

Microsoft Diagnostics and Recovery Toolset Deployment Guide

Microsoft Diagnostics and Recovery Toolset (DaRT) provides a set of tools that help IT shift desktop repair planning from reactive to proactive, saving time and reducing the challenges associated with troubleshooting and repairing desktop system failures. This guide helps you choose among DaRT deployment methods, and it provides step-by-step guidance for each.

Microsoft®
**Diagnostics and
Recovery Toolset**

Introduction

Many IT departments take a proactive approach to planning data protection, but they fall back to reactive tendencies when recovering from PC failures. The most common solution is to reimage PCs, but that can cause lost settings, personalization, and even data. DaRT can help you save time and reduce challenges associated with troubleshooting and repairing PC failures—providing a less frustrating experience for IT and end users.

DaRT helps IT easily recover PCs that have become unusable, rapidly diagnose probable causes of issues, and quickly repair unbootable or locked-out systems, all without leaving their desks—and much faster than the average time it takes to reimage the machine. DaRT allows administrators to shift desktop repair planning from reactive to proactive, saving time and reducing the challenges associated with troubleshooting and repairing system failures. With a plan in place, the simple image creation process, coupled with an easy to use tool menu, allows organizations to rapidly deploy, use, and benefit from the toolset.

DaRT 8 is the newest version of the toolset, and it is part of the MDOP 2012 release. It carries forward all the enhancements that DaRT 7.0 introduced, such as support for remote connections to the PC and more deployment methods, and it adds many new features (Table 1).

Table 1—New Features in DaRT 8

Support for new software and hardware platforms:	A reimagined DaRT Recovery Image Wizard:	Improved Windows PowerShell scripting:
<ul style="list-style-type: none"> Support for Windows 8 and Windows Server 2012 Support for GUID Partition Tables (GPTs) Transparent Unified Extensible Firmware Interface (UEFI) machine boot integration 	<ul style="list-style-type: none"> Built on Windows PowerShell cmdlets Native support for USB media deployment Support for WIM and ISO image file formats Ability to create 32- and 64-bit images on a single PC 	<ul style="list-style-type: none"> Four new DaRT cmdlets Scripting DaRT recovery images is similar to scripting other imaging processes End-to-end scripting enabled by DISM cmdlets

This guide describes how to install DaRT and its prerequisites. It also compares the deployment methods available for DaRT to help you choose the best solutions for your environment; then it offers step-by-step instructions for each method. Methods in this guide are:

- Removable discs and USB media
- Manual installation to the local hard drive
- Installation to the local hard drive by using System Center 2012 Configuration Manager
- Installation to the local hard drive by using Microsoft Deployment Toolkit 2012 (MDT 2012)
- Delivery to PCs as a network service by using Windows Deployment Services (Windows DS)

Installing DaRT and Prerequisites

Table 2 lists the software required to install DaRT and create recovery images by using the DaRT Recovery Image Wizard. When you download DaRT 8, download the version that matches the system type of the PC onto which you are installing it and running the DaRT Recovery Image Wizard. Similarly, download the Windows 8 media that matches the system type of the recovery images you are creating. If you support both types of PCs, x86 and x64, download the x86 and x64 Windows media.



The computer onto which you install DaRT 8 and run the DaRT Recovery Image Wizard must be running Windows 8 or Windows Server 2012.

Table 2— Required Software

Title	Description	URL
DaRT 8 x64	Download the x86 or x64 version of the installer file, depending on the system type of the PC on which you are installing DaRT and running the DaRT Recovery Image Wizard.	https://www.microsoft.com/Licensing/servicecenter http://msdn.microsoft.com/subscriptions/downloads/ http://technet.microsoft.com/en-us/subscriptions/downloads/
Windows Assessment and Deployment Kit (ADK)	DaRT requires the deployment tools and Windows Preinstallation Environment (Windows PE) from the Windows ADK.	http://download.microsoft.com/download/9/9/F/99F5E440-5EB5-4952-9935-B99662C3DF70/adk/adksetup.exe

Title	Description	URL
Windows Driver Kit 8	In DaRT, Crash Analyzer requires the Windows 8 Debugging Tools from the Windows Driver Kit to analyze memory dump files.	http://download.microsoft.com/download/2/4/C/24CA7FB3-FF2E-4DB5-BA52-62A4399A4601/wdk/wdksetup.exe
Windows 8 x64 ISO image	DaRT requires the Windows Recovery Environment (Windows RE) image from the Windows 8 media. Download the x86 or x64 version of Windows 8, depending on the type of DaRT recovery image you are creating. If you support both system types in your environment, download both versions of Windows 8.	https://www.microsoft.com/Licensing/servicecenter http://msdn.microsoft.com/subscriptions/downloads/ http://technet.microsoft.com/en-us/subscriptions/downloads/

Installing the Windows ADK

The Windows ADK is a prerequisite for DaRT 8. In particular, DaRT requires two features: the Deployment Tools (tools to customize, deploy, and service Windows images) and Windows PE (a minimal operating system for starting a computer).

To install the Windows ADK

1. Run `adksetup.exe` from the folder into which you downloaded the Windows ADK.
2. Complete each page of the Assessment and Deployment Kit setup wizard:

Page	Steps
Specify Location	Click Next to install the Windows ADK in the default installation location.

Page	Steps
Join the Customer Experience Improvement Program (CEIP)	Click Yes , and click Next .
License Agreement	Review the license agreement, and click Accept to accept it.
Select the features you want to install	<ol style="list-style-type: none"> Deselect all features except for: <ul style="list-style-type: none"> Deployment Tools Windows Preinstallation Environment (Windows PE) Click Install to begin installing the Windows ADK.
Installing features	Monitor installation progress.
Welcome to the Assessment and Deployment Kit!	Click Close to close the Assessment and Deployment Kit setup wizard.

Installing the Windows Driver Kit

One of the prominent tools in DaRT 8 is Crash Analyzer, and it requires the Windows 8 Debugging Tools from the Windows Driver Kit 8. Crash Analyzer uses the debugging tools to analyze memory dump files and display results in an easy to read format. Although the debugging tools are not required to install DaRT, Microsoft recommends installing them and including them in recovery images to get full value from the toolset.

To install the Windows Driver Kit

1. Run wdksetup.exe from the folder into which you downloaded the Windows Driver Kit.
2. Complete each page of the Windows Driver Kit wizard:

Page	Steps
Specify Location	Click Next to install the Windows Driver Kit in the default installation location.
Join the Customer Experience Improvement Program (CEIP)	Click Yes , and click Next .
Important Information!	After reviewing the information on this page, click Next .
License Agreement	Review the license agreement, and click Accept to accept the license terms.
Installing features	Monitor installation progress.
Welcome to the Windows Driver Kit!	<ol style="list-style-type: none"> 1. Deselect the Download WDF co-installers check box. 2. Click Close to close the Windows Driver Kit wizard.

Installing DaRT

Microsoft provides both x86 and x64 versions of the DaRT 8 installation file. Install the version that matches the system type of the PC onto which you're running the DaRT Recovery Image Wizard—not the system type of the recovery image you're creating. Both versions can create x86 or x64 recovery images.

In neither case can the DaRT Recovery Image Wizard create cross-platform media. That is, you can use either version of DaRT to create an x86 recovery image or an x64 recovery image. You cannot create one recovery image for both x86 and x64 system types, however.

To install DaRT 8

1. Run MSDaRT80.msi from the folder into which you downloaded DaRT.
2. Complete each page of the Microsoft DaRT 8.0 Setup Wizard:

Page	Steps
Welcome to the Microsoft DaRT 8.0 Setup Wizard	Click Next .
End-User License Agreement	Review the license agreement, and click I Agree to accept the license terms.
Microsoft Update	Click Use Microsoft Update when I check for updates , and click Next .
Select Installation Folder	Click Next to install DaRT in the default installation location.
Setup Options	Click Next to install DaRT with all of its features.
Ready to Install	Click Install to begin the installation of DaRT.
Installing Microsoft DaRT 8.0	Monitor installation progress.
Completing the Microsoft DaRT 8.0 Setup Wizard	Click Finish to close the Microsoft DaRT 8.0 Setup Wizard.

Creating DaRT Recovery Images

The DaRT recovery image is a boot image that you can use to start a PC while leaving the installed Windows operating system offline. It provides the variety of recovery tools (Table 3).

Because of skill set limitations or security requirements, you might want to create multiple DaRT recovery images that include different sets of recovery tools. For example, you can build a recovery image for local use that includes tools for restoring lost files and removing malware but disable tools like Locksmith, which allows users to reset local passwords. In any case, the Help desk will always have full access to the recovery tools when using Remote Connection.

Table 3— DaRT Recovery Tools

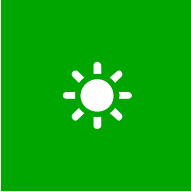
Tool	Description
Computer Management	Troubleshoot a problem PC by using this collection of Windows administrative tools.
Crash Analyzer	Quickly determine the cause of an issue by analyzing the memory dump file.
Defender	Detect malware and unwanted software and alert you to security risks.
Disk Commander	Recover and repair disk partitions or values.
Disk Wipe	Erase all data from a disk or volume.
Explorer	Browse the computer's file system and network shares.
File Restore	Restore deleted files.

File Search	Search the computer for files.
Hotfix Uninstall	Remove hotfixes or service packs from the Windows operating system.
Locksmith	Set the password for any local account.
Registry Editor	Make registry edits that could help repair a system that will not boot.
Sfc Scan	Repair system files that are corrupted or missing.
Solution Wizard	Helps you determine which tool to use when you are not familiar with the tools in DaRT.
TCP Config	Manually configure TCP/IP.

To create a DaRT recovery image


1. On the Start screen, type **DaRT**, and click **DaRT Recovery Image**.
2. Complete each page of the DaRT Recovery Image Wizard:

Page	Steps
Welcome	Click Next .

Page	Steps
Windows 8 Media	<ol style="list-style-type: none">1. Do one of the following:<ol style="list-style-type: none">a. If you are creating a recovery image for x64 system types, click Create x64 (64-bit) DaRT image.b. If you are creating a recovery image for x86 system types, click Create x86 (32-bit) DaRT image.2. In the Specify the root path of the Windows 8 type install media box, type the path of the Windows 8 installation files matching the system type of the recovery image that you are creating.3. Click Next.
Tools	<p>Deselect any of the tools that you do not want to make available to the local user, and click Next. All of the tools will be available by using Remote Connection.</p> <div></div> <p>The fastest way to disable all of the DaRT tools is to deselect the check box in the Name column heading.</p>

Page	Steps
Remote Connections	<p>Optionally do the following to enable Remote Connection, and click Next:</p> <ol style="list-style-type: none"><li>1. Select the Allow remote connections check box.<li>2. To use a specific port number for Remote Connection, click Specify the port number and type a port number.<li>3. In the Remote connection welcome message box, type a brief welcome message that end users will see prior to allowing the connection.<li>4. Click Next.
Advanced Options	<ol style="list-style-type: none"><li>1. On the Drivers tab, do any of the following:<ol style="list-style-type: none"><li>a. Click Add to include device drivers in the recovery image that Windows 8 does not include in the box.<li>b. In the Inf files list, select previously added device drivers that you want to remove from the image, and click Remove.<li>2. On the WinPE tab, select the optional Windows PE components that you want to include in the recovery image.

Page	Steps
Create Image	<ol style="list-style-type: none"><li>1. In the Output folder box, type the path in which you want the wizard to create the output folder.<li>2. In the Image Name box, type a name for the image or accept the default, DaRT8. The wizard creates a subfolder in the output path by this name.<li>3. Optionally, do any of the following:<ul style="list-style-type: none"><li>• To prevent the wizard from creating a WIM file, deselect the Create WIM check box.<li>• To prevent the wizard from creating an ISO file, deselect the Create ISO check box.<li>• To prevent the wizard from generating a Windows PowerShell script that recreates the image using the same settings, deselect the Create PowerShell script check box.<li>4. Do one of the following:<ul style="list-style-type: none"><li>• To modify files in the recovery image before creating the image files, select the Edit image check box, and click Prepare.<li>• To create the recovery image without modifying files, click Create.

Page	Steps
Edit Image	<p>Click Open in Windows Explorer, edit the recovery image as necessary, and click Create.</p> <div></div> <p>You see this page only if you selected the Edit image check box on the Create Image page.</p>
Generate Files	After the wizard creates the recovery image, click Next .
Finish	<ol style="list-style-type: none"><li>1. To optionally create removable media containing the recovery image, select the disc or USB drive in the Select a CD, DVD, or USB drive list, and click Create Bootable Media.<li>2. Do one of the following:<ul style="list-style-type: none"><li>• Click Restart to create another recovery image.<li>• Click Close to close the DaRT Recovery Image Wizard.

Choosing a Deployment Method

DaRT supports three main deployment methods:

- Removable discs and USB media
- Installation to the local hard drive
- Delivery as a network service

Consider and match each deployment method with your available infrastructure components and support staff. Deploying the DaRT recovery image by using removable media is the best choice for organizations with very little infrastructure. Installing the recovery image to the local hard drive helps ensure that it is always available.

Organizations using Active Directory Domain Services (AD DS) will find that deploying recovery images as a network service by using Windows DS is the best solution. Recovery images are always available to any connected PC. You can deploy multiple images from Windows DS and maintain them all in one place.

Table 4 summarizes the benefits and limitations of each deployment method. The remainder of this white paper provides step-by-step instructions for using each deployment method.

Table 4—Choosing a Deployment Method

Method	Benefits	Considerations
<p>Removable Media</p> <p>Recovery image written to discs or USB drives that enable support to carry recovery tools to desktops</p>	<ul style="list-style-type: none"> • Built-in tool for burning recovery image to CD or USB drive. • Enables transition to other deployment options while still providing recovery tools to support staff 	<ul style="list-style-type: none"> • Creation and maintenance of multiple discs and USB drives for each system type (x86 and x64) and unique configurations for different support staff. • Requires that support staff visit local unstable machine.

Method	Benefits	Considerations
	<p>immediately.</p> <ul style="list-style-type: none"> • Create multiple recovery images with different tools for specific support levels. 	
<p>Local Hard Disk</p> <p>Recovery installed on local hard drive manually or by using electronic software distribution systems like Configuration Manager.</p>	<ul style="list-style-type: none"> • Always available because the recovery image is pre-staged on the PC. • Centralized Help desk staff provide repairs with remote connectivity. • Centralized management and deployment of the recovery image. • Eliminate double recovery key request on PCs protected by Windows BitLocker Drive Encryption. 	<ul style="list-style-type: none"> • Local storage requirement. • No update procedure; requires disabling and replacing the recovery image. • Recommend dedicated un-encrypted partition for recovery image placement to reduce risk of failed boot partition. • Deployment after BitLocker is enabled requires additional consideration.
<p>Network Service</p> <p>Recovery image hosted on network boot server like Windows DS that allows users or support staff to stream it to PCs on demand.</p>	<ul style="list-style-type: none"> • Available to all PCs with access to the network boot server. • Recovery images hosted on central server, enabling centralized updates. • Centralized Help desk 	<ul style="list-style-type: none"> • Securing Windows DS infrastructure to ensure that regular users can start only the DaRT recovery image and not the full operating system imaging process. • Requires network connectivity at runtime, and the recovery image has to be

Method	Benefits	Considerations
	<p>staff provide repairs with remote connectivity.</p> <ul style="list-style-type: none">• No local storage requirement on clients.• Create multiple recovery images with different tools for specific support levels.	<p>brought across the network.</p>

Deploying DaRT Recovery Images

The following sections provide the basis for deploying DaRT recovery images:

- Removable Media (Discs and USB drives)
- Manual Installation on Local Hard Drives
- Configuration Manager Deployment to New PCs
- Configuration Manager Deployment to Existing PCs
- MDT 2012 Deployment to New PCs
- Delivery on Demand via Windows Deployment Services



Read the section titled “Manual Installation on Local Hard Drives” before moving on to the sections that describe deployment by using Configuration Manager. Reading the sections in this order will help improve your understanding of the process.

Removable Media (Discs and USB drives)

Applying recovery images to removable media allows Help desk engineers to carry them around to PCs and use them when needed. Although DaRT 7 provided the ability to burn the DaRT recovery image to a disc (CD or DVD), you had to use an external tool to create a bootable USB drive containing the recovery image. The Windows 7 USB/DVD Download Tool is an example of one such tool.

DaRT 8 now offers native support in the DaRT Recovery Image Wizard for creating USB media in addition to discs. After creating the boot images, you can choose a recordable CD, DVD, or USB drive and then click **Create Bootable Media** to write the image to it—without using an external image burner, the Windows 7 USB/DVD Download Tool, or another tool. For more information

about creating bootable media by using the wizard, see the section titled “Creating DaRT Recovery Images.”

Manual Installation on Local Hard Drives

This section describes how to install DaRT recovery images to test systems prior to building an automated deployment option. This allows refinement of the steps provided for an organization’s specific hardware and software configurations before moving on to automating the process by using Configuration Manager or MDT 2012.



In previous versions of DaRT, you had to extract the boot.wim file from the ISO image. DaRT 8 generates the boot.wim file by default now, and you find it in the output folder that you specified on the Create Image page of the DaRT Recovery Image Wizard. To see step-by-step instructions for generating the boot.wim file by using the wizard, see the section titled “Creating DaRT Recovery Images.”

DaRT recovery images include tools to troubleshoot and repair partition and file system corruption. However, if you install them on the same partition as the Windows operating system, the tools will likely be unavailable if you encounter these issues, because any corruption that would prevent the Windows operating system from starting will probably prevent the recovery image from starting.

To counter this scenario, deploy the DaRT recovery image to a dedicated recovery partition on the PC. This partition should be minimum 500MB in size, and you can hide it to prevent the use of the partition for anything but DaRT. (Hiding the partition prevents users from storing files on it.) Creating a separate partition will also eliminate the need to provide the BitLocker recovery key twice when using DaRT and separate the recovery image from the boot partition that could be the source of instability.

There are four major steps to installing a DaRT recovery image locally:

1. Shrink an existing partition and create a new recovery partition
2. Replace the Windows RE with the DaRT recovery image
3. Hide the new recovery partition
4. Start the DaRT recovery image in Windows 8



For more information about using DiskPart, see [DiskPart Command-Line Options](#) on TechNet.

To shrink an existing partition and create a new recovery partition on the primary disk

1. At an elevated command prompt, type **diskpart** and press **Enter**.
2. In DiskPart, type **list volume** and press **Enter**.

Note the number of the volume you want to shrink.

3. Type **select volume *number***, where ***number*** represents the volume you want to shrink.
4. Type **shrink desired=*amount* minimum=500**, where ***amount*** is the amount by which you want to shrink the volume.

Microsoft recommends that you shrink the volume by a minimum of 500MB. You can optionally recover more disk space if you would like to create a larger recovery partition.

5. Type **list disk** and press **Enter**.

Note the number of the disk onto which you are creating the recovery partition. If you are creating the partition on the primary disk, this will likely be disk 0.

6. Type **select disk *number***, where ***number*** is the number of the disk onto which you are creating the recovery partition, and press **Enter**.

7. Type **create partition primary size=*amount***, where ***amount*** is the amount of disk space that you made available by shrinking the volume previously.
8. Type **format fs=ntfs label="Recovery Partition" quick**, and press **Enter**.
9. Type **assign letter=s**, and press **Enter**.
10. Type **exit** to close DiskPart.

To replace the Windows RE with the DaRT recovery image

1. At an elevated command prompt, type **md S:\Recovery\WindowsRE**, and press **Enter**.
2. Type **copy source\boot.wim S:\Recovery\WindowsRE\winre.wim**, where **source** is the path containing the boot.wim file that the DaRT Recovery Image Wizard generated, and press **Enter**.



The file name in S:\Recovery\WindowsRE must be winre.wim.

3. Type **md S:\Recovery\BootMenu**, and press **Enter**.
4. Use a text editor (e.g., Notepad) to create the file AddDiagnosticsToolToBootMenu.xml (Listing 1) in S:\Recovery\BootMenu. Make sure to save the file using UTF-8 encoding by clicking **UTF-8** in the **Encoding** list on the Save As dialog box.

Listing 1—AddDiagnosticsToolToBootMenu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<!-- AddDiagnosticsToolToBootMenu.xml -->
<BootShell>
  <WinRETool locale="en-us">
    <Name>Microsoft Diagnostics and Recovery Toolset</Name>
    <Description>Launch various DaRT recovery tools</Description>
  </WinRETool>
</BootShell>
```

5. Type **reagentc /disable**, and press **Enter**.
6. Type **reagentc /setreimage /path S:\Recovery\WindowsRE /target C:\Windows**, and press **Enter**.
7. Type **reagentc /setbootshellink /configfile S:\Recovery\BootMenu\AddDiagnosticsToolToBootMenu.xml**, and press **Enter**.
8. Type **reagentc /enable**, and press **Enter**.

To hide the recovery partition (drive S:)

1. At an elevated command prompt, type **diskpart** and press **Enter**.
2. In DiskPart, type **list volume** and press **Enter**.
Note the number of the recovery partition.
3. Type **select volume *number***, where *number* represents the recover partition.
4. Type **remove**, and press **Enter**.
5. Type **exit** to quit diskPart.

To start the DaRT recovery image in Windows 8

1. On the Start screen, type **boot**, click **Settings**, and click **Advanced startup options**.
2. Under **Advanced startup**, click **Restart now**.
3. On the **Choose an option** screen, click **Troubleshoot**.
4. On the Troubleshoot screen, click **Microsoft Diagnostics and Recovery Toolset**.

Configuration Manager Deployment to New PCs

This section describes how to add a DaRT recovery image to an existing operating system task sequence in System Center 2012 Configuration Manager. This allows you to deliver the recovery image during Windows deployment to new PCs by using steps similar to a manual installation. There are two major steps in this process:

1. Prepare the recovery image package

2. Add installation steps to an existing task sequence

For more information about Configuration Manager, see [System Center Technical Resources](#) on TechNet.

To create a package for the DaRT recovery image

1. Create a folder in the Configuration Manager package source location for the DaRT Recovery Image package (e.g., DaRT_Image).
2. Copy the boot.wim file that the DaRT Recovery Image Wizard created to winre.wim in the DaRT_Image folder in the package source location.

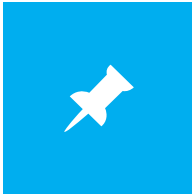


The file name must be winre.wim.

3. Use a text editor (e.g., Notepad) to create DPPost.txt (Listing 2) in the DaRT_Image folder in the package source location. You will have to change *number* in Listing 2.

Listing 2—DPPost.txt

```
REM DPPost.txt
REM removes the drive letter assignment from the
REM recovery partition after deployment
select disk 0
select partition number
remove
exit
```



The script in this section is an example that assumes you will deploy the winre.wim file to a dedicated partition that you create during the operating system task sequence. You will have to change the script for your specific environment.

4. Use a text editor (e.g., Notepad) to create AddDiagnosticsToolToBootMenu.xml (Listing 3) in the DaRT_Image folder in the package source location. Make sure to save the file using UTF-8 encoding by clicking **UTF-8** in the **Encoding** list on the Save As dialog box.

Listing 3—AddDiagnosticsToolToBootMenu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<!-- AddDiagnosticsToolToBootMenu.xml -->
<BootShell>
  <WinRETool locale="en-us">
    <Name>Microsoft Diagnostics and Recovery Toolset</Name>
    <Description>Launch various DaRT recovery tools</Description>
  </WinRETool>
</BootShell>
```

5. In Configuration Manager, create an application package containing the DaRT_Image folder in the package source location; then, distribute the package to your distribution points.

To add installation steps to an existing operating system task sequence

1. In Configuration Manager, edit the existing operating system task sequence.
2. Edit the existing Format and Partition Disk task sequence step to create a dedicated 500MB partition on disk 0, format the partition using NTFS, and assign a drive letter to it (e.g., drive letter S:).
3. Add the task sequence steps that Table 5 describes toward the end of the task sequence after the operating system and other application packages have been installed. To add each, click **Add, General, Run Command Line** in the task sequence editor.

Table 5—Task Sequence Steps

Name	Command	Other
Run REAgentC disable	cmd /c reagentc /disable	
Make directory	cmd /c md S:\Recovery\WindowsRE	
Make directory	cmd /c md S:\Recovery\BootMenu	
Copy winre.wim	cmd /c copy winre.wim S:\Recovery\WindowsRE	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on

		each PC.
Copy boot menu	<pre>cmd /c copy AddDiagnosticsToolToBootMenu.xml S:\Recovery\BootMenu</pre>	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.
Run REAgentC setreimage	<pre>cmd /c reagentc /setreimage /path S:\Recovery\WindowsRE /target C:\Windows</pre>	
Run REAgentC setbootshellink	<pre>cmd /c reagentc /setbootshellink /configfile S:\Recovery\BootMenu\AddDiagnosticsTo olToBootMenu.xml</pre>	
Run	<pre>cmd /c reagentc /enable</pre>	

REAgentC enable		
Hide recovery partition	cmd /c diskpart /s dppost.txt	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.

Configuration Manager Deployment to Existing PCs

This section describes how to install a DaRT recovery image on existing PCs by using a custom task sequence in System Center 2012 Configuration Manager. This allows you to deliver the recovery image to PCs that are already running Windows by using steps similar to a manual installation. This process has two major steps:

1. Prepare the recovery image package
2. Create and deploy a custom task sequence

For more information about Configuration Manager, see [System Center Technical Resources](#) on TechNet.

To create a package for the DaRT recovery image

1. Create a folder in the Configuration Manager package source location for the DaRT Recovery Image package (e.g., DaRT_Image).
2. Copy the boot.wim file that the DaRT Recovery Image Wizard created to winre.wim in the DaRT_Image folder in the package source location.



The file name must be winre.wim.

3. Use a text editor (e.g., Notepad) to create DPPre.txt (Listing 4), DPPreShrink.txt (Listing 5), and DPPost.txt (Listing 6) in the DaRT_Image folder in the package source location. You will have to change *number* in each listing.

Listing 4—DPPre.txt

```
REM DPPre.txt
REM mounts an existing NTFS formatted partition as drive S:
select disk 0
select partition number
assign letter=S
exit
```

Listing 5—DPPreShrink.txt

```
REM DPPreShrink.txt
REM shrinks the Windows partition and
REM creates a new recovery partition
select volume=number
shrink desired=500 minimum=500
select disk 0
create partition primary size=500
format fs=ntfs label="Recovery Partition" quick
assign letter=s
exit
```

Listing 6—DPPost.txt

```
REM DPPost.txt
REM removes the drive letter assignment from the
REM recovery partition after deployment
select disk 0
select partition number
remove
exit
```



You will use either DPPre.txt or DPPreShrink.txt but not both. Use DPPre.txt to mount an existing but dismounted NTFS partition. Use DPPreShrink.txt to shrink an existing partition; and create and format a new partition for the DaRT recovery image.



The scripts in this section are examples that assume you will deploy the winre.wim file to an existing Windows partition or a dedicated partition that you create during the operating system task sequence. You will have to change the scripts for your specific environment.

4. Use a text editor (e.g., Notepad) to create AddDiagnosticsToolToBootMenu.xml (Listing 7) in the DaRT_Image folder in the package source location. Make sure to save the file using UTF-8 encoding by clicking **UTF-8** in the **Encoding** list on the Save As dialog box.

Listing 7—AddDiagnosticsToolToBootMenu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<!-- AddDiagnosticsToolToBootMenu.xml -->
<BootShell>
  <WinRETool locale="en-us">
    <Name>Microsoft Diagnostics and Recovery Toolset</Name>
    <Description>Launch various DaRT recovery tools</Description>
  </WinRETool>
</BootShell>
```

5. In Configuration Manager, create an application package containing the DaRT_Image folder in the package source location; then, distribute the package to your distribution points.

To create a custom task sequence to install the DaRT recovery image

1. In Configuration Manager, create an empty, custom task sequence.
2. Edit the empty, custom task sequence to add the steps that Table 6 describes. The steps must appear in the order that the table lists them. To add each task sequence step, click **Add, General, Run Command Line** in the task sequence editor.
3. Deploy the task sequence to the required collections.

Table 6—Task Sequence Steps

Name	Command	Other
Show recovery partition	One of the following: cmd /c diskpart /s dppre.txt cmd /c diskpart /s dppreshrink.txt	1. Select the Package check box, click Browse , select the DaRT recovery image

		<p>package you created previously, and click OK.</p> <p>2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.</p>
Run REAgentC disable	cmd /c reagentc /disable	
Make directory	cmd /c md S:\Recovery\WindowsRE	
Make directory	cmd /c md S:\Recovery\BootMenu	
Copy winre.wim	cmd /c copy winre.wim S:\Recovery\WindowsRE	<p>1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously,</p>

		<p>and click OK.</p> <p>2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.</p>
<p>Copy boot menu</p>	<pre>cmd /c copy AddDiagnosticsToolToBootMenu.xml S:\Recovery\BootMenu</pre>	<p>1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK.</p> <p>2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator</p>

		r permission on each PC.
Run REAgentC setreimage	cmd /c reagentc /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows	
Run REAgentC setbootshellink	cmd /c reagentc /setbootshellink /configfile S:\Recovery\BootMenu\AddDiagnosticsToOlToBootMenu.xml	
Run REAgentC enable	cmd /c reagentc /enable	
Hide recovery partition	cmd /c diskpart /s dppost.txt	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator



permission on
each PC.

MDT 2012 Deployment to New PCs

This section describes how to deploy a DaRT recovery image by using lite touch installation (LTI) in MDT 2012 Update 1. In previous versions of MDT 2012, you had to add task sequence steps similar to the task sequence steps that you add to existing operating system task sequences in Configuration Manager. However, MDT 2012 Update 1 includes native support for DaRT 8, making it far simpler to deploy recovery images by using MDT 2012.



In System Center 2012 Configuration Manager, MDT 2012 Update 1 task sequences do not support DaRT recovery image deployment. You must use the methods in the section “Configuration Manager Deployment to New PCs” to deploy recovery images by using Configuration Manager.

There are three major steps:

1. Install DaRT 8 on the computer containing the deployment share. You do not have to copy image files to the deployment share’s Tools folder.
2. Configure the deployment share to include DaRT in the boot image.
3. To install the DaRT image locally, set the property `PrepareWinRE` to `Yes`. You can configure properties in MDT 2012 by using `CustomSettings.ini`, a deployment database, or variables in a task sequence. For more information, see the MDT 2012 Update 1 documentation.

After completing these steps, MDT 2012 will install a DaRT recovery image locally during Windows deployment. Deploying a DaRT recovery image by using MDT 2012 offers additional benefits during deployment. First, you can start the DaRT recovery image from the Windows Deployment Wizard. Second, MDT 2012 can use Remote Connection to enable remote control of deployment. For more information, see the MDT 2012 Update 1 documentation.

For more information about MDT 2012, see [Microsoft Deployment Toolkit](#) on TechNet.

To configure the deployment share to include DaRT on the recovery image

1. In Deployment Workbench, right-click the deployment share that you want to configure for DaRT recovery image deployment. Deployment shares are in the **Deployment Shares** folder.
2. Repeat the following steps for the x64 and x86 platforms:
 - a. On the Windows PE tab, click **x64** or **x86** in the **Platform** list.
 - b. On the Features tab, below the **Platform** list, select the **Microsoft Diagnostics and Recovery Toolkit 8 (DaRT 8)** check box.
3. Click **OK** to close the deployment share Properties dialog box.

To configure the PrepareWinRE property in CustomSetings.ini

1. In Deployment Workbench, right-click the deployment share that you want to configure for DaRT recovery image deployment. Deployment shares are in the **Deployment Shares** folder.
2. On the Rules tab, add `PrepareWinRE=YES` to the [Default] section.
3. Click **OK** to close the deployment share Properties dialog box.

Delivery on Demand via Windows Deployment Services

Deploying DaRT recovery images by using Windows DS is a great solution when you want to make multiple recovery images available or you want to simplify updating them later. You can deliver DaRT as a network service rather than installing recovery images later. For more information about Windows DS, see [Windows Deployment Services Overview](#).

To add a DaRT recovery image to Windows DS

1. On the Start screen, type **deployment** and click **Windows Deployment Services**.
2. Right-click **Boot Images**, and click **Add Boot Image**. **Boot Images** is under the domain.
3. Complete the following pages of the Add Image Wizard:

Page	Steps
Image File	<ol style="list-style-type: none">1. In the File location box, type <i>Path</i>\boot.wim, where <i>Path</i> is the path of the folder containing the DaRT recovery image. Alternatively, click Browse to locate the boot.wim file.2. Click Next.
Image Metadata	<ol style="list-style-type: none">1. In the Image name box, type DaRT 8 Recovery Image.2. In the Image description box, type DaRT Recovery Image.3. Click Next.
Summary	Verify the image you are adding, and click Next to add it.
Task Progress	Monitor the operation, and once complete, click Finish .

4. Close Windows DS.

Deploying DaRT with BitLocker

As more organizations adopt BitLocker and perform local installations of DaRT recovery images, the need to have both coexist is becoming more important. But changing disk configurations by installing a recovery image after turning on BitLocker can cause the PC to go into BitLocker recovery mode.

This guide recommends that you deploy DaRT recovery images to the local hard drive as part of the operating system installation and enable BitLocker post deployment. In Configuration Manager and MDT 2012 task sequences, install recovery images prior to the step that enables BitLocker.

Currently, deploying DaRT recovery images to existing PCs with BitLocker doesn't allow for complete automation. The process requires entering the BitLocker recovery key after deployment of the recovery image and having an authorized user suspend and then re-enable BitLocker on the computer.

Updating a Deployed DaRT Recovery Image

There is no update process for a DaRT recovery image that is already installed on a PC. Instead, replace the recovery image on the PC. If you anticipate updating your recovery images often, you might consider deploying them by using Windows DS.

To replace a DaRT recovery image on a PC

1. Unhide the recovery partition by assigning it drive letter S:.
2. At an elevated command prompt, do the following:
 - a. Type **reagentc /disable**, and press **Enter**.
 - b. Type **attrib -r -s -h s:\recovery\windowsre\winre.wim**, and press **Enter**.
 - c. Type **del S:\Recovery\WindowsRE\winre.wim**, and press **Enter**.
 - d. Type **copy path\boot.wim S:\Recovery\WindowsRE\winre.wim**, where **path** is the path of the folder containing the boot.wim file that the DaRT Recovery Image Wizard created, and then press **Enter**.
 - e. Type **reagentc /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows**, and press **Enter**.
 - f. Type **reagentc /enable** and press **Enter**.
3. Hide the recovery partition by removing its drive letter:
 - a. At an elevated command prompt, type **diskpart** and press **Enter**.
 - b. In DiskPart, type **list volume** and press **Enter**.

Note the number of the recovery partition.
 - c. Type **select volume number**, where **number** represents the recover partition.
 - d. Type **remove**, and press **Enter**.
 - e. Type **exit** to quit diskPart.

To create a Configuration Manager task sequence to update a recovery image

1. In Configuration Manager, create and distribute a package as described in the section "Configuration Manager Deployment to Existing PCs."
2. Create a custom task sequence, and edit it to add the steps that Table 7 describes. The steps must appear in the order that the table lists them. To add each task sequence step, click **Add, General, Run Command Line** in the task sequence editor.
3. Deploy the task sequence to the required collections.

Table 7—Task Sequence Steps

Name	Command	Other
Show recovery partition	cmd /c diskpart /s dppre.txt	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.
Run REAgentC disable	cmd /c reagentc /disable	

Unlock winre.wim	<code>attrib -r -s -h S:\Recovery\WindowsRE\winre.wim</code>	
Delete winre.wim	<code>Del S:\Recovery\WindowsRE\winre.wim /q</code>	
Copy winre.wim	<code>cmd /c copy winre.wim S:\Recovery\WindowsRE</code>	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery image package you created previously, and click OK. 2. Select the Run this step as the following account check box, click Set, and type the credentials for an account with local Administrator permission on each PC.
Run REAgentC setreimage	<code>cmd /c reagentc /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows</code>	
Run REAgentC enable	<code>cmd /c reagentc /enable</code>	
Hide recovery partition	<code>cmd /c diskpart /s dppost.txt</code>	<ol style="list-style-type: none"> 1. Select the Package check box, click Browse, select the DaRT recovery



image package you created previously, and click **OK**.

2. Select the **Run this step as the following account** check box, click **Set**, and type the credentials for an account with local Administrator permission on each PC.

Conclusion

DaRT helps IT easily recover PCs that have become unusable, rapidly diagnose probable causes of issues, and quickly repair unbootable or locked-out systems, all without leaving their desks—and much faster than the average time it takes to reimage the machine. DaRT allows administrators to shift desktop repair planning from reactive to proactive, saving time and reducing the challenges associated with troubleshooting and repairing system failures. With a plan in place, the simple image creation process, coupled with an easy to use tool menu, allows organizations to rapidly deploy, use, and benefit from the toolset. To learn more about DaRT, see [Diagnostics and Recovery Toolset](#) on TechNet.