready for use. Your Surface Pro 3 will include the customizations that were made to the image in Chapter 4, such as the configured Start Screen and wallpaper. All of the devices and components of your Surface Pro 3 will function as intended using the installed drivers. The apps you specified, which if you followed the steps in this chapter, include Adobe Reader, Oracle Java, and Microsoft Office 365 Professional Plus, will be available for use in the deployed environment. Your Surface Pro 3 is now ready for end users.

The offline media is now ready for distribution to users with remote systems. The USB stick can be duplicated and shipped to end users. The end users will follow the **Deploying from Offline Media** process to boot to the USB stick and confirm the deployment. As a result, their Surface Pro 3 devices will be deployed with the corporate image and be ready for them to begin work.

Chapter 6 – Automated Deployment with SCCM

Unlike the lite-touch scenarios covered in Chapter 3, Chapter 4, and Chapter 5 that all use the Microsoft Deployment Toolkit, the automated deployment scenario covered in this chapter uses zero-touch installation (ZTI) and System Center Configuration Manager (SCCM) as the primary deployment tool. The Microsoft Deployment Toolkit is integrated with SCCM to provide additional functionality and capabilities.

While MDT is a very powerful deployment solution that theoretically can deploy an unlimited number of computers, for organizations with a large number of computers, manageability of MDT can become quite complex. Some examples of limitations of MDT that can be resolved with SCCM include:

- Folder replication between distribution points. MDT stores the components and settings used during deployment on a network share. This is a reliable solution and is easy to configure for a single site, but for organizations with many sites, replication of these network shares can become very difficult to manage.
- Ability to deploy a zero-touch installation. Deployment with MDT can be highly automated, but even an entirely automated MDT lite-touch deployment requires a user or technician to initiate the process on a target computer. For example, the technician may need to press **Enter** to boot from the network. SCCM can initiate and perform the entire deployment process on a client system without any user interaction.
- Customizing the deployment wizard experience beyond the settings available in the **customsettings.ini** file in MDT. This is known as a *user-driven installation* (UDI). UDI is not covered in this guide.

Although SCCM can be used to streamline deployment to large numbers of computers, MDT is still recommended as the preferred solution for *creation* of images for deployment. The image used in the automated deployment scenario with SCCM outlined in this chapter is the reference image generated in the reference deployment scenario from Chapter 4.

SCCM on its own is also a powerful deployment solution, but integration with MDT enables the best of both tools. MDT brings a large number of enhancements to SCCM including:

- Dynamic rules that enable the deployment to fit the characteristics of the environment, for example, adding a specific application for a specific model of computer, like battery management software for a specific make or model of notebook.
- MDT enables real-time monitoring of the deployment process.
- Templates for common deployment scenarios that simplify the task sequence creation process.

While the deployment process described in this scenario can be used to deploy to any number of computers, this chapter focuses on three specific computers as shown in Figure 6.1:

- SCCM Server
  - System Center Configuration Manager (SCCM) 2012 R2
  - Windows Assessment and Deployment Kit (Windows ADK)

    - Microsoft Deployment Toolkit (MDT)
    - Windows Deployment Services (WDS)
- Managed Surface Pro 3
    - Domain Joined
    - System Center Configuration Manager (SCCM) Client
- New/Vanilla Surface Pro 3
    - Not Domain Joined
    - No SCCM Client

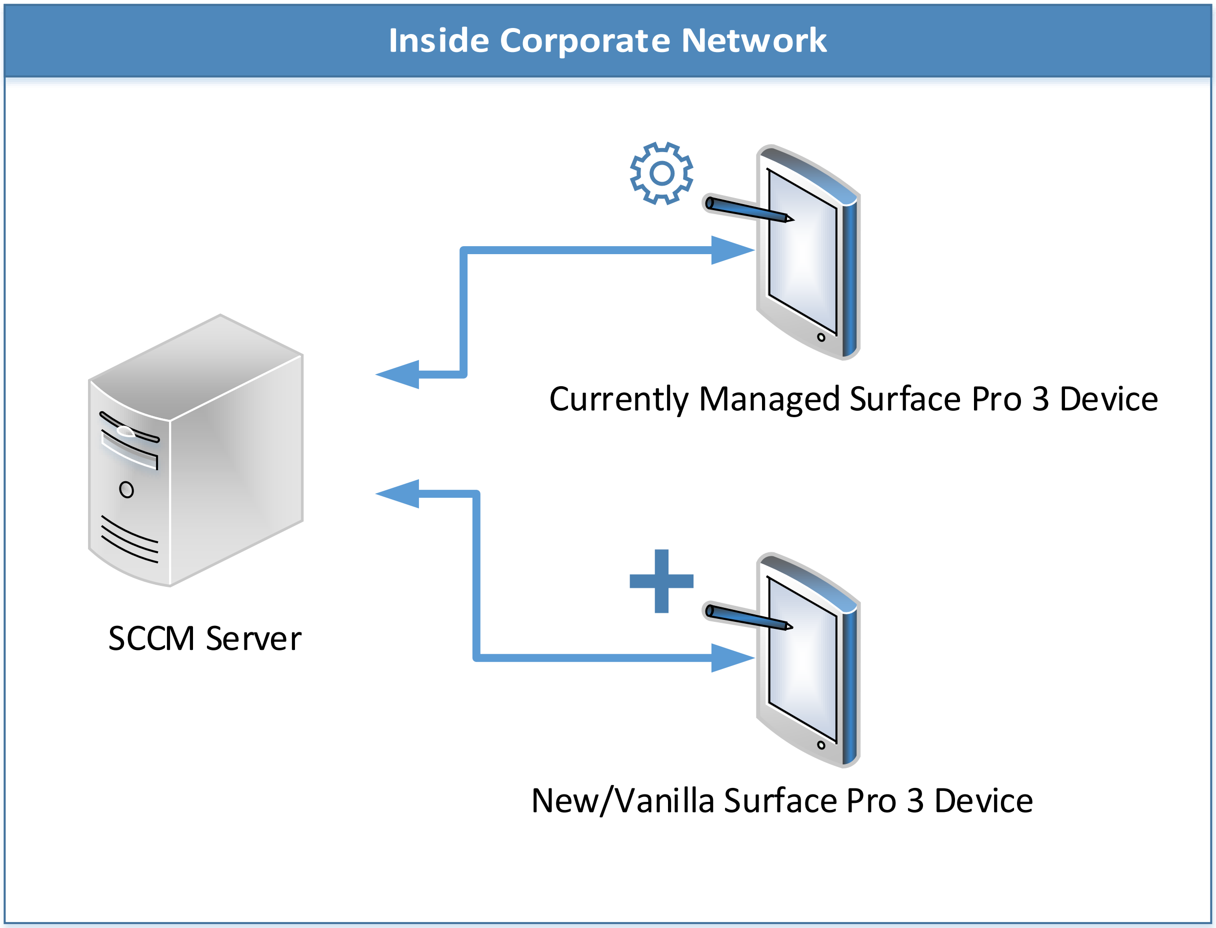

Inside Corporate Network
Currently Managed Surface Pro 3 Device
SCCM Server
New/Vanilla Surface Pro 3 Device

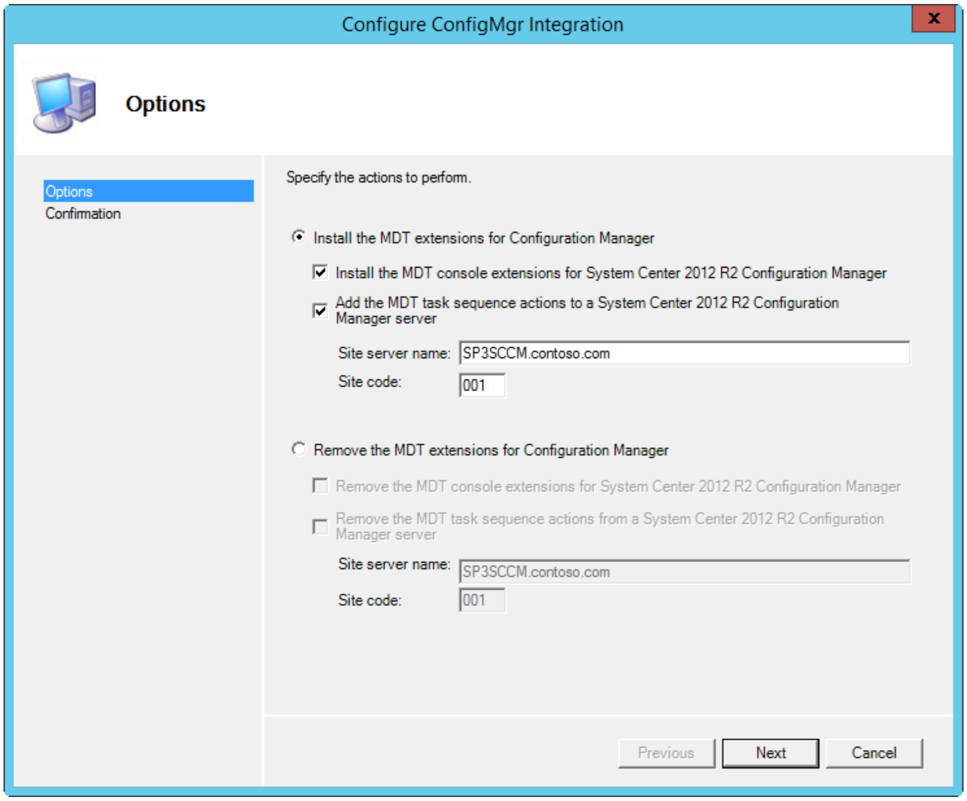
Figure 6.1: Computers for Automated Deployment Scenario with SCCM.

Not covered in this chapter is the process of installing and configuring SCCM, creating boundaries and adding devices to SCCM, configuring installation of the SCCM client, or importing and deploying applications with SCCM. Links to further information regarding these topics are provided in the Appendix of this guide.

Integrating MDT with SCCM

Before the deployment process can be configured, the MDT components will need to be added to SCCM. This is done through a wizard, named **Configure ConfigMgr Integration**, which is launched outside of either tool. To integrate MDT with SCCM, follow these steps:

1. Launch the **Configure ConfigMgr Integration** wizard from the Start Screen under **Microsoft Deployment Toolkit** on your SCCM server.
2. The **Configure ConfigMgr Integration** wizard presents the following options:
   - **Options** – Select the following options as shown in Figure 6.2, then click **Next**.
     - Check the **Install the MDT console extensions for System Center 2012 R2 Configuration Manager** check box.
     - Check the **Add the MDT task sequence actions to a System Center 2012 R2 Configuration Manager server** check box.
     - **Site server name** – Specify the site server for integration with MDT.
     - **Site code** – Specify the code for the site for integration with MDT.



Specify the actions to perform.

● Install the MDT extensions for Configuration Manager

☑ Install the MDT console extensions for System Center 2012 R2 Configuration Manager

☑ Add the MDT task sequence actions to a System Center 2012 R2 Configuration Manager server

Site server name: SP3SCCM.contoso.com

Site code: 001

○ Remove the MDT extensions for Configuration Manager

□ Remove the MDT console extensions for System Center 2012 R2 Configuration Manager

□ Remove the MDT task sequence actions from a System Center 2012 R2 Configuration Manager server

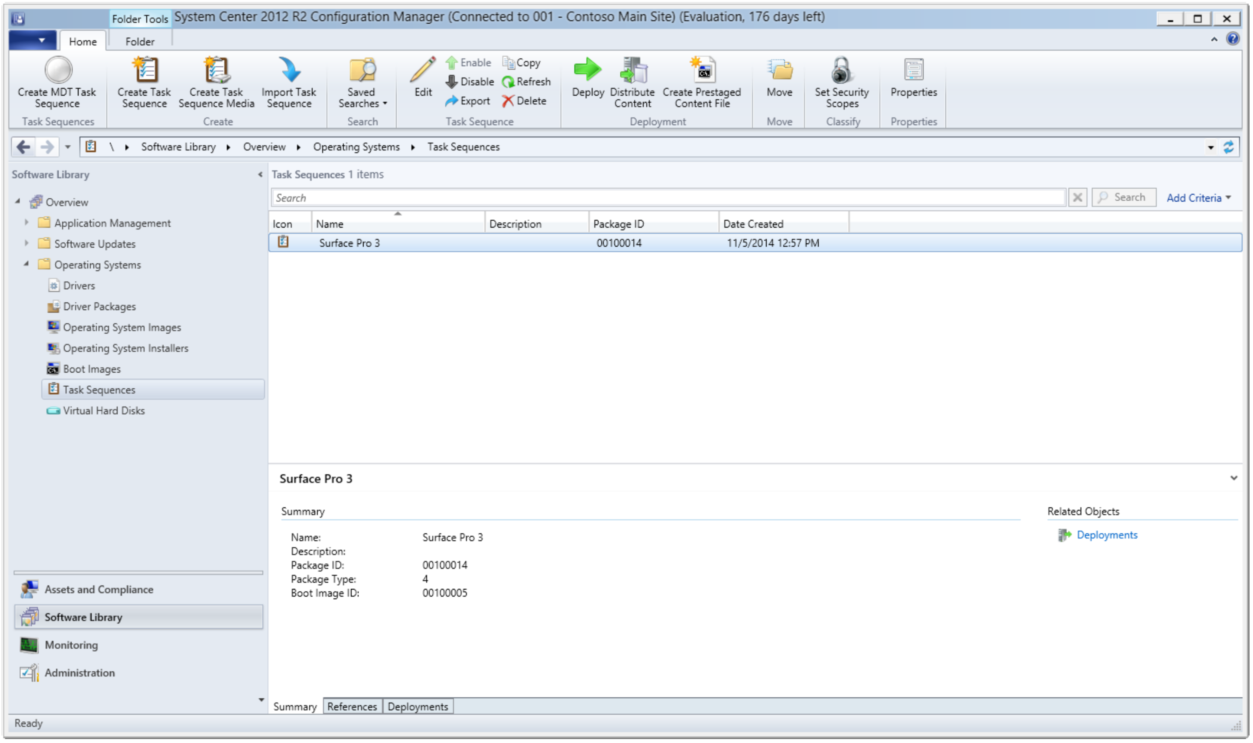
Site server name: SP3SCCM.contoso.com

Site code: 001

Figure 6.2: MDT ConfigMgr Integration Options.

   - **Confirmation** – Confirm the success of the operation and click **Finish**.

After the integration has been completed, in SCCM, locate the **Create MDT Task Sequence** button in the **Task Sequences** folder under **Operating Systems** in the **Software Library**, as shown in Figure 6.3. This button is used to create the deployment process in the Creating the Deployment Task Sequence section later in this Chapter.



Icon	Name	Description	Package ID	Date Created
	Surface Pro 3		00100014	11/5/2014 12:57 PM

Name: Surface Pro 3
Description:
Package ID: 00100014
Package Type: 4
Boot Image ID: 00100005

Figure 6.3: Create MDT Task Sequence Button.

Importing Surface Pro 3 Drivers

Similar to the way drivers were managed in MDT in the Importing Drivers section of Chapter 5, drivers for the boot media and the deployed operating system should also be kept separately in SCCM. The mechanism to organize drivers in SCCM is with packages and categories. Both are covered in this chapter.

The easiest way to keep the drivers separated is to import the drivers for the Surface Ethernet Adapter independently from the other drivers for the Surface Pro 3. Add the drivers imported each time to a Surface Pro 3 category, but only add the drivers for the Surface Ethernet Adapters to the boot media.

> **Note:** Because importing drivers is performed by folder, it is recommended to sort the folders downloaded with the Surface Pro 3 Firmware and Driver Pack into two categories, one for the Surface Ethernet Adapters and the other for everything else.

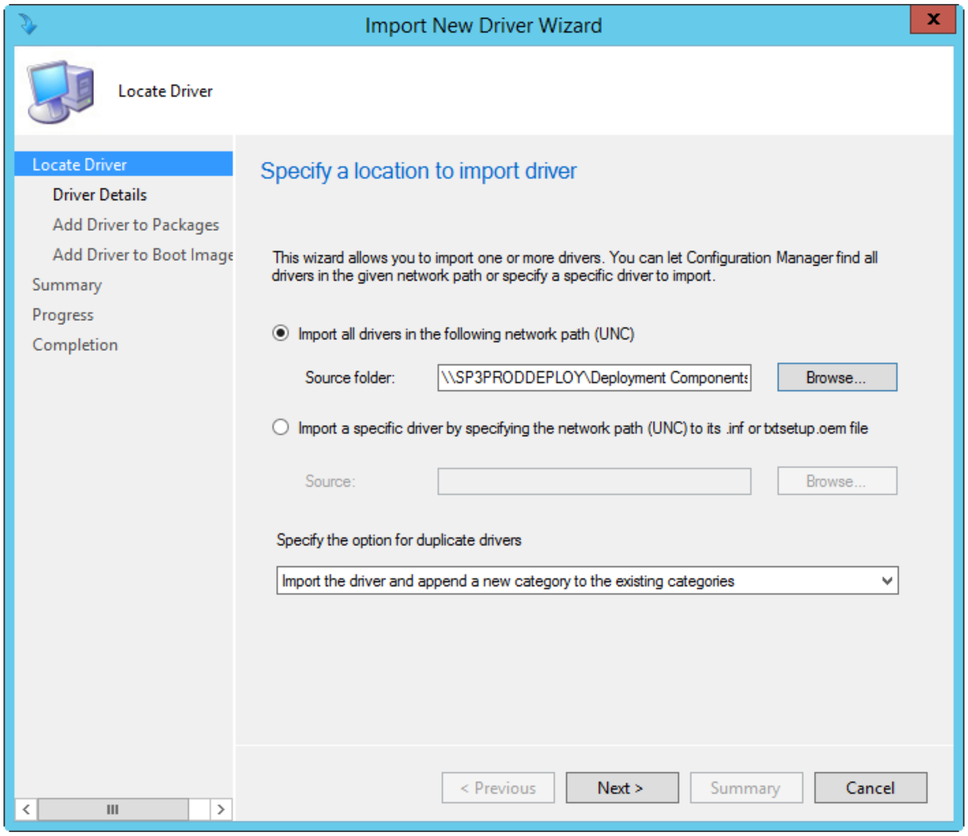
Importing the Drivers for the Boot Image

To import the Surface Ethernet Adapter drivers for boot media and for use in the deployed operating system, follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select the **Drivers** subfolder.

Note: Drivers can be organized into folders and subfolders within the **Drivers** folder for further organization.

3. Click the **Import Drivers** button in the **Home** ribbon to launch the **Import Drivers Wizard**.
4. The **Import Drivers Wizard** presents a series of steps:
   - **Locate Driver** – Provide the location of the driver files on this page through the following options, as shown in Figure 6.4, then click **Next**.
     - **Import all drivers in the following network path (UNC)** – Select this option. This will enable drivers for the Surface Ethernet Adapters to be imported at once.
       - **Source folder** – Specify the folder where you placed the drivers for the Surface Ethernet Adapters. All drivers in this folder will be imported, so you do not want to select a folder which contains other drivers.
     - **Import a specific driver by specifying the network path (UNC) to its .inf or txtsetup.oem file** – This option can be used to select only a single driver file, rather than a whole folder.
       - **Source** – When importing only a specific driver, this field is used to specify the location of that driver file.
     - **Specify the option for duplicate drivers** – Select **Import the driver and append a new category to the existing categories** from the drop down menu, this will overwrite an existing duplicate driver and replace that existing duplicate driver in any categories specified. Other options from this menu include the ability to import the driver without modifying the categories, import the driver and creating new categories that overwrite the existing categories, or to not import the drivers if a duplicate is found.



Specify a location to import driver

This wizard allows you to import one or more drivers. You can let Configuration Manager find all drivers in the given network path or specify a specific driver to import.

● Import all drivers in the following network path (UNC)

Source folder: \\SP3PRODDEPLOY\Deployment Components

○ Import a specific driver by specifying the network path (UNC) to its .inf or txtsetup.oem file

Source:

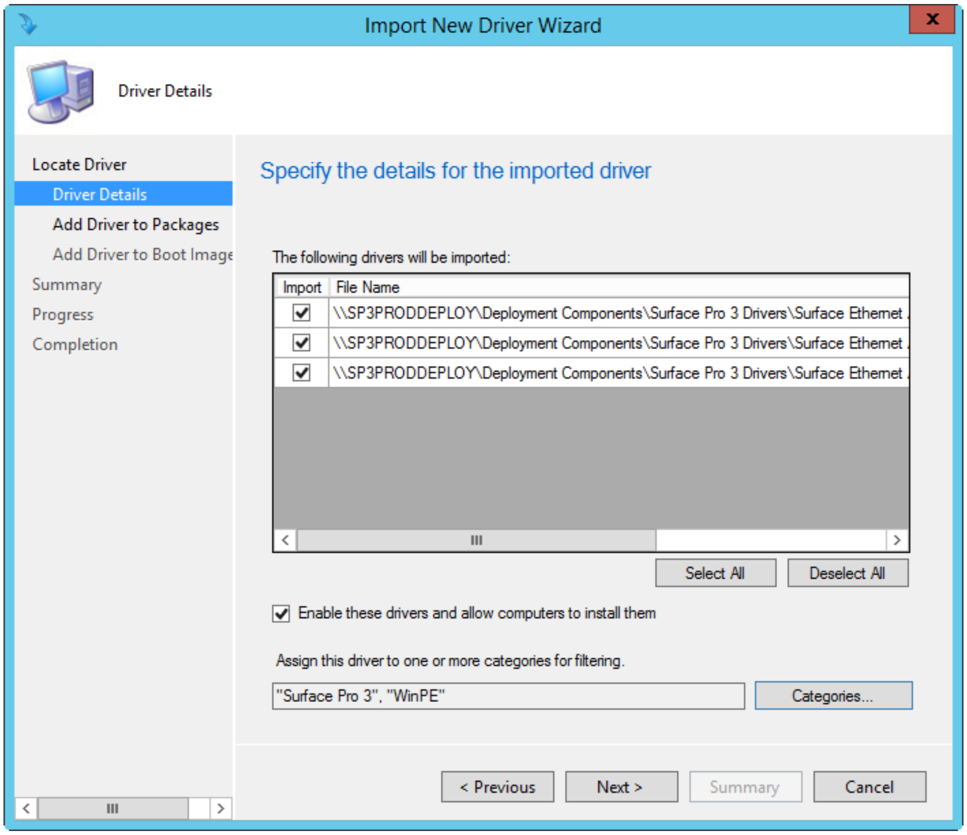
Specify the option for duplicate drivers

Import the driver and append a new category to the existing categories

Figure 6.4: Driver Location in Import Drivers Wizard.

Note: The location of the drivers to be imported must be a network share (UNC).

- **Driver details** – A list of the drivers found will appear on this page, specify the following options as shown in Figure 6.5, and then click **Next**.
  - **The following drivers will be imported** – All drivers found should be selected if you imported all drivers from the Surface Ethernet Adapters folder.
  - **Enable these drivers and allow computers to install them** – Ensure that this option is selected to allow these drivers to be used.
  - **Assign this driver to one or more categories for filtering** – Select the **Categories** button to launch the Manage Administrative Categories dialog**.**
    - Click **Create** to create a new administrative category.
    - Provide the name **Surface Pro 3** in the **Specify the name of the new administrative category** field of the **Create Administrative Category** dialog box, then click **OK**.



Specify the details for the imported driver

The following drivers will be imported:

Import	File Name
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Ethernet
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Ethernet
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Ethernet

☑ Enable these drivers and allow computers to install them

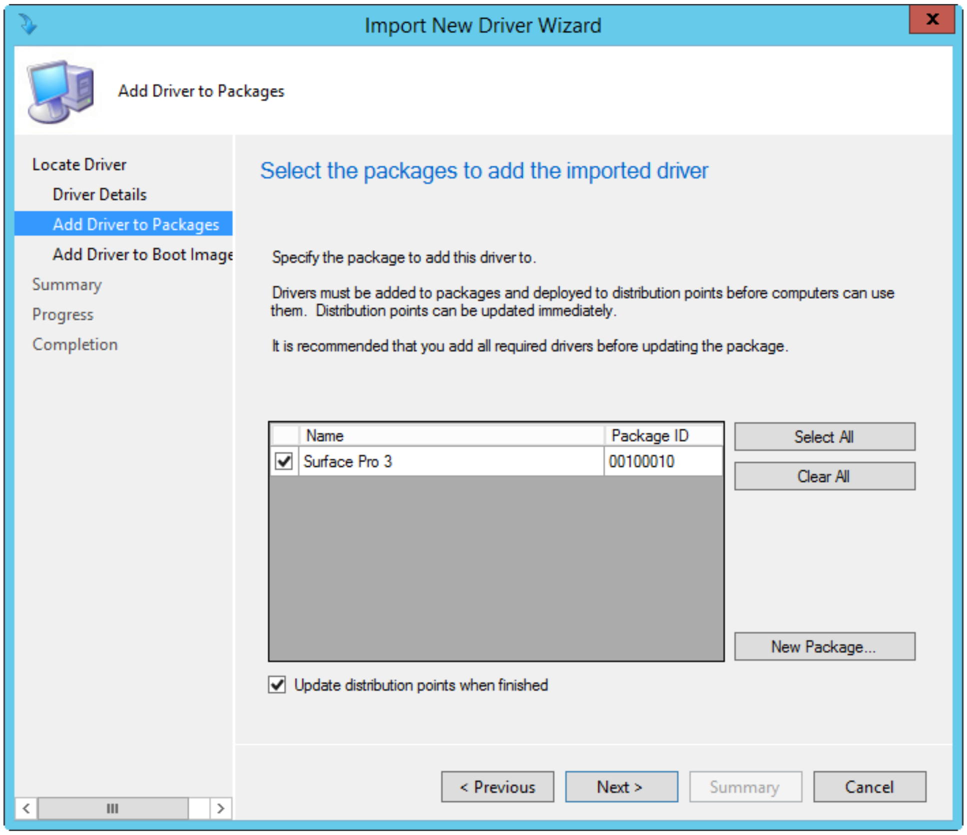
Assign this driver to one or more categories for filtering.

"Surface Pro 3", "WinPE"

Figure 6.5: Driver Details in Import Drivers Wizard.

- **Add Driver to Packages** – Create a new package for Surface Pro 3 devices by following steps shown in Figure 6.6, then click **Next**.
  - Click **New Package** to create a new package.
  - Complete the **Create Driver Package** dialog with following options, then click **OK**.

- **Name** – Name the package **Surface Pro 3**.
- **Comment** – Supply any desired comment.
- **Path** – Enter the network path where these drivers will be stored. If no path already exists where you want to store these drivers, create one on the SCCM server.



Import New Driver Wizard

Add Driver to Packages

Select the packages to add the imported driver

Specify the package to add this driver to.

Drivers must be added to packages and deployed to distribution points before computers can use them. Distribution points can be updated immediately.

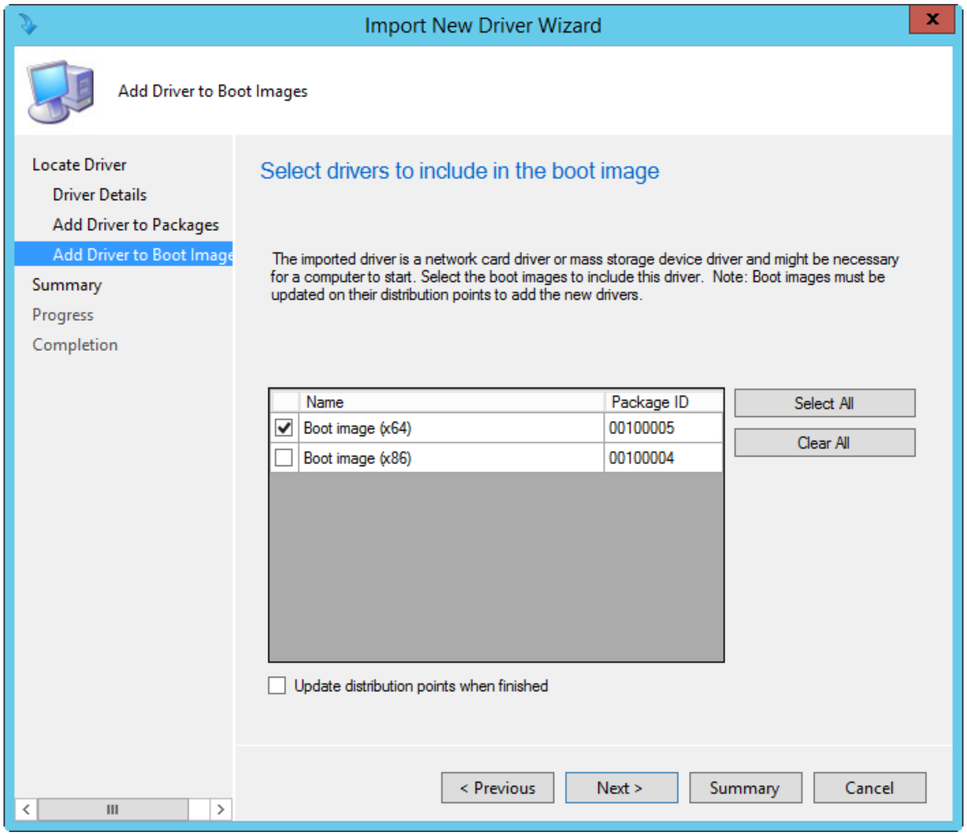
It is recommended that you add all required drivers before updating the package.

	Name	Package ID
☑	Surface Pro 3	00100010

☑ Update distribution points when finished

Figure 6.6: Specifying Driver Packages in the Import Drivers Wizard.

- **Add Driver to Boot Image** – Select the x64 boot image to add the Surface Ethernet Adapter drivers to that image, as shown in Figure 6.7, then click **Next**.



Select drivers to include in the boot image

The imported driver is a network card driver or mass storage device driver and might be necessary for a computer to start. Select the boot images to include this driver. Note: Boot images must be updated on their distribution points to add the new drivers.

	Name	Package ID
☑	Boot image (x64)	00100005
□	Boot image (x86)	00100004

□ Update distribution points when finished

Figure 6.7: Specifying Boot Image in Import Drivers Wizard.

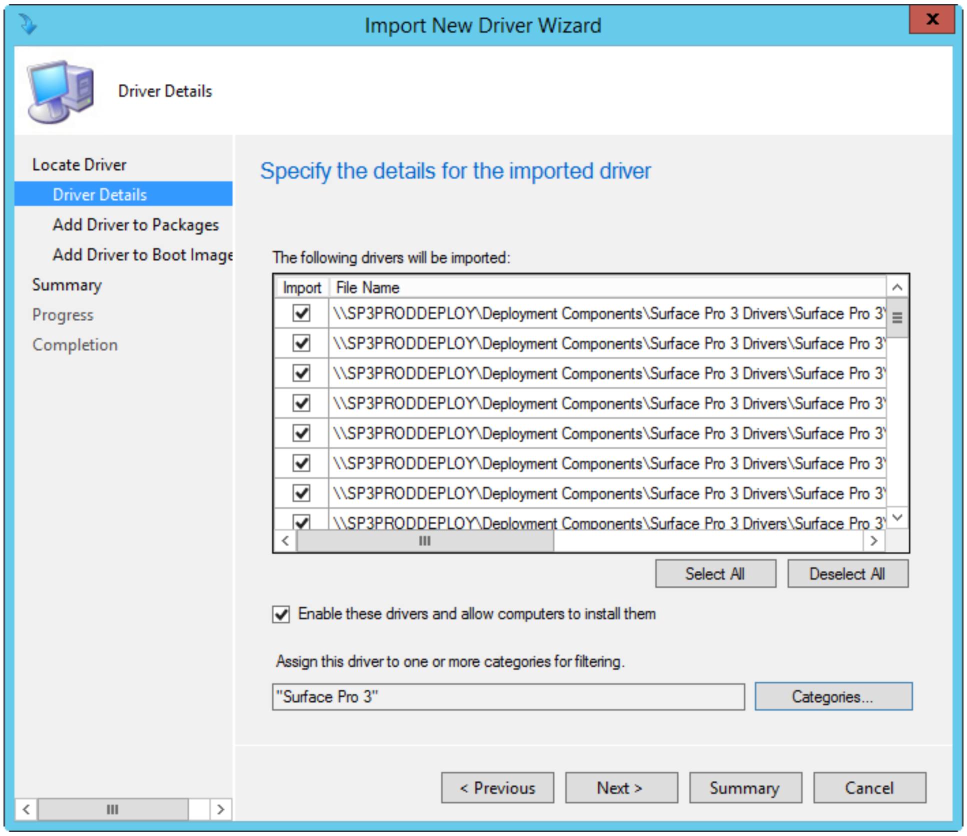
- **Summary** – Confirm the selected options and then click **Next.**
- **Progress** – A progress bar is displayed during the driver import process.
- **Completion** – Confirmation of successful import is shown, click **Close** to complete the **Import New Driver Wizard**.

Importing the Drivers for Windows 8.1

To import the drivers for the operating system follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select the **Drivers** subfolder.
3. Click the **Import Drivers** button in the **Home** ribbon to launch the **Import Drivers Wizard**.
4. The Import Drivers Wizard presents a series of steps:
   - **Locate Driver** – Provide the location of the driver files on this page through the following options, then click **Next**.
     - **Import all drivers in the following network path (UNC)** – Select this option. This enables all the drivers for the Surface Ethernet Adapters to be imported at once.
       - **Source folder** – Specify the folder where you placed the drivers from the Surface Pro 3 Firmware and Drivers Pack.
     - **Specify the option for duplicate drivers** – Select **Import the driver and append a new category to the existing categories** from the drop down menu.

- **Driver details** – A list of all of the drivers found will appear on this page, specify the following options as shown in Figure 6.8, and then click **Next**.
  - **The following drivers will be imported** – All drivers found should be selected if you imported all drivers from the Surface Ethernet Adapters folder.
  - **Enable these drivers and allow computers to install them** – Ensure that this option is selected to allow these drivers to be used.
  - **Assign this driver to one or more categories for filtering** – Select the **Categories** button to launch the Manage Administrative Categories dialog**.**
    - Select the **Surface Pro 3** category that was created when importing the boot image drivers.



Specify the details for the imported driver

The following drivers will be imported:

Import	File Name
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\
☑	\\SP3PRODDEPLOY\Deployment Components\Surface Pro 3 Drivers\Surface Pro 3\

☑ Enable these drivers and allow computers to install them

Assign this driver to one or more categories for filtering.

"Surface Pro 3"

Figure 6.8: Surface Pro 3 Driver Details.

- **Add Driver to Packages** – Select the **Surface Pro 3** package created when importing the boot image drivers, then click **Next**.
- **Add Driver to Boot Image** – Do not select a boot image for these drivers, then click **Next**.
- **Summary** – Confirm the selected options and then click **Next.**
- **Progress** – A progress bar is displayed during the driver import process.
- **Completion** – Confirmation of successful import is shown, click **Close** to complete the **Import New Driver Wizard**.

You have now imported the drivers and firmware for Surface Pro 3 devices into SCCM and the Surface Ethernet Adapter drivers are included in the boot images so as to provide network connectivity in WinPE. The Surface Pro 3 Firmware and

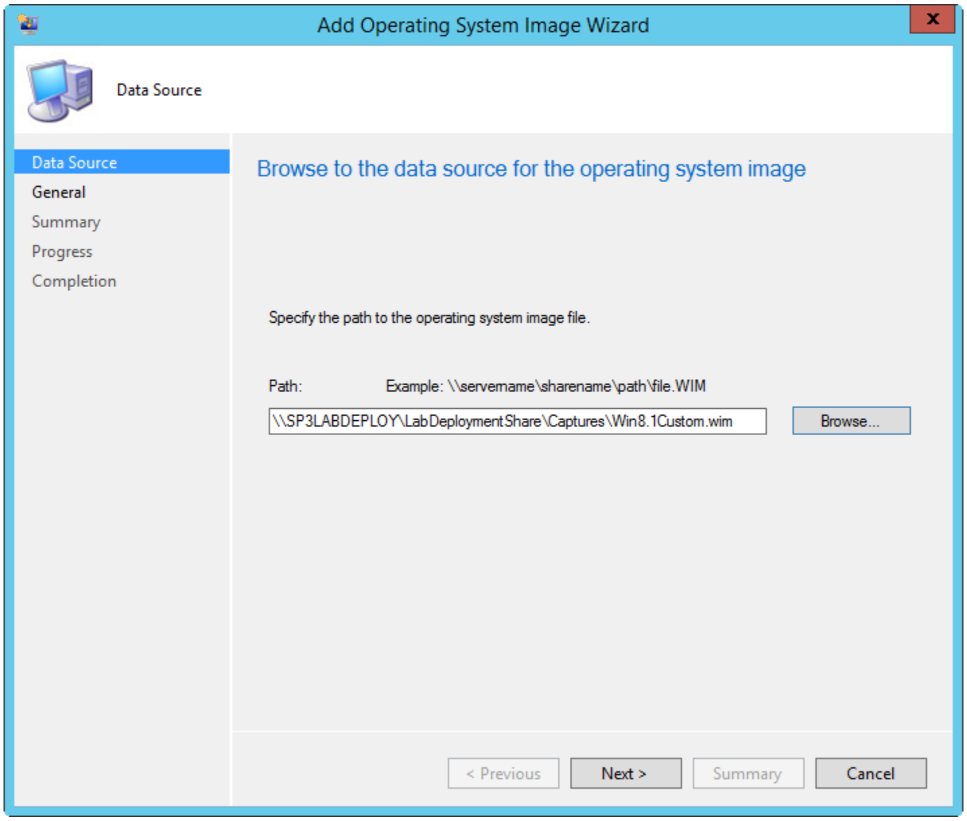
Driver Pack and Surface Ethernet Adapter drivers are now included in a package that can be deployed to managed Surface Pro 3 devices to update the drivers and are included in a category that can be specified during deployment.

Importing the Operating System Image

As described in the introduction to this chapter, even when SCCM is used as the deployment solution for production systems, it is still recommended to capture images through MDT. In Chapter 4, an image was produced in a separate lab deployment environment for use in production. This image resides in the lab deployment share and must be imported into SCCM for use in deployment.

To import the operating system image, follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select the **Operating System Images** subfolder.
3. Click the **Add Operating System Image** button from the **Home** ribbon to launch the **Add Operating System Image Wizard**, which presents a series of steps:
    - **Data Source** – Specify the WIM file that was created during the Creating an Image from the Reference System section of Chapter 4, as shown in Figure 6.9. This image should be located in the lab deployment share in the **Captures** folder. Click **Next**.



Browse to the data source for the operating system image

Specify the path to the operating system image file.

Path: Example: \\servername\sharename\path\file.WIM

\\SP3LABDEPLOY\LabDeploymentShare\Captures\Win8.1Custom.wim

Figure 6.9: Lab Deployment Share Image File.

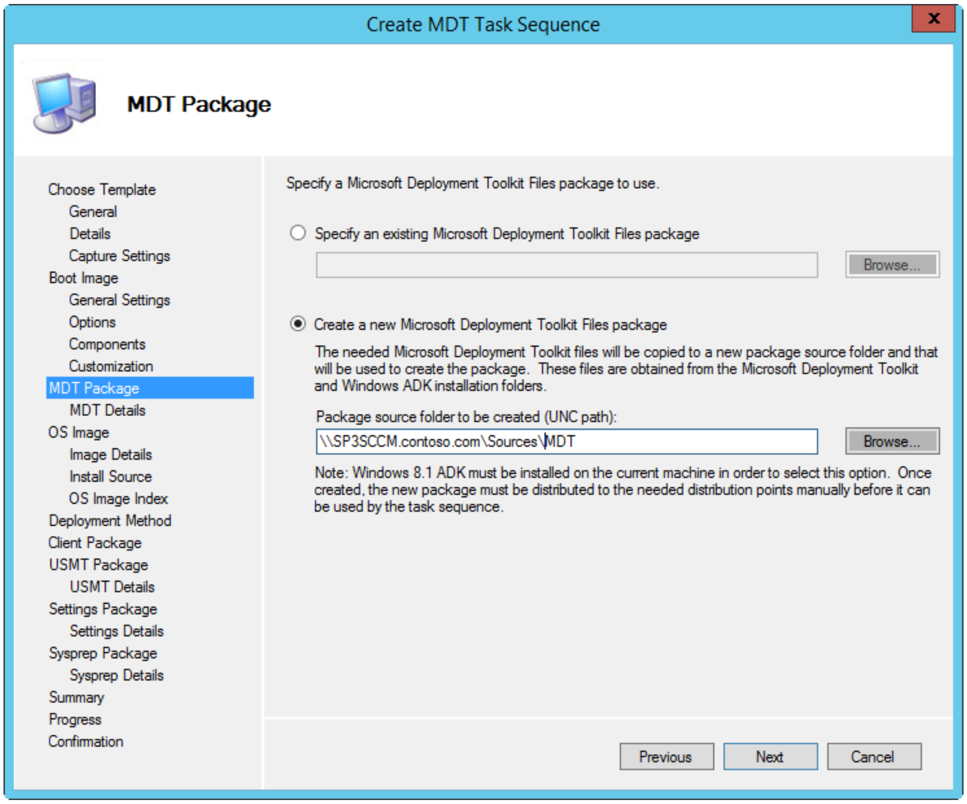
- **General** – Specify a name and if desired, version and comment, then click **Next**.
- **Summary** – Confirm the selected options and then click **Next.**
- **Progress** – A progress bar is displayed during the image import process.

- **Completion** – Confirmation of successful import is shown, click **Close** to complete the **Add Operating System Image Wizard**.

Creating the Deployment Task Sequence

Now that the components are available for deployment, the next step is to create the sequence of steps that will be performed during the deployment process. This is where the integration with MDT comes into play. To create the deployment task sequence, follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select **Task Sequences**.
3. Click the **Create MDT Task Sequence** button in the **Home** ribbon to launch the **Create MDT Task Sequence** dialog.
4. The **Create MDT Task Sequence** dialog presents a number of steps:
    - **Choose Template** – Select the **Client Task Sequence** template and click **Next**.
    - **General** – Specify a name and any desired comments and click **Next**.
    - **Details** – Specify domain or workgroup join and registration details in the following sections and click **Next**.
        - **Join a Workgroup or Domain** – Select the Join a domain option and specify the domain name and credentials with authority to join that domain.
        - **Windows Settings** – Provide the user and organization name for registration and a product key, if required.
    - **Capture Settings** – Select the **This task sequence will never be used to capture an image** option and click **Next**.
    - **Boot Image** – Select the **Specify an existing boot image package** option, then click **Browse** and select the x64 boot image. Click **Next**.
    - **MDT Package** – Select the **Create a new Microsoft Deployment Toolkit Files package** option and then browse to a network share that will be used to hold the MDT files for this deployment as shown in Figure 6.10. If no existing network location exists, one will need to be created. The network share or subfolder must be empty. Click **Next**.



Specify a Microsoft Deployment Toolkit Files package to use.

○ Specify an existing Microsoft Deployment Toolkit Files package

● Create a new Microsoft Deployment Toolkit Files package

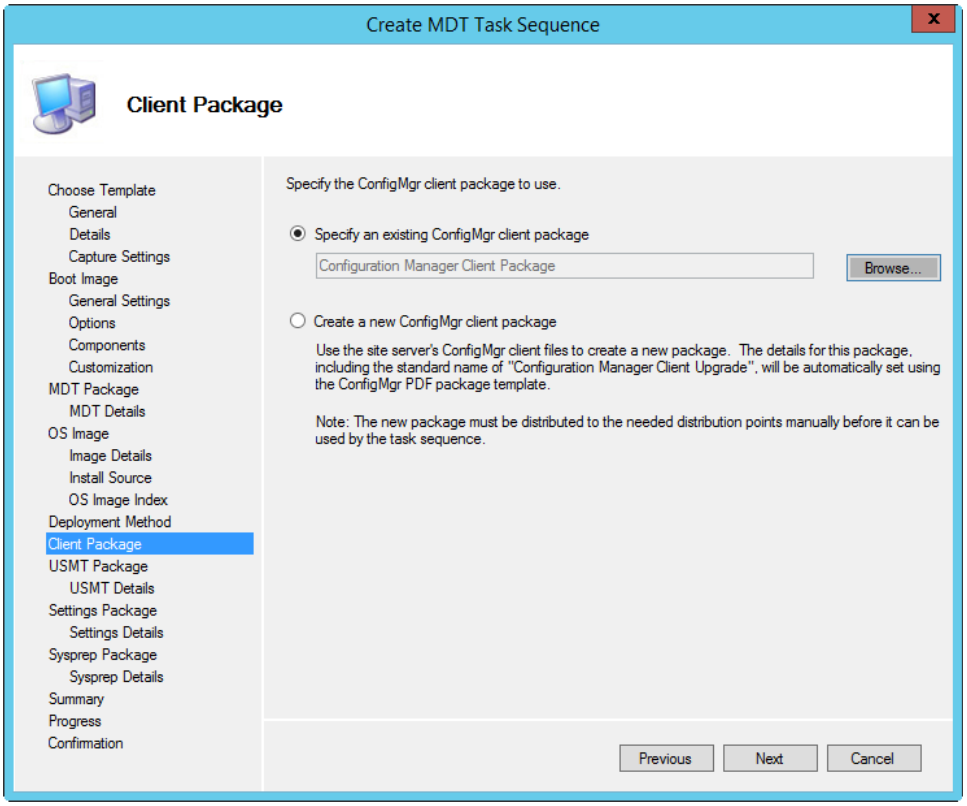
The needed Microsoft Deployment Toolkit files will be copied to a new package source folder and that will be used to create the package. These files are obtained from the Microsoft Deployment Toolkit and Windows ADK installation folders.

Package source folder to be created (UNC path): \\SP3SCCM.contoso.com\Sources\MDT

Note: Windows 8.1 ADK must be installed on the current machine in order to select this option. Once created, the new package must be distributed to the needed distribution points manually before it can be used by the task sequence.

Figure 6.10: MDT Package Creation.

- **MDT Details** – Provide a name and if desired, version, language, manufacturer, and comments for the MDT files that will be created. Click **Next**.
- **OS Image** – Select the **Specify an existing OS image** option, then click **Browse** and select the image that was imported from the lab deployment server. Click **Next**.
- **Deployment Method** – Select the **Perform a “Zero Touch Installation” OS deployment, with no user interaction** option and click **Next**.
- **Client Package** – Select the **Specify an existing ConfigMgr client package** option, then click **Browse** and select the SCCM client package that is also used to deploy the SCCM client to managed devices in your organization, as shown in Figure 6.11. Click **Next**.



Specify the ConfigMgr client package to use.

● Specify an existing ConfigMgr client package

Configuration Manager Client Package

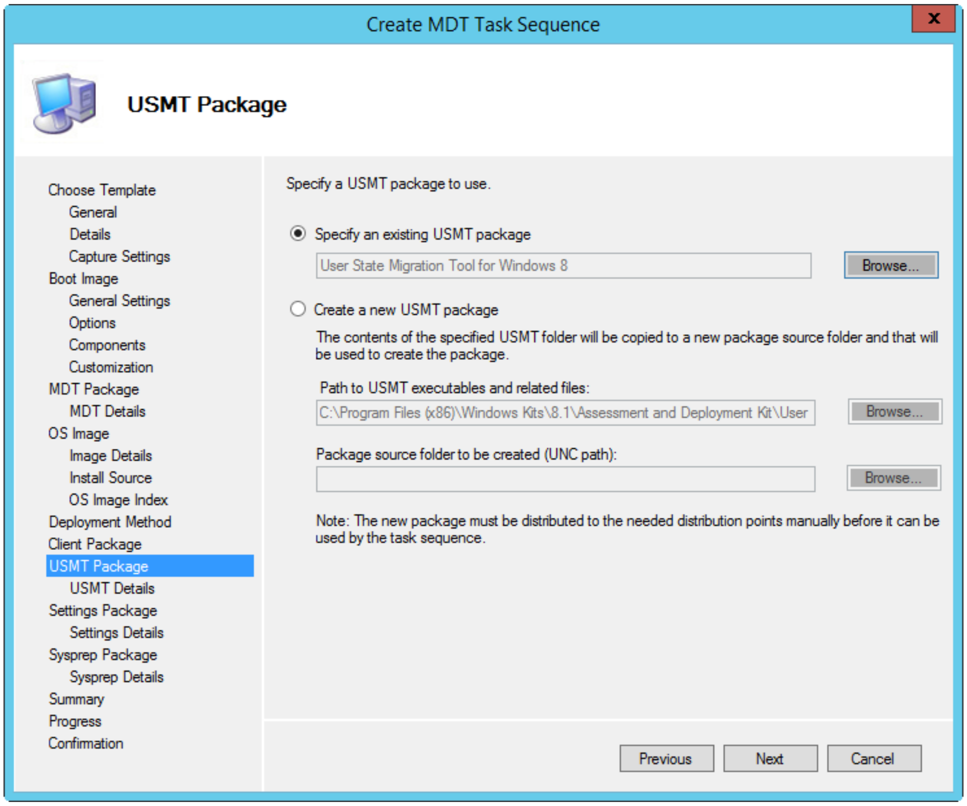
○ Create a new ConfigMgr client package

Use the site server's ConfigMgr client files to create a new package. The details for this package, including the standard name of "Configuration Manager Client Upgrade", will be automatically set using the ConfigMgr PDF package template.

Note: The new package must be distributed to the needed distribution points manually before it can be used by the task sequence.

Figure 6.11: ConfigMgr Client Package.

- **USMT Package** – Select the **Specify an existing USMT package** option, then click **Browse** and select the USMT package used in your organization as shown in Figure 6.12. Click **Next**.



Create MDT Task Sequence

USMT Package

Specify a USMT package to use.

● Specify an existing USMT package

User State Migration Tool for Windows 8 [Browse...]

○ Create a new USMT package

The contents of the specified USMT folder will be copied to a new package source folder and that will be used to create the package.

Path to USMT executables and related files:

C:\Program Files (x86)\Windows Kits\8.1\Assessment and Deployment Kit\User [Browse...]

Package source folder to be created (UNC path):

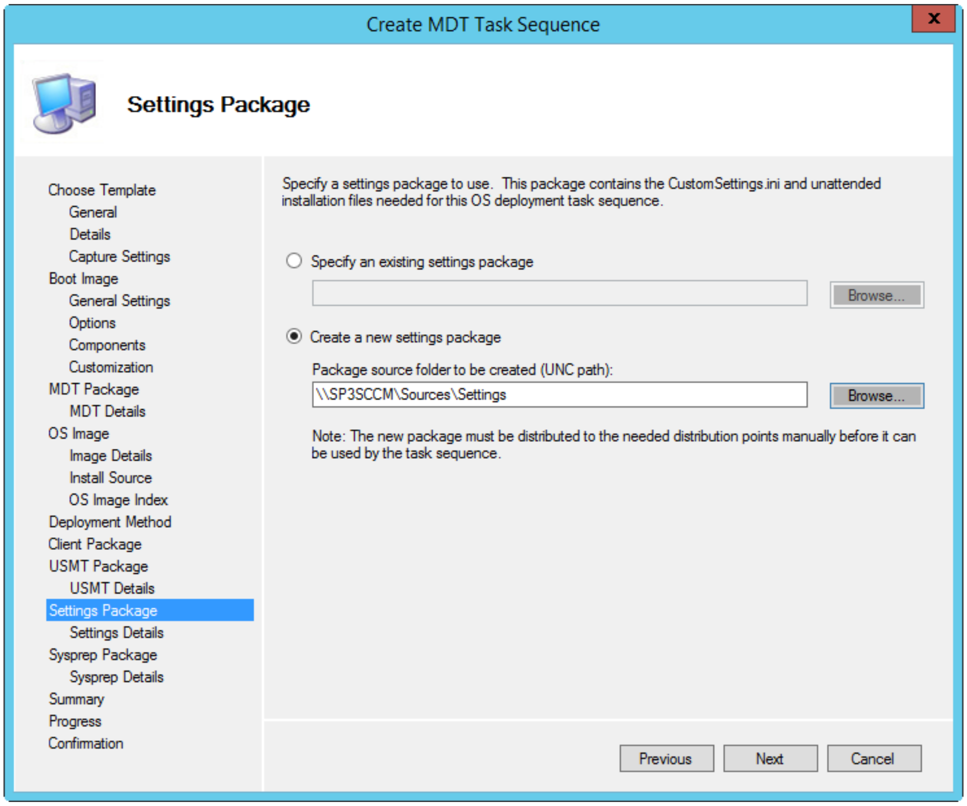
[Browse...]

Note: The new package must be distributed to the needed distribution points manually before it can be used by the task sequence.

Figure 6.12: USMT Client Package.

For more information about USMT, see the Deployment Tools section of Chapter 2 and the Migrating User Data section of Chapter 8.

- **Settings Package** – Select the **Create a new settings package** option and then click **Browse** and select the network share path for the settings package, as shown in Figure 6.13. If one does not exist, it will need to be created. Click **Next**.



Settings Package

Specify a settings package to use. This package contains the CustomSettings.ini and unattended installation files needed for this OS deployment task sequence.

○ Specify an existing settings package

● Create a new settings package

Package source folder to be created (UNC path): \\SP3SCCM\Sources\Settings

Note: The new package must be distributed to the needed distribution points manually before it can be used by the task sequence.

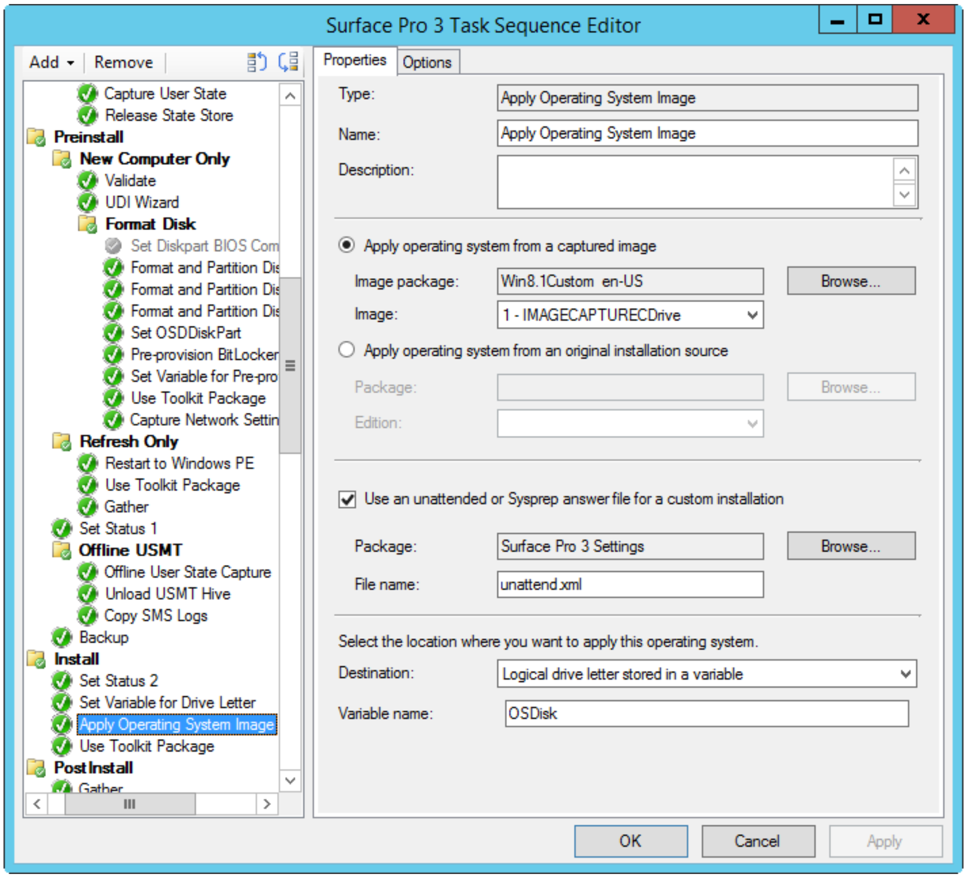
Figure 6.13: Settings Package.

- **Settings Details** – Provide a name and if desired, version, language, manufacturer, and comments for the settings package that will be created. Ensure the **This settings package is for a Server Core operating system installation** check box is unselected. Click **Next**.
- **Sysprep Package** – Select **No Sysprep package is required** and click **Next**.
- **Summary** – Confirm the selected options and click **Next**.
- **Progress** – A progress bar is shown while the task sequence is created.
- **Confirmation** – The successful creation of the task sequence is displayed, click **Finish** to close the **Create MDT Task Sequence** dialog.

Specifying Drivers to Use in the Deployment Task Sequence

The deployment task sequence created through the **Create MDT Task Sequence** dialog box is automatically configured to deploy the best available drivers from all driver categories. To apply only the Surface Pro 3 drivers during deployment, the **Auto Apply Drivers** step must be modified. To modify the **Auto Apply Drivers** step, follow this process:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select **Task Sequences**.
3. Select the deployment task sequence and click **Edit** from the **Home** ribbon to open the **Task Sequence Editor**.
4. The **Task Sequence Editor** will open and display the list of steps used to perform deployment.
5. Select the **Auto Apply Drivers** step from the **Post Install** folder as shown in Figure 6.14.



Surface Pro 3 Task Sequence Editor

Type: Apply Operating System Image

Name: Apply Operating System Image

Description:

● Apply operating system from a captured image

Image package: Win8.1Custom en-US

Image: 1 - IMAGECAPTUREDrive

○ Apply operating system from an original installation source

Package:

Edition:

☑ Use an unattended or Sysprep answer file for a custom installation

Package: Surface Pro 3 Settings

File name: unattend.xml

Select the location where you want to apply this operating system.

Destination: Logical drive letter stored in a variable

Variable name: OSDisk

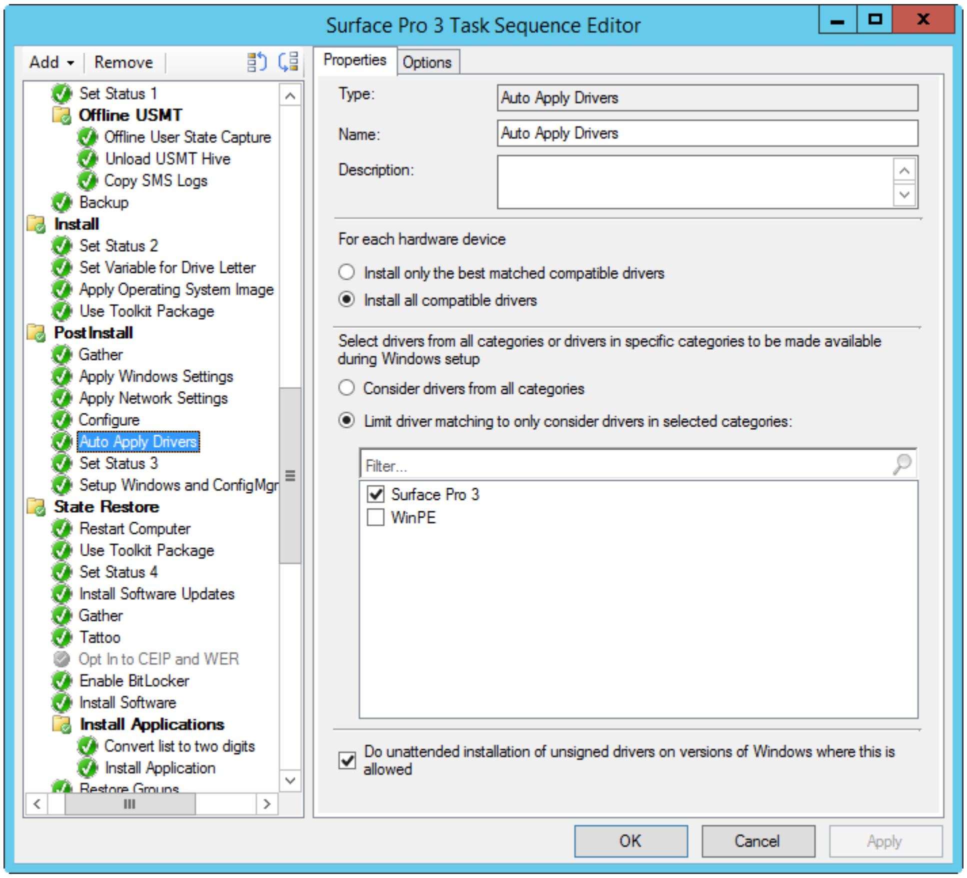
Figure 6.14: Auto Apply Drivers Step.

6. In the **For each hardware device** section of the **Properties** tab, select the **Install all compatible drivers** option.
7. In the **Select drivers from all categories or drivers in specific categories to be made available during Windows setup section**, select the **Limit driver matching to only consider drivers in selected categories** option and then select the **Surface Pro 3** category.
8. Close the **Task Sequence Editor**.

Specifying the CopyProfile setting in the Answer Profile

To ensure that the settings that were configured for the **Administrator** profile in the Customizations to the Reference Image section of Chapter 4 will be copied to the **Default** profile, the **CopyProfile** setting must be specified in the answer file used with the deployment task sequence. To specify an answer file to use in the deployment task sequence, follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select **Task Sequences**.
3. Select the deployment task sequence and click **Edit** from the **Home** ribbon to open the **Task Sequence Editor**.
4. Select the **Apply Operating System Image** step from the **Install** folder as shown in Figure 6.15.



Type: Auto Apply Drivers

Name: Auto Apply Drivers

Description:

For each hardware device

○ Install only the best matched compatible drivers

● Install all compatible drivers

Select drivers from all categories or drivers in specific categories to be made available during Windows setup

○ Consider drivers from all categories

● Limit driver matching to only consider drivers in selected categories:

Filter...

☑ Surface Pro 3

☐ WinPE

☑ Do unattended installation of unsigned drivers on versions of Windows where this is allowed

Figure 6.15: Apply Operating System Image Step.

5. Check the **Use an unattended or Sysprep answer file for a custom installation** check box from the **Properties** tab for the step.
6. The **Package** field displays the Settings package that was specified during creation of the task sequence.
7. The **File name** field displays the name of the answer file that will be used. A file matching this name placed in the settings package location will be used during deployment.
8. Close the **Task Sequence Editor**.

To modify the answer file used for deployment, follow these steps:

1. Launch **Windows System Image Manager** from the Start Screen, under **Windows Kits**.
2. Open the **File** menu and click **Open Answer File**.
3. Open the **Unattend.xml** answer file located in the storage location specified for the settings package during creation of the task sequence.
4. Open the **File** menu and click **Select Windows Image**.
5. Select the image file that you imported from the lab deployment server. If a catalog has not yet been generated for this image, it will be generated when the image is selected.
6. Modify the **CopyProfile** setting using the steps outlined in the Creating the Test Deployment Task Sequence section in Chapter 4.
7. Save the answer file and close **Windows System Image Manager**.

Deploying the Operating System Task Sequence to the Client

This section outlines how to make the component packages available on the SCCM distribution point. It also shows how to deploy to existing Surface Pro 3 SCCM clients and to new Surface Pro 3 devices.

Updating Distribution Point Components

Before the deployment can be run on client systems, the components that were prepared through the process in this chapter must be updated for the distribution point. If the distribution point is not updated with these components, the deployment will look for resources that are not available.

To update the distribution point, follow these steps:

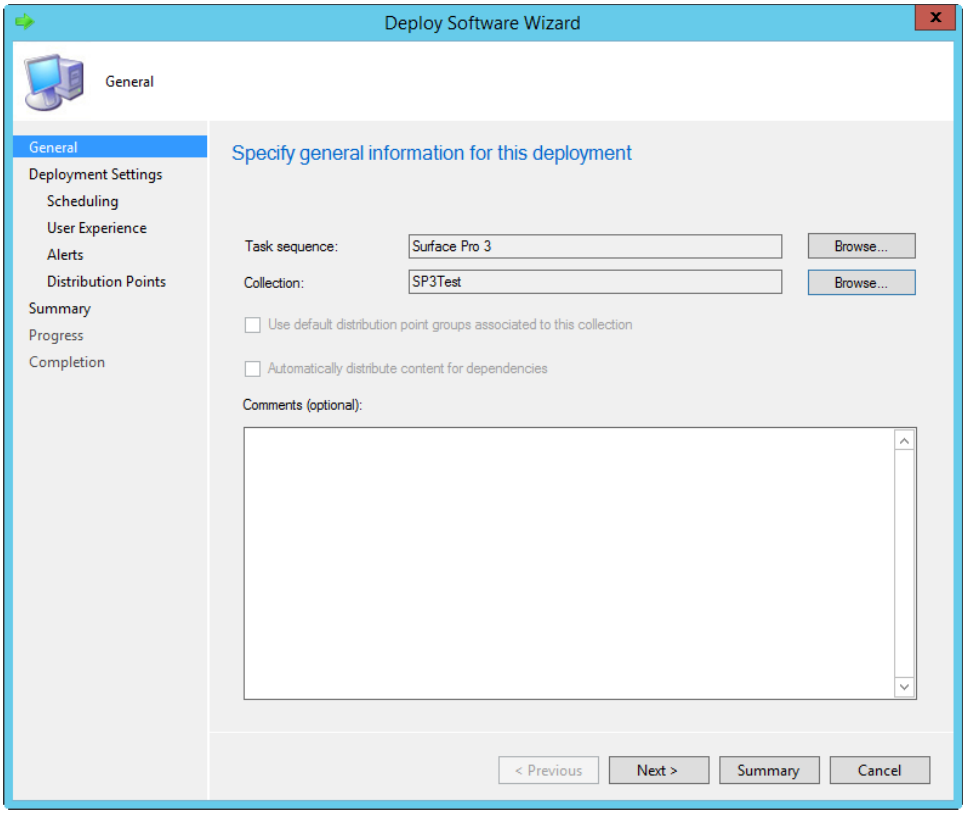
1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select **Task Sequences**.
3. Select the deployment task sequence.
4. Select **Distribute Content** from the **Home** ribbon to open the **Distribute Content Wizard**.
5. The **Distribute Content Wizard** presents as series of steps:
   - **General** – The content field will show the deployment task sequence, click **Next**.
   - **Content** – Dependencies for the deployment task sequence will appear, including the selected image and packages. Click **Next**.
   - **Content Destination** – The distribution point where the content will be made available must be specified on this page with this procedure:
     - Click the **Add** drop down menu and then select **Distribution Point**.
     - Select the desired distribution point from the list and click **OK**.
   - **Summary** – The selected options will appear, click **Next**.
   - **Progress** – A progress bar is displayed during the content distribution process.
   - **Completion** – Success will be reported, click **Close**.

Deploying to Existing SCCM Clients

Note: Before deployment is run, it is a good idea to ensure that your Surface Pro 3 devices are configured in a collection. A *collection* is a method of organizing devices. Task sequence deployment is performed by collection.

Now that the content is available, the deployment can be initiated from SCCM to a managed client. To run the deployment task sequence on a target managed system, follow these steps:

1. In SCCM, open the **Software Library**.
2. Expand the **Operating Systems** folder and select **Task Sequences**.
3. Select the deployment task sequence.
4. Select **Deploy** from the **Home** ribbon to open the **Deploy Software Wizard**.
5. The **Deploy Software Wizard** presents a series of steps:
   - **General** – The task sequence will appear in the **Task sequence** field, click **Browse** next to the **Collection** field to specify the collection where the task sequence will be run as shown in Figure 6.16. Click **Next**.



Specify general information for this deployment

Task sequence: Surface Pro 3

Collection: SP3Test

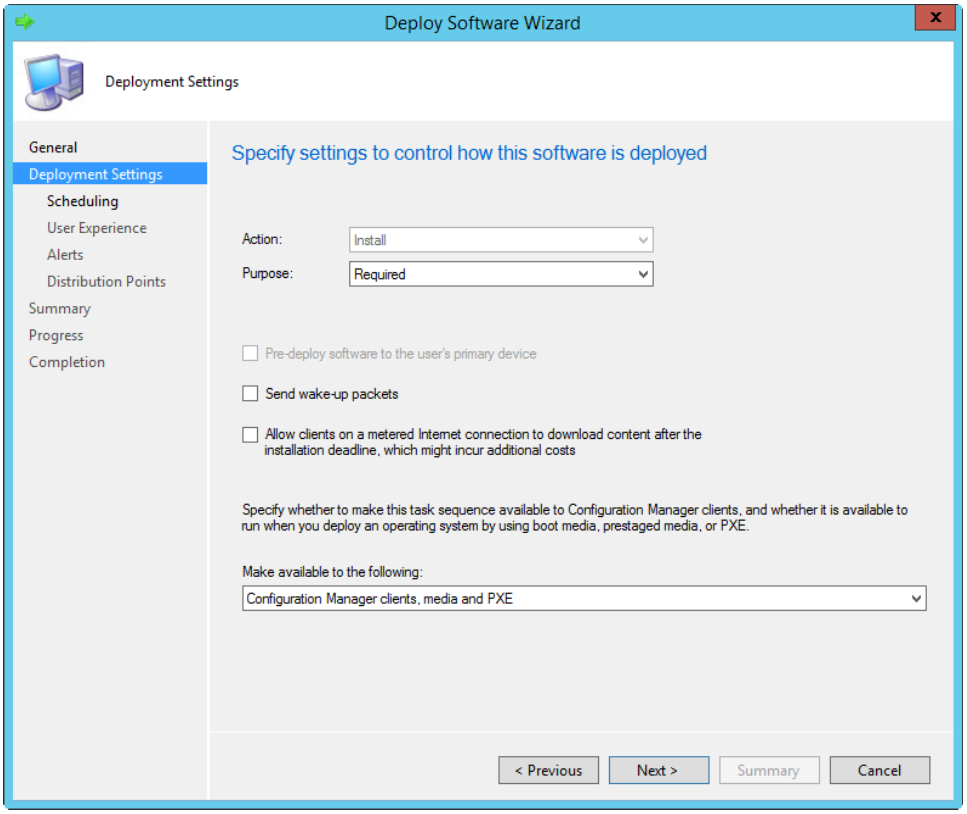
□ Use default distribution point groups associated to this collection

□ Automatically distribute content for dependencies

Comments (optional):

Figure 6.16: Deploy Software Wizard Task Sequence and Collection.

- **Deployment Settings** – Define if the deployment will be available or mandatory and if the deployment will be available to existing SCCM clients or via PXE or media through the following options, as shown in Figure 6.17. Click **Next**.
  - **Purpose** – This can be set to **Available** to make the task sequence available in the **Software Center** on the clients or set to **Required** to enforce deployment of the operating system to the clients. For testing the deployment to an existing client, set this to **Required** to initiate the process from the server.
  - **Send wake-up packets** – For clients with wake-on-lan support, this check box can be checked to wake the clients up and perform the deployment.
  - **Allow clients on a metered Internet connection to download content after the installation deadline, which might incur additional costs** – Use this setting to force the download of the task sequence, even over a metered connection.
  - **Make available to the following** – Use this setting to determine if the task sequence will be available only to existing SCCM clients or through PXE or media.



Specify settings to control how this software is deployed

Action: Install

Purpose: Required

□ Pre-deploy software to the user's primary device

□ Send wake-up packets

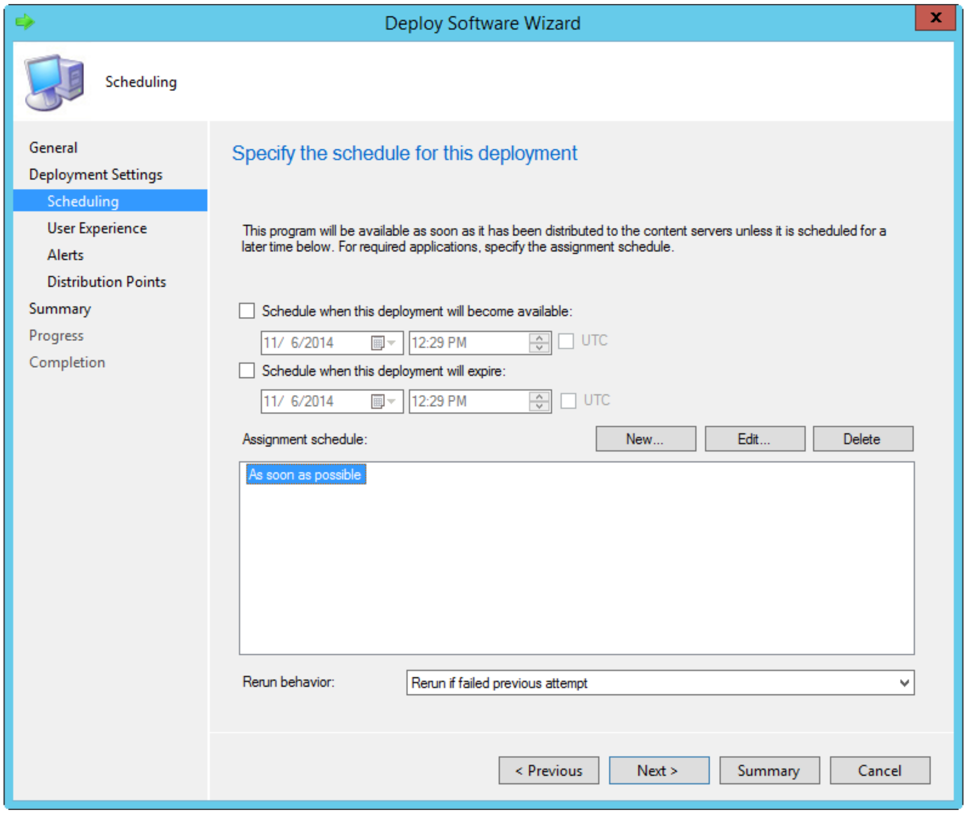
□ Allow clients on a metered Internet connection to download content after the installation deadline, which might incur additional costs

Specify whether to make this task sequence available to Configuration Manager clients, and whether it is available to run when you deploy an operating system by using boot media, prestaged media, or PXE.

Make available to the following: Configuration Manager clients, media and PXE

Figure 6.17: Deployment Settings.

- **Scheduling** – You can set when the task sequence will be made available, when the deployment should complete by, and for **Required** applications you can define a schedule or make the task sequence immediately available. For testing, click the **New** button to create an assignment schedule, then set **Assign immediately after this event** to **As soon as possible** as shown in Figure 6.18. Click **Next**.



Specify the schedule for this deployment

This program will be available as soon as it has been distributed to the content servers unless it is scheduled for a later time below. For required applications, specify the assignment schedule.

□ Schedule when this deployment will become available:

11/ 6/2014 12:29 PM □ UTC

□ Schedule when this deployment will expire:

11/ 6/2014 12:29 PM □ UTC

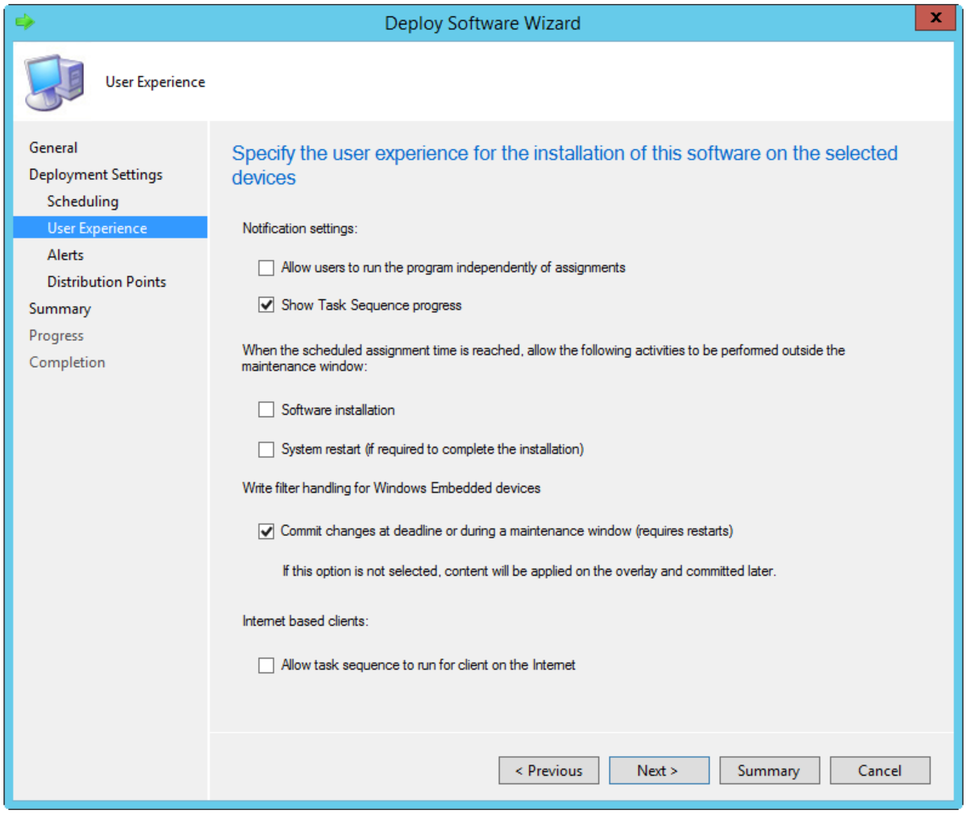
Assignment schedule:

As soon as possible

Rerun behavior: Rerun if failed previous attempt

Figure 6.18: Deployment Schedule.

- **User Experience** – You can configure a number of options as shown in Figure 6.19 for the task sequence on this page, select the **Notification Settings** options as follows and then click **Next**:
    - **Notification Settings** – Specify whether users should be able to run the task sequence outside of the configured rules and whether Task Sequence progress will be displayed. For testing, the task sequence progress should be displayed to provide visual confirmation of the task being run.



Specify the user experience for the installation of this software on the selected devices

Notification settings:

☐ Allow users to run the program independently of assignments

☑ Show Task Sequence progress

When the scheduled assignment time is reached, allow the following activities to be performed outside the maintenance window:

☐ Software installation

☐ System restart (if required to complete the installation)

Write filter handling for Windows Embedded devices

☑ Commit changes at deadline or during a maintenance window (requires restarts)

If this option is not selected, content will be applied on the overlay and committed later.

Internet based clients:

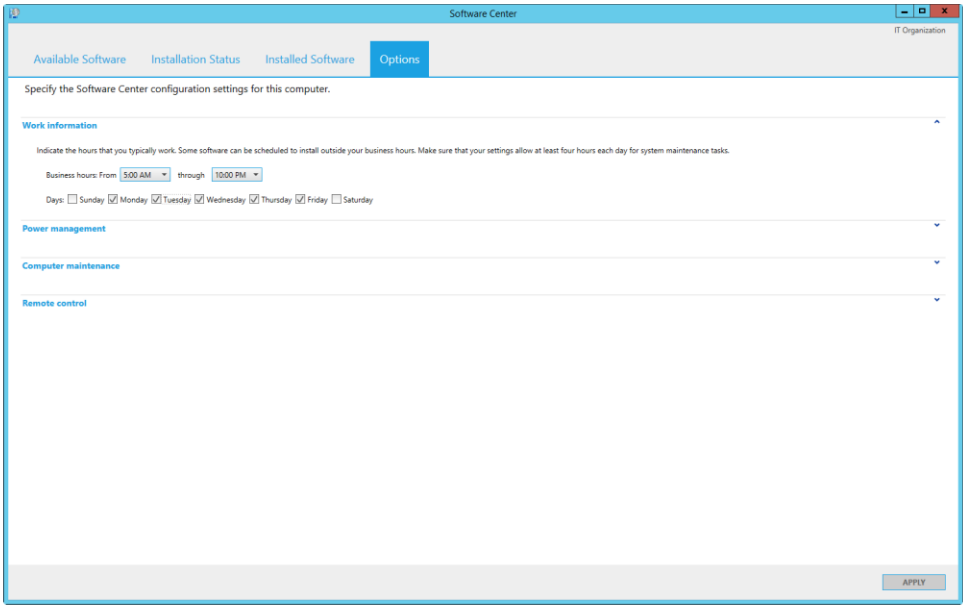
☐ Allow task sequence to run for client on the Internet

Figure 6.19: Deployment User Experience.

- **Alerts** – You can configure alerts for success or failure of the deployment, click **Next**.
- **Distribution Points** – You can configure how the client will interact with content on the distribution point. Set **Deployment options** to **Download content locally when needed by running task sequence**.
- **Summary** – The selected options will appear, click **Next**.
- **Progress** – A progress bar is displayed during the creation of the deployment.
- **Completion** – Success will be reported, click **Close**.

Note: The **Network Access Account**, specified under **Administration → Site Configuration → Sites →** *Site Name* **→Configure Site Components → Network Access Account** must be configured for successful deployment. When the computer reboots into WinPE these credentials provide access to the required components.

After the deployment is configured and set to required, communication between the distribution point and the SCCM client will initiate the deployment process automatically. There is no user interaction on the client system. After the client discovers the available new operating system it will download the needed content to the client and initiate the process. This process will occur only during the times specified in the **Scheduling** page of the **Deploy Software Wizard** and the maintenance period allotted in the **Software Center** on the client system as shown in Figure 6.20.



Specify the Software Center configuration settings for this computer.

Work information

Indicate the hours that you typically work. Some software can be scheduled to install outside your business hours. Make sure that your settings allow at least four hours each day for system maintenance tasks.

Business hours: From 5:00 AM through 10:00 PM

Days: □ Sunday ☑ Monday ☑ Tuesday ☑ Wednesday ☑ Thursday ☑ Friday □ Saturday

Power management

Computer maintenance

Remote control

Figure 6.20: Maintenance Period Scheduling in Software Center.

You may note that the deployment is performed to a device collection when deploying with SCCM. Before you deploy to a large number of computers, the configuration of your deployment should be tested on a smaller scale. It is recommended that this begin with a test deployment to only one or two computers.

To create a device collection for a test deployment to only one computer, follow these simple steps:

1. In SCCM, open **Assets and Compliance**.
2. Select **Device Collections**.
3. Click the **Create** button on the **Home** ribbon to launch the **Create Device Collection Wizard**.
4. The Create Device Collection Wizard presents a number of steps:
    - **General** – Provide a name and any desired comments for the device collection, and then click **Next**.
        - **Membership Rules** – Click **Add Rule** and select **Direct Rule** from the list, then select the intended computer for the test deployment, **Managed Surface Pro 3**, and then click **OK**. Click **Next**.
    - **Summary** – The selected options will appear, click **Next**.
    - **Progress** – A progress bar is displayed during the device collection creation.
    - **Completion** – Success will be reported, click **Close**.

After the test deployment completes successfully, it is recommended to stagger the deployment by performing a small scale pilot before committing to a deployment to all production computers.

Deploying to New or Unknown Computers

Note: SCCM uses two methods to detect computer identity: SMBIOS and MAC address. If the same Surface Ethernet Adapter is used to deploy multiple new or unknown computers, SCCM will recognize them as the same device, since the MAC address of adapter is fixed. If a deployment is limited only to new or unknown computers, the deployment will fail. This issue is addressed in more detail in the Surface Ethernet Adapter section in Chapter 7.

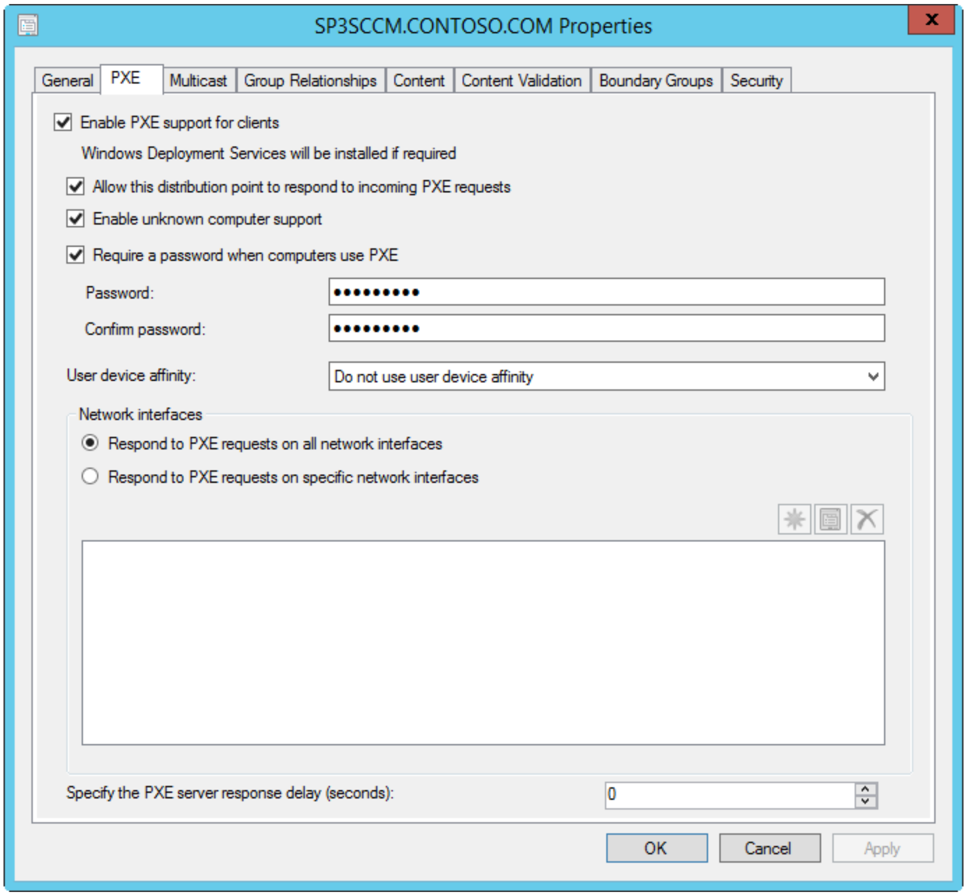
To deploy the task sequence to computers which are unknown to SCCM, a new deployment must be created. This new deployment is required because it must be configured for the default **All Unknown Computers** collection. Follow the steps listed in the prior section for existing SCCM clients, but ensure the following settings are configured:

- **Collection** – Select the **All Unknown Computers** collection.
- **Purpose –** Set the deployment to **Available**, not **Required**.
- **Make available to the following –** Include PXE**.**

If the distribution point is not already configured for PXE boot or to respond to unknown clients, these options will need to be configured by following these steps:

Note: Deployments that are configured as **Required** will be performed automatically when unknown clients boot from PXE. To ensure that undesired operating system deployments are not performed on unknown clients unintentionally, configure operating system deployments with PXE support to be available, rather than required. It is also recommended to configure an administrative password for PXE boot.

1. Select **Distribution Points** in **Administration** in SCCM.
2. Select the distribution point where PXE boot will be configured.
3. Select **Properties** from the **Home** ribbon.
4. Select the **PXE** tab.
5. Select the following options as shown in Figure 6.21:
    - Check the **Enable PXE support for clients** check box
    - Check the **Allow this distribution point to respond to incoming PXE requests** check box
    - Check the **Enable unknown computer support** check box
    - Check the **Require a password when computers use PXE** check box
    - Enter and confirm a strong password for PXE boot



SP3SCCM.CONTOSO.COM Properties

☑ Enable PXE support for clients

Windows Deployment Services will be installed if required

☑ Allow this distribution point to respond to incoming PXE requests

☑ Enable unknown computer support

☑ Require a password when computers use PXE

Password: •••••••••

Confirm password: •••••••••

User device affinity: Do not use user device affinity

Network interfaces

● Respond to PXE requests on all network interfaces

○ Respond to PXE requests on specific network interfaces

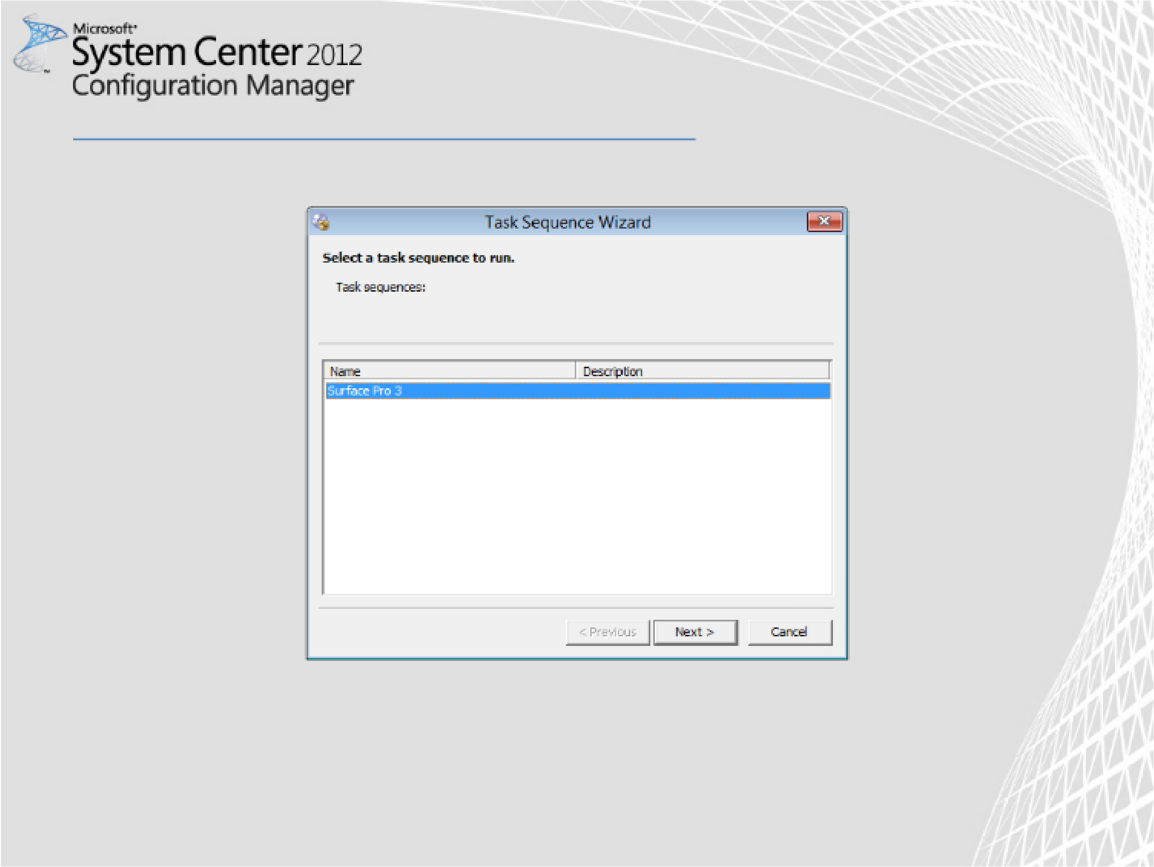
Specify the PXE server response delay (seconds): 0

Figure 6.21: PXE Boot Settings.

6. Click **OK** to close the distribution point properties.

Note: If the deployment servers used in Chapter 3, Chapter 4, or Chapter 5 are located on the same network as the SCCM server, the PXE boot services in WDS should be disabled to prevent conflict for PXE boot clients.

Now that PXE is configured, new clients that are unknown to SCCM will boot from PXE and be provided with the option to deploy the Surface Pro 3 task sequence as shown in Figure 6.22.



Select a task sequence to run.

Task sequences:

Name	Description
Surface Pro 3	

Figure 6.22: PXE Boot Task Sequence Selection.

PART III

ADMINISTRATION

Chapter 7 – Administration Overview

This chapter covers the basics of administering Surface Pro 3 devices in your organization, including an overview of Surface Pro 3 capabilities, tools for administration, and available support. Although the form factor and functionality of Surface Pro 3 devices may differ from other computers in your organization, fundamentally the administration of Surface Pro 3 devices is the same as administration of any other PC, with a few exceptions. In addition to being a portable, touch-capable, tablet platform, Surface Pro 3 devices are also fully functional Windows client systems, just like any other notebook or desktop computer.

Fundamentally Surface Pro 3 devices and other computers in your organization are managed in the same ways, but there are some additional capabilities of Surface Pro 3 that may require different or additional administration. These specific capabilities are covered in Chapter 8.

As described in Chapter 2, due to the difference between a Surface Pro 3 and other computers a user might interact with, it is advised to provide training and support within your organization to help familiarize users with their new devices, especially if they are moving from a device running Windows 7 or earlier. If you don’t train and familiarize users with the device and Windows 8.1, they may become frustrated. Training can be provided by means of documentation or through support channels within your organization, but to help your users get the most out of their new devices, it is recommended to familiarize them with the following topics:

- Windows 8.1
- Touch Screen
- Surface Pro 3 Pen
- Windows Store
- Microsoft Accounts
- Modern and Desktop Applications

Many training resources for the Windows 8.1 operating system and Surface Pro 3 devices are provided in the Appendix of this guide.

Management Tools

Management tools that support PC clients are compatible with Surface Pro 3 devices. This includes the full suite of tools offered by Microsoft including System Center, Windows Intune, management through Active Directory, as well as many third party tools. The Windows 8.1 operating system also provides tools and functionality for management of the system such as backup of data with File History, PowerShell, and management with Exchange ActiveSync.

System Center Configuration Manager

System Center Configuration Manager is a Microsoft on-premises solution for managing client and server computers in an organization. It provides complete management of clients and servers, including operating system deployment as covered in Chapter 6, applications, users, and supports both Windows and third party device management.

Windows Intune

Windows Intune is a cloud based management solution that provides a web-accessible interface for management of your client systems. Unlike SCCM, Windows Intune supports management of Windows clients that are not domain joined and those that do not require connectivity to the corporate network, which can make it an ideal solution for organizations with remote workers or disconnected offices. Windows Intune is not covered further in this guide.

Group Policy

Surface Pro 3 devices joined to active directory (AD) can be managed using the same group policies that are used to manage other Windows client systems. These group policies can be used to control the experience of the Start Screen, access to the Windows Store, and many other components of the Windows operating system. Links to the documentation for management of Windows clients with group policy are found in the Appendix of this guide.

Features

Surface Pro 3 devices include a number of additional features and capabilities above and beyond a standard PC. These features are described in this section. For some of these features, additional processes for administration and deployment may be required, which are detailed in Chapter 8.

Firmware

Surface Pro 3 device firmware is provided as a driver package and can be updated by deploying the latest firmware drivers from the Firmware and Driver pack to the device. This process can be performed during deployment, as is described in Chapter 3. However, when new firmware is deployed to an existing device, the process can be a bit more complicated. The firmware updates are made available through the standard Windows Update channel, so if your Surface Pro 3 device receives updates directly from Windows Update, it will be updated automatically. The firmware updates are not made available for use with Windows Server Update Services (WSUS), so if your organization manages updates with WSUS, the firmware must be deployed separately.

Note: To deploy updated firmware without performing an operating system deployment, the following PowerShell script can be placed in the root folder of the extracted Firmware and Driver Pack. To save this PowerShell script, copy the text into Notepad and save the file as a .ps1 file.

```
$ScriptPath = Split-Path -parent $MyInvocation.MyCommand.Definition
$files = get-childitem -path $Scriptpath -recurse -filter *.inf
foreach ($file in $files)
{
Write-host "Injecting driver $file"
pnputil -i -a $file.FullName
}
```

Asset Tagging

The firmware of Surface Pro 3 devices supports asset tagging, where a customized string used to identify a device can be written directly into the firmware of the device. This enables devices to be easily tracked and identified, even when the operating system is changed through deployment or when the device is passed between users. The process for writing the asset tag is covered in the Asset Tagging section of Chapter 8.

BitLocker Encryption

With both Windows 8.1 Professional and Windows 8.1 Enterprise, Surface Pro 3 devices support encryption of the operating system data using BitLocker Drive Encryption (BDE). Surface Pro 3 devices include a Trusted Platform Module (TPM) that can be used as an authentication factor to automatically unlock a device. This TPM can make encryption an automatic process that occurs behind-the-scenes and protects the data on the device without interfering with the normal boot process of the system.

Surface Pro 3 devices also support using a PIN as an authentication factor, but this needs to be enabled with group policy (covered in the BitLocker Encryption section of Chapter 8). The boot experience with a PIN authenticated device requires a numerical or alphanumeric PIN to be entered before the operating system drive will be decrypted and Windows will begin to load.

Computrace Persistence

Surface Pro 3 devices support persistence of Absolute Computrace, a software for tracking and location monitoring of devices. The firmware persistence prevents the removal of the Computrace agent, even if the device is reset or the Computrace agent is removed.

Miracast Wireless Display

The wireless network adapter of Surface Pro 3 devices supports Miracast wireless connectivity to a display. This ability is compatible with any display that supports Miracast. For displays that do not natively support Miracast the Microsoft Wireless Display Adapter provides the ability to receive Miracast transmissions through an HDMI connection. The Microsoft Wireless Display Adapter also requires a USB connection for power in addition to an HDMI connection on the display.

Accessories

Several accessories are available for Surface Pro 3 devices to enhance the experience or add functionality. These accessories are described in the following sections.

Surface Pen

Surface Pro 3 devices come with the Surface Pen, a Bluetooth connected multipurpose stylus. This pen can provide for accurate input on the touch screen, enable the user to take notes, draw, and provide quick access to a many functions, including right click, erase, and note-taking with OneNote.

Surface Ethernet Adapter

While Surface Pro 3 devices connect easily to wireless networks, in some cases it may be required to connect to a wired network. The Surface Ethernet Adapter provides this functionality as removable USB dongle that provides gigabit ethernet connectivity. The Surface Pro 3 also supports network boot, or PXE when using the Surface Ethernet Adapter. For more information on PXE booting Surface Pro 3 devices, see Chapter 3.

Note: Because the Surface Ethernet Adapter has a fixed MAC address, if you share the adapter among multiple computers, this may cause some issues for software that identifies computers by MAC address. A notable example of this is System Center Configuration Manager, as mentioned in Chapter 6.

Surface Pro 3 Docking Station

The Surface Pro 3 Docking Station provides a stand for Surface Pro 3 devices that includes a power connection and additional connectivity for devices. The Surface Pro 3 docking station includes 3 USB 3.0 ports, 2 USB 2.0 ports, Mini DisplayPort for connectivity to an external monitor, a gigabit ethernet port for connectivity to a wired network, and a 3.5mm audio input and output jack. It can also be anchored by using a provided security slot for Kensington locks.

The design of the Surface Pro 3 Docking Station leaves both the USB 3.0 and Mini DisplayPort on the Surface Pro 3 chassis unblocked. This allows for an additional USB device to be connected and for the Mini DisplayPort to be used even when the Surface Pro 3 device is docked. Therefore, it is possible to connect two external monitors to a single Surface Pro 3 using the docking station Mini DisplayPort and the Mini DisplayPort from the Surface Pro 3 device.

Note: The Surface Pro 3 Docking Station gigabit ethernet port uses the same chipset and connectivity as the Surface Ethernet Adapter and is subject to the same limitations regarding MAC address.

Surface Pro Type Cover

The Surface Pro Type Cover provides protection for the screen when not in-use and a physical keyboard when open. The cover is compatible with the Surface Pro 3 Docking Station, allowing use of the keyboard even when docked.

Support

This section outlines the support options available for your Surface Pro 3 devices.

User Serviceability

You cannot field-service Surface Pro 3 devices. The internal workings of Surface Pro 3 devices are integrated into a single cohesive product that provides optimal performance and reliability. Components that are typically replaceable in standard form factor computers, such as memory, hard drive, and processor, are soldered to the Surface Pro 3 motherboard to form a single unit that cannot be replaced by a user or technician.

In the case of component or device failure, the device must be sent to the authorized Microsoft service center for repair.

Business Support Channels

Microsoft offers two extended warranty plans for business that build upon the standard warranty that comes with Surface. These plans extend the standard warranty up to three years, and can be purchased up to 45 days after your Surface date of purchase.

For all technical issues, you can submit an incident to talk to support representative. For customers who have a Microsoft Premier contract, you can submit a Premier incident with Microsoft Premier Online.

Chapter 8 – Administration Scenarios

For many organizations, Surface Pro 3 devices provide additional functionality beyond that of other devices. This additional functionality also presents a number of administrative tasks that may be new to IT departments, and therefore may present new challenges. In this chapter, these administration scenarios are outlined, along with a step-by-step examples of how these tasks can be managed.

Some of the examples, such as BitLocker encryption and user data migration, can be applied to other computer models and are not exclusive to Surface Pro 3 devices. Many of these administrative tasks are performed during deployment and the procedures described in this chapter can be added to the deployment procedures covered in Part II of this guide.

Asset Tagging

The firmware of Surface Pro 3 devices allows for an asset tag to be written directly into the firmware of the device. This asset tag can be up to 36 characters long and can contain upper and lower case letters, numbers, periods, and hyphens. A command line utility is provided to perform this at the Microsoft Download Center using the following link:

http://www.microsoft.com/en-us/download/details.aspx?id=44076

To configure the asset tag of a Surface Pro 3 device, follow these steps:

1. Download the **AssetTag** tool from the Microsoft Download Center.
2. Extract the downloaded files to a location on the Surface Pro 3 device where they can be easily accessed, for example **C:\AssetTag\**. The path to this location will be used in the following steps to run this program.
3. On the Surface Pro 3 device, open an Administrative Command Prompt.
4. Use the change directory command, **cd**, to change the working directory to the location of the downloaded files as shown in the following:
   ```
   cd C:\AssetTag\
   ```
5. Specify an asset tag with the set option of the **AssetTag** tool, **-s**, as shown in the following where **SP3-Exec001** is the specified asset tag:
   ```
   AssetTag -s SP3-Exec001
   ```
6. Close the command prompt.

After the asset tag is set, the **-g** option can be used with the **AssetTag** tool to show the current asset tag:

```
AssetTag -g
```

BitLocker Encryption

Like all Windows 8.1 Professional or Enterprise devices, Surface Pro 3 devices support BitLocker drive encryption. Surface Pro 3 devices include a Trusted Platform Module (TPM) that can be used as an authentication factor for decryption of the operating system drive. Surface Pro 3 also includes support for the On Screen Keyboard during the preboot experience to allow PIN authentication.

Enabling PIN Authentication on Surface Pro 3

Although the on-screen keyboard is provided in the preboot environment on Surface Pro 3 devices, keyboard input is not always provided by other touch devices, such as Surface Pro 2. To ensure that Surface Pro 2 devices are not configured for PIN authentication and thus resulting in a tablet that requires a PIN at boot, but no interface to enter that PIN, a group policy is included in Windows Server 2012 or later that prohibits tablet devices (formerly known as slate devices) from using PIN authentication. The **Enable use of Bitlocker authentication requiring preboot keyboard input on slates** group policy can be used to enable PIN authentication on Surface Pro 3 devices.

It is recommended that this group policy be applied only to Surface Pro 3 devices or other devices with support for the onscreen keyboard in the preboot environment. If this policy is enabled for devices without preboot keyboard support, they will require a physical keyboard to be connected to move past the PIN authentication prompt.

Encrypting During MDT Deployment

The Microsoft Deployment Toolkit (MDT) can perform encryption during the deployment process. Having the encryption performed during deployment both increases the efficiency of the encryption process and ensures that devices are encrypted from the moment they enter the hands of end users.

Note: It is recommended to store BitLocker recovery keys when performing a deployment with encryption. The recovery keys can be stored in Active Directory with the **Choose how BitLocker-protected operating system drives can be recovered** group policy. They can also be stored with Microsoft BitLocker Administration and Management (MBAM), a tool provided by the Microsoft Desktop Optimization Pack (MDOP). If a policy for storing the recovery key is not set, MDT will enable BitLocker but the recovery key will not be stored.

The BitLocker encryption steps are automatically enabled in task sequences created through the **Standard Client Task Sequence** template. These steps will run to enable BitLocker when the option to encrypt the deployed computer is selected in the **Windows Deployment Wizard**. If the **Windows Deployment Wizard** is suppressed, the option to encrypt must be configured through rules in the **customsettings.ini** file. To configure rules to enable encryption only on Surface Pro 3 devices, use the model variable as described in the Customizing Task Sequence Selection by Model section of Chapter 5.

To configure **customsettings.ini** for encryption of Surface Pro 3 devices, add the following rules to the **[Surface Pro 3]** section.

- **BDEInstallSuppress** – This rule should be set to **NO** to ensure that BitLocker Drive Encryption will not be suppressed.
- **BDEAllowAlphaNumericPin** – This rule can be set to **YES** to enable letters and numbers in the PIN for BitLocker. It can be set to **NO** to allow only numbers in the PIN.
- **BDEDriveLetter** – The default drive letter for the operating system partition during deployment is **S:**, set this rule to **S:**.
- **BDEDriveSize** – This rule defines the size of the BitLocker system partition in MB. In the provided example this partition is set to 1000MB, or almost 1GB.
- **BDEInstall** – This rule defines the protectors used to authenticate access to the encrypted data. This rule can be configured to **TPM** to enable only the TPM protector, or to **TPMPin** if the group policy governing the Surface Pro 3 device will be configured to allow use of a PIN.

- **BDEPin** – This rule is used to define a PIN if the setting in **BDEInstall** is configured to use a PIN protector.
- **BDERecoveryKey** – This rule can be set to **AD** to instruct that the BitLocker recovery key should be backed up to Active Directory.

The resulting rules will match the following:

```
[Surface Pro 3]
SkipTaskSequence=YES
TaskSequenceID=SP3Win8.1EntCst
BDEInstallSuppress=NO
BDEAllowAlphaNumericPin=YES
BDEDriveLetter=S:
BDEDriveSize=1000
BDEInstall=TPMPin
BDEPin=12345678
BDERecoveryKey=AD
BDEKeyLocation=C:
```

Pen Pairing

The Surface Pen provided with Surface Pro 3 works as a stylus to make writing or drawing on the Surface Pro 3 easy and accurate and also provides a number of additional functions through a series of buttons. These buttons communicate with the Surface Pro 3 device through Bluetooth communication. In the original setup of a Surface Pro 3 device, a wizard is displayed that facilitates this pairing. When you deploy a Windows image to a Surface Pro 3 device, this pairing is not done automatically and must be run after deployment.

This pairing procedure can be run manually in the computer's Bluetooth settings, in the same way that other Bluetooth devices would be paired. This solution can be easy and effective if a technician is preparing the device for an end user, but in many cases the end user may be left with the task of performing the pairing operation. It is possible to restore the out-of-box experience for pairing the Surface Pen by capturing the wizard from a Surface Pro 3 with the original installation and including it in the image for deployment to Surface Pro 3 devices.

To capture and inject the Surface Pen pairing wizard, follow these steps:

1. On a Surface Pro 3 with the original image, locate the following files:
   - C:\Windows\system32\oobe\info\default\1033\oobe.xml
   - C:\Windows\system32\oobe\info\default\1033\PenPairing_en-US.png
   - C:\Windows\system32\oobe\info\default\1033\PenError_en-US.png
   - C:\Windows\system32\oobe\info\default\1033\PenSuccess_en-US.png
2. Copy these files to a temporary location on your deployment server.
3. Locate the path of the image file used for deployment in the deployment share. The WIM file will be located under the **Operating Systems** folder in a subfolder named when the image was imported into the deployment share.
4. On the deployment server, launch **Deployment and Imaging Tools Environment** from the Start Screen. This provides access to the image servicing tool, called Deployment Image Servicing and Management (DISM). Alternatively, if your deployment server is running on Windows 8 or Windows Server 2012 or newer, DISM is available by opening an Administrative command prompt.

5. Type the following command using the **/WIMFile:** option with **DISM** to specify the path you located in Step 3 to mount the image in the folder **C:\Mount** for editing:
```
DISM /Mount-WIM /WIMFile:C:\Install.wim /Index:1 /MountDir:C:\Mount
```

6. Browse to the **C:\Mount\Windows\System32\oobe\info\default\1033** folder in File Explorer. If any of these folders do not exist, they should be created at this time.
7. Copy the files from Step 2 into this folder.
8. Close File Explorer to ensure that no files in the **C:\Mount** folder are held open.
9. Run the following command to unmounts the WIM file:
```
DISM /Unmount-WIM /MountDir:C:\Mount /Commit
```

10. Close **Deployment and Imaging Tools Environment**.

Note: A Surface Pro 3 device can be updated to enable a quick note-taking experience with the Surface Pen and OneNote. To enable this functionality, install these Windows updates:

- KB2968599 – Quick Note-Taking Experience Feature for Windows 8.1
- KB2978002 – August 2014 update for Quick Note-Taking Experience feature in Windows RT 8.1 and Windows 8.1
- KB2881082 – July 8, 2014 update for OneNote 2013

Migrating User Data

In many scenarios, such as when a computer is replaced with another or when a deployment is being used to refresh a computer already in use, a user's data must be backed up and then restored to the new environment. In these cases, the User State Migration Tool (USMT) can make the process of transferring this data easy and simple. USMT is installed as part of the Windows Assessment and Deployment Kit (Windows ADK) and is integrated with both MDT and SCCM to provide automation and management.

Migrating Data in Replace Scenarios

In replacement scenarios where a user is changing between devices and needs the data from the retiring device moved to the replacement device, USMT can be used to back up the user's data to the network and recover it on the new computer. The initial backup of the user's data can be performed manually with USMT, or can be performed with a task sequence created from the **Standard Client Replace Task Sequence** template. To configure a replace task sequence to be run on the retiring computer, follow these steps:

1. Launch the **Deployment Workbench** from the Start Screen.
2. Expand the deployment share and select the **Task Sequences** folder.
3. Click **New Task Sequence** in the **Actions** pane to launch the **New Task Sequence Wizard**.
4. The **New Task Sequence Wizard** presents the following steps:
    - **General Settings** – Specify a name, ID, and comments to identify the replace computer task sequence, then click **Next**.
    - **Select Template** – Choose **Standard Client Replace Task Sequence** from the drop down menu and click **Next**.

   - **Summary** – This page will present a summary of the specified options, click **Next**.
   - **Progress** – This page will display a progress bar during task sequence creation.
   - **Confirmation** – A confirmation of the successful creation of the task sequence will be shown, click **Finish** to close the **New Task Sequence Wizard**.
5. Close the **Deployment Workbench**.

The replace computer task sequence performs three primary tasks:

- Capturing the user state including user data with USMT
- Performing an image based backup of the retiring computer
- Wiping the disk

For each of these tasks to run on the retiring computers, the rules of the deployment share must be altered to either allow the prompts for these actions to be displayed in the Windows Deployment Wizard or to specify actions based on variables. As shown in the deployment task sequences in Chapter 5, the deployment share rules can be configured to perform actions based on the computer model. This might be useful when retiring a specific model from use in your organization, but more commonly the computers to be retired are more specific. To specify an individual computer where the replace computer task sequence and subsequent prompts or actions should be run, the MAC address can be used.

To specify rules by MAC address, the priority of rules must be altered. Add the MAC address variable to the rules priority by modifying the **[Settings]** section of the deployment share rules to the following:

```
[Settings]
Priority = MACAddress, Model, Default
Properties=MyCustomProperty
```

To configure rules for a MAC address where the prompts for user data migration and backup will be displayed, add the following section to your deployment share rules where *00:00:00:00:00:00* is the MAC address of the target computer.

```
[00:00:00:00:00:00]
SkipComputerBackup=NO
SkipUserData=NO
```

This configuration will cause the **Windows Deployment Wizard** to prompt if a computer backup should be made, or if the user data should be stored for migration to another system to be displayed. To wipe the disk of the retiring computer, add the line **WipeDisk=TRUE** to section identified by the MAC address.

The backup of user data can also be specified without the display of the prompts. For example, to instruct the data to be written to a share on the deployment server, use the following rules:

```
[00:00:00:00:00:00]
SkipComputerBackup=YES
SkipUserData=YES
UserDataLocation=NETWORK
UDShare=\\SP3ProdDeploy\UserData
```

```
UDDir=%OSDComputerName%
```

This will create a folder with the computer name on the share **UserData** on the deployment server. The user credentials specified in the rules or when launching the **Windows Deployment Wizard** must have write permission to this share.

Note: The replace computer task sequence requires no image files and thus is very lightweight. A potential solution to allow the rules for the deployment share to remain unaltered while providing a separate experience for running the replace computer task sequence is to create offline boot media with the replace computer task sequence.

Rules must also be configured for the deployed computer to select the backed-up data. As with the retiring computer, the MAC address can be used to isolate the rules to the replacement computer. The following rules are very similar to those used to back up the user state, with the exception of adding the **UDDir** rule, which indicates the folder where the backup resides. The computer name of the deployed computer will likely not match the computer name of the retiring computer, so to ensure that the correct directory is used, the computer name of the retiring computer should be explicitly defined.

```
[00:00:00:00:00:00]
SkipComputerBackup=YES
SkipUserData=YES
UserDataLocation=NETWORK
UDShare=\\SP3ProdDeploy\UserData
UDDir=RetiringComputer
```

Migrating Data in Refresh Scenarios

In some scenarios, a new operating system image may be deployed to an existing computer that will continue to be used by the same user. This is the refresh scenario, where the user's data should be restored to the same system where it is backed up. The replace scenario rules will still work for a refresh scenario, but can be greatly simplified and performance increased by using *hardlink* storage of the user data. With hardlink storage, the user's data is not removed from the system but kept on the storage device and restored when the new image has been deployed.

Unlike the replace scenario, a replace computer task sequence is not required to back up user data. Modify the **[Surface Pro 3]** section of the rules for the production deployment share shown in the Customizing Rules for Automation section of Chapter 5 to match the following configuration:

```
[Surface Pro 3]
SkipTaskSequence=YES
TaskSequenceID=SP3Win8.1EntCst
SkipComputerBackup=YES
SkipUserData=YES
UserDataLocation=AUTO
UDShare=\\SP3ProdDeploy\UserData
UDDir=%OSDComputerName%
```

These rules specify that the Surface Pro 3 deployment task sequence should be run on all Surface Pro 3 models boot from this media and that any user data should be backed up using hardlinks if possible, or the network location if it is not possible. When **UserDataLocation** is set to **AUTO**, the deployment process will determine if there is enough room on the hard drive to keep the data during deployment. If there is not enough room, it will fall back on the **UDShare** and **UDDir** network location.

System Tracking

Surface Pro 3 devices include native support for Absolute Computrace device tracking software. This solution includes a separate application that must be installed in the deployed client environment to facilitate tracking. This agent is available through the Customer Center for subscribers to the service at the following link:

https://cc.absolute.com/

The support for Computrace includes BIOS persistence, the ability of the Surface Pro 3 firmware to ensure that the software remains installed even if the device is reset or wiped. This functionality is built in and will automatically activate when the agent is installed and activated.

Deploying Computrace with MDT

Deployment of the Computrace agent with MDT is very simple. Follow the steps in the Importing Applications section of Chapter 5 and import the installation files downloaded from the Absolute Customer Center. Use the following command to install the software silently:

```
computrace.exe -sp/s
```

To ensure deployment of the agent, add an application installation step to the Surface Pro 3 deployment task sequence as covered in the Importing Applications section of Chapter 5 and specify the Computrace agent for installation.

PART IV

APPENDIX

References

Description	Type	Link
The Deployment Guys	Blog	http://blogs.technet.com/b/deploymentguys/
Windows for IT Pros	Blog	http://blogs.windows.com/itpro/
How to Update the Surface Pro 3 Firmware Offline using a USB Drive	Blog Post	http://blogs.technet.com/b/askpfeplat/archive/2014/10/20/how-to-update-the-surface-pro-3-firmware-offline-using-a-usb-drive.aspx
Deploying Drivers and Firmware to Surface Pro	Blog Post	http://blogs.technet.com/b/deploymentguys/archive/2013/05/16/deploying-drivers-and-firmware-to-surface-pro.aspx
MDT and MDT Documentation Download	Download	http://technet.microsoft.com/windows/dn475741
Licensing Brief - Reimaging Rights	Download	http://www.microsoft.com/licensing/about-licensing/briefs/reimaging.aspx
Windows ADK for Windows 8.1 Update	Download	http://www.microsoft.com/en-US/download/details.aspx?id=39982
Surface Pro 3, Surface Pro 2, and Surface Pro firmware and driver packs	Download	http://www.microsoft.com/en-us/download/details.aspx?id=38826
Office Deployment Tool	Download	http://www.microsoft.com/en-us/download/details.aspx?id=36778
Surface Pro 3 Asset Tag CLI Utility	Download	http://www.microsoft.com/en-us/download/details.aspx?id=44076
Group Policy Settings Reference for Windows and Windows Server	Download	http://www.microsoft.com/en-us/download/details.aspx?id=25250
TechNet Evaluation Center	Download	http://www.microsoft.com/en-us/evalcenter/
Windows 8.1 Update User Readiness Toolkit	Download	http://www.microsoft.com/en-us/download/details.aspx?id=42255
Microsoft Wireless Display Adapter	Product Page	http://www.microsoftstore.com/store/msusa/en_US/pdp/Microsoft-Wireless-Display-Adapter/productID.308216600
System Center 2012 R2 Configuration Manager	Product Page	http://www.microsoft.com/en-us/server-cloud/products/system-center-2012-r2-configuration-manager/
Microsoft Support Services Site	Support	http://www.microsoft.com/en-us/microsoftservices/proactive_support_services.aspx

Microsoft Premier Support Site	Support	http://premier.microsoft.com/
Active Directory-Based Activation Overview	TechNet Article	http://technet.microsoft.com/library/hh852637
Windows 8.1 Deployment Jump Start	Video	http://www.microsoftvirtualacademy.com/training-courses/windows-8-1-deployment-jump-start
Windows 8.1 User Readiness Toolkit	Video	http://www.microsoftvirtualacademy.com/training-courses/windows-8-1-user-readiness-toolkit
Microsoft Surface Site	Web Site	http://www.microsoft.com/surface
Windows for IT Pros Site	Web Site	http://technet.microsoft.com/en-us/windows
Unattended Windows Setup Reference	Web Site	http://technet.microsoft.com/library/ff699026
Windows Deployment Tools Technical Reference	Web Site	http://technet.microsoft.com/library/hh825039
VAMT Technical Reference	Web Site	http://technet.microsoft.com/library/hh824825
Surface Pro 3 Update History	Web Site	http://www.microsoft.com/surface/en-us/support/install-update-activate/pro-3-update-history?lc=1033
BitLocker Overview	Web Site	http://technet.microsoft.com/library/hh831713