Deploying operating system images on Dell Business Client Systems using Microsoft® Deployment Toolkit (MDT) 2013

A Dell™ Technical White Paper

Dell Client Product Group
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Deploying operating system images on Dell Business Client Systems using Microsoft® Deployment Toolkit (MDT) 2013

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Introduction

IT Departments typically manage a mix of decentralized client hardware and software applications. IT administrator activities include deploying standardized corporate operating system images to client hardware. This activity requires, using a consistent mechanism to gather application software, hardware, and operating system information, and deploy the appropriate software over the network from a central management console.

The Microsoft® Deployment Toolkit (MDT) 2013 provides unified processes and tools for desktop and server operating system deployment using a common deployment console and a collection of best practices. The toolkit provides a single mechanism for image creation and an automated installation process to reduce deployment time.

MDT can be used in two different operational environments -

- Lite Touch Installation (LTI) - Used primarily when software distribution tools like System Center Configuration Manager are not available.
- Zero Touch Installation (ZTI) – Used as an extension of the operating system deployment capabilities available with Configuration Manager.

This technical paper primarily focuses on using the LTI installation mechanism along with Deployment Workbench for deployment of operating systems on Dell client systems using the Dell Command driver packs. The Dell Command Deploy Driver Pack helps simplify the deployment of customized images on Dell hardware. While the installation steps detailed in this white paper are LTI-specific, the installation process resembles the ZTI installation method that uses the underlying Configuration Manager capabilities to deploy operating systems. The intended audiences for this white paper are IT and network administrators or managers who need to understand the technical aspects of creating and deploying their own customized images on Dell Client Systems.
Required software

- Dell Command | Deploy WinPE driver pack
- Dell Command | Deploy driver pack
- Windows Assessment and Deployment Kit (ADK)
- Networking services, including Domain Name System (DNS), Windows Deployment Services and Dynamic Host Configuration Protocol (DHCP)
- Windows 10 Installation Media
Dell Command | Deploy driver pack overview

Dell Command | Deploy driver packs are available on Dell support website and offers a new level of ease and flexibility to create and deploy customized operating system images on Dell systems.

The key capabilities that are provided by the Dell Command Deploy Driver Packs are:

- The availability of all system-applicable drivers in a single archive.
- The flexibility to manage and deploy corporate standard images on Dell client systems by providing drivers in Windows native plug-n-play format (.inf and .sys) that are directly consumable by deployment consoles.

With the Dell Command Deploy Driver Pack IT administrators can perform the following tasks:

- Use Microsoft recommended best practices for operating system deployment.
- Use Windows operating system-based PnP enumeration capabilities to install drivers for applicable devices.
- Create a system-level optimized deployment sequence.

The Driver Pack include two different components:

- Windows Pre-installation (WinPE) driver pack – The driver packs needed for WinPE within MDT to boot the remote client system, access the hardware, and for the network to access the infrastructure.
- System specific driver packs – The driver packs include the drivers that are needed to get the target operating system functional on a system.

Following sections provide details on the content and intended use of each of these individual driver packs.

1.1 Locating the driver packs

Customers can locate the relevant driver packs for their system using the following steps:

1. Go to https://support.dell.com or your regional Dell Support Website.
2. Select the system model for the operating system deployment driver pack. For reference, Dell Latitude 7400 laptop is used in this white paper.
3. Select the Windows operating system that is going to be deployed.
4. Expand the Systems Management node on the results page to locate the WinPE 10 driver pack and the Platform-specific driver pack (Dell Command | Deploy Latitude 7400 Windows 10 driver pack).
5. To see the list of drivers that are updated as part of the driver pack, go to https://dell.com/command.
6. Click Dell Command | Deploy, scroll through the list, and click the respective Driver Pack for your system.
1.2 Driver pack content structure

All Dell driver packs use the file naming structure <Model>-<OS>-<Version>.cab. So a Windows 10 driver pack for Latitude 7400 would be named as 7400-win10-A01-HFPMF.CAB.

Any of the system driver pack can be viewed and/or edited using either Windows Explorer or WinZip. A typical system cabinet file structure for a Latitude 7400 laptop is displayed in Figure 1.

![Typical system cabinet file structure](image)

Figure 1. Typical system cabinet file structure

After the driver pack is extracted, the Readme.txt and Manifest.xml provides details of the contents. The manifest file includes specifics such as:

- Driver versions
- Release date
- Supported devices

1.3 WinPE driver packs

As noted earlier, Dell releases two sets of driver packs. The WinPE driver pack is used to customize the Lite-Touch WinPE available within MDT. The WinPE driver pack provides the necessary network and storage drives for a pre-OS environment setup on Dell clients that enables communication with the MDT Console. The WinPE driver pack also contains Readme.txt and Manifest.xml files that detail the drivers that are included within the package.
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For the latest release of the WinPE driver pack, go to [http://support.dell.com](http://support.dell.com) or [https://dell.com/command](https://dell.com/command), click Dell Command | Deploy, and search for WinPE Driver Pack.
2 MDT operational details

For reference, the task of deploying a Windows 10 on Dell Latitude 7400 laptop using MDT 2013 and Windows Deployment Services enabled using PXE infrastructure are used in this white paper. A user is expected to be familiar with the different MDT operating system deployment screens. MDT 2013 Deployment Shares contain operating systems, applications, operating system packages, and device drivers.

The following image shows an example of the Deployment share tree contents:

![MDT Deployment Share](image)

Figure 3: MDT Deployment Share

2.1 Managing Out of Box Drivers

To facilitate driver management, it is recommended to organize drivers as shown in Figure 4. Right-click Out of Box Drivers and create the folder structure as shown in the following image:
Organizing drivers by putting them into groups provides a few key benefits:

- The ability to manage drivers over time as new operating system deployment driver packs become available.
- Removing redundant driver packs from the out-of-box driver category.
- Managing drivers using a system and operating system combination, rather than importing them into a flat database.
- Creating targeted deployment sequence by using category grouping.

It is recommended to use the ModelNos-OS-Architecture-PackageVersion naming to distinguish different driver groups for a couple of key reasons:

- Grouping content using a model and operating system combination provides better targeting.
- Since Dell refreshes drivers often, customers can clean out older revisions from their driver store.

In MDT 2013, the drivers from driver pack can be imported directly by pointing to the folder containing extracted drivers.

1. Download the driver pack from [https://support.dell.com](https://support.dell.com) into a local directory.
2. Select **MDT Driver Package Import** and browse the local directory where the driver pack file is downloaded and extracted.

   Note: A WinPE driver group was created to manage pre-OS deployment and not the target operating system drivers.
2.2 Selection Profiles

MDT 2013 selection profiles enables a user to select one of more folders in the Deployment Share to perform specific actions. Selection profiles are used with Task Sequence to inject drivers for a specific system and/or WinPE drivers.

Figure 6 shows the creation of a new profile to deploy drivers for a Latitude 7400 that runs the Windows 10 operating system. The 7400 folder which was created for out-of-box driver is used for this new selection profile.
2.3 Setting up Lite-Touch WinPE

After the applicable drivers are imported, you must create a Lite-Touch WinPE that is needed to launch a pre-installation WinPE operating system on the target client system. Right-click the MDT Deployment Share > Properties > WinPE.

Figure 7 displays the screen shot for selecting x64 profile for WinPE (x64 WinPE) to create a customized WinPE using the imported WinPE driver pack. Similarly, for x86 WinPE image, select x86 in the drop-down box and the corresponding WinPE (winpe-x86) profile.
After the driver group is selected, the MDT WinPE setup wizard performs the following steps:

1. Generate the WinPE source directory.
2. Selects the drivers for the WinPE image.
3. Copies the files necessary to build the ISO image.
4. Captures the WinPE Lite WIM image.

You must select the option to build the WIM and the ISO Image for WinPE. The WIM format is used by the Windows deployment services for a PXE boot.
2.4 Setting up operating system images

MDT offers multiple ways to set up operating system images as shown in Figure 8.

![Import Operating System Wizard](image)

**Figure 8: Operating system Import options**

- Using the original installation CD.
- Using the Custom image file in WIM format; captured from a deployed system or a factory installed image.
- Using a Windows deployment services image.
For this white paper, the original Window operating system WIM file by Microsoft is used. The screen in Figure 9 shows an example of a Windows operating system image imported from OEM installation media.

![Windows 10 Pro in install install.wim Properties](image)

**Figure 9: Windows operating system image imported from install media**

### 2.5 Setting up Task Sequence

The next step in the process is to set up a task sequence and update the deployment points. This step involves selecting the operating system image, entering any associated product identification key, and then modifying the task sequence itself to select drivers. This task is performed in the **General Settings** screen, as shown in Figure 10.
After the task has been set up, right-click the task to modify its properties. Figure 11 shows a fully operational task sequence where Latitude 7400 profile is selected.
2.6 Windows Deployment Services Configuration

After the deployment points have been configured, download Lite-Touch WinPE to the client for deployment through the PXE request process. This process involves selecting the WinPE built using the deployment workbench and provisioning it to respond to PXE requests. Figure 12 shows a sample configuration for DHCP.

1. Go to the Windows Deployment Services Configuration console.
2. Right-click the Windows Deployment Services server and select Properties.
3. Go to the PXE Response tab, and select Respond to all Client Computers (known and unknown).
4. Check the option to configure DHCP option 60 to have the server respond to clients.
5. Select the Lite-Touch WinPE image that was built using the deployment workbench console from the **Boot** tab of Windows Deployment Services Server.

6. After the images are added, boot the target client system.

7. The client connected to the PXE server retrieves the specified boot image and initiates the operating system installation steps.

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**Figure 12: Adding WinPE Image to Windows Deployment Server Console.**

### 2.7 Dell Command | Deploy Driver Pack catalog

The Dell Command | Deploy Driver Pack Catalog contains metadata about the latest system and WinPE Driver Packs released by Dell. It enables customers to locate and download the latest Dell Command | Deploy Driver Packs with the automation method of their choice.


Driver Pack Catalog is an .xml file and is a traversable list of System and WinPE Driver Packs applicable to Dell Enterprise class systems.

Check the blog of Dell TechCenter RockStar, Dustin Hedges where he automatically gets his driver packs by using the driver pack catalog. MDT guru, Keith Garner has a [script for MDT (with a video tutorial)](https://www.youtube.com/watch?v=0z5p1Qz7R8Y) as well.
Putting it all together

Here is a summary of how to deploy a custom image created by any organization. For reference, Windows 10 is deployed on Dell Latitude 7400.

1. Ensure that the appropriate operating system WIM images are in place for deployment.
2. Set up the WinPE and the operating system driver packages as outlined in the previous sections.
3. Create a task sequence using the wizard default steps with appropriate title – Latitude 7400 Windows 10 deployment.
4. After the task sequence is created, select the task sequence to edit it.
5. Add steps for additional add-on drivers.
   Multiple add-on driver steps must match the driver package with the target operating system. This process enables the usage of the same task sequence on multiple Dell systems.

It is recommended to install the Dell Command | Update (DCU) to get the latest applicable software updates for your specific system. To download DSS, go to https://support.dell.com and select your system model to download the appropriate version.

Driver Pack editing Tools

IT administrators must extract the Driver Packs and add the drivers that are needed for the configurations they support. Windows Explorer supports native viewing of Driver Pack contents. You can also use WinZip to examine the contents of the Driver Pack.

Supported Dell hardware and operating system

To see the supported hardware models and the latest driver pack release schedule, go to https://dell.com/command and click Dell Command | Deploy.
References

Deploy a Windows 10 Image Using MDT

Dell Command | Deploy Driver packs for Enterprise Client OS Deployment