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Microsoft®
Diagnostics and
Recovery Toolset

Microsoft Diagnostics and Recovery Toolset 7 Evaluation Guide

White Paper Descriptor

This document provides administrators with information and steps-by-step technique for deploying Microsoft® Diagnostics and Recovery Toolset in an enterprise environment.

Overview

Many IT departments take a proactive approach to backing up network data, but tend to be reactive in planning for desktop system failures. The most common solution is to reimage the machine, but that can result in loss of user settings, personalization, and potentially data. Microsoft Diagnostics and Recovery Toolset (DaRT) can help you save time and reduce the challenges associated with troubleshooting and repairing system failures.

DaRT consists of a set of tools for IT administrators and support that enable the troubleshooting, repair, and retrieval of important data from client workstations that are experiencing instability or loss of service due to Stop Errors, malware infections, disk corruption, lost files and passwords that would render important data stored on such clients otherwise inaccessible. These tools are built in to a customized DaRT Recovery Image per specifications you prescribe during the Recovery Image Wizard.

The DaRT 7 provides two features in addition to the powerful toolset. The first feature is the ability to deploy DaRT with multiple methods, and the other is to provide remote connectivity to a machine booted into the DaRT Recovery Image. Organizations can utilize removable media with support staff visiting unstable computers, enable users to boot from PXE boot servers, or deploy the DaRT Recovery Image locally to users' computers. Once the unstable machine is booted into the Recovery Image, users can request support staff to remotely connect and provide repairs using the DaRT tools.

This document will explain the following topics:

- Creating the DaRT 7 Recovery Image
    - o Installing DaRT
    - o Installing Debug tools for Windows (optional)
    - o Running the DaRT Recovery Image Wizard
    - o Extracting the boot.wim (if hosting or using centralized deployment of the Recovery Image)
- Deploying DaRT 7 Recovery Images
    - o Removable media (CD and USB)
    - o Deploying to hard disk (manual, Microsoft Deployment Toolkit (MDT), and System Center Configuration Manager (ConfigMgr)
    - o PXE Servers (Windows Deployment Services—WDS)

Intended Audience

This document is intended for IT administrators that are preparing to deploy DaRT into their organization.

Prerequisite Knowledge

This document assumes an understanding of Windows 7 administration, batch scripting and electronic software distribution infrastructures and concepts.

Creating the DaRT 7 Recovery Image

The first step in deploying DaRT is creating a DaRT Recovery Image. The DaRT Recovery Image can be customized to include some or all of the 14 DaRT tools plus include additional tools, drivers, and files for specific organization hardware and troubleshooting requirements.

Install DaRT

Creating the DaRT Recovery Image starts with installing DaRT on an administrative workstation, with the following features:

- **Crash Analyzer:** Tool for troubleshooting Windows Stop Error (BSOD) crash dump files to assist in identifying root cause.
- **DaRT Recovery Image:** Wizard-driven tool for creating the DaRT Recovery Image.
- **DaRT Remote Connection Viewer:** The remote connection viewer will allow the help desk engineer to troubleshoot and recover data from a workstation booted into the DaRT Recovery Image from a remote workstation.

NOTE: It is required to create a DaRT Recovery Image for each platform type (32-bit and 64-bit).

Install Debugging Tools for Windows

Next, install the Debugging Tools for Windows on the workstation where DaRT was installed. The debugging tools must be installed prior to running the DaRT Recovery Image Wizard to enable inclusion in the Recovery Image. If the debugging tools aren't included the target machine would need the debugging tools loaded locally to enable the Crash Analysis feature.

NOTE: Be sure to install the version (32-bit or 64-bit) of the Debugging Tools for Windows that matches the platform of the Recovery Image being created.

More information about the Debugging Tools for Windows, debug symbols and where to obtain them can be found at: http://go.microsoft.com/fwlink/?LinkId=99934.

Run the DaRT Recovery Image Wizard

The Recovery Image is the central component of the DaRT platform. The Recovery Image is a bootable system image file used to boot in parallel on an unstable workstation that will contain any or all of the tools in the table below, depending on the options you select during the wizard.

For reasons of administrative skillset or security, organizations may desire different levels of support be equipped with different sets of DaRT tools. DaRT gives you the ability to decide which tools may be included in a particular DaRT Recovery Image.

For Example: Tier 1 help desk may have a DaRT Recovery Image that will include tools for restoring lost files and removing malware but exclude the Locksmith tool that allows the reset of the local administrator password. Tier 2 help desk may have a DaRT Recovery Image that will include all tools. Evaluate all of the tools and decide which ones are appropriate for different levels of help desk.

The selection of specific tools for specific levels help desk staff is only useful when removable media or PXE server methods of deployment are used. For deployment scenarios where the DaRT Recovery Image will be deployed to the local hard drive, all tools should be included that have been approved for use throughout the organization for all levels of support to ensure they are available. Please review and test the following tools prior to making the final decision for the production DaRT Recovery Image.

Tool	Description
Computer Management	The **Computer Management** utility provides recovery tools to help you: • Disable problematic drivers or services. • View event logs. • Partition and format hard disk drives. • Get information about Autoruns. • Get information about the computer.
Crash Analyzer	The **Crash Analyzer** can be used to diagnose the cause of a system crash and identify the driver that caused the failure.
Disk Commander	The **Disk Commander** can be used to salvage or repair partitions or volumes.
Disk Wipe	The **Disk Wipe** utility can be used to erase disks or volumes.
Explorer	The **Explorer** utility allows you to browse folders and files that are stored on

	various drives.
File Restore	The **File Restore** utility can be used to find and restore deleted files from any supported Windows-based file system.
File Search	The **File Search** utility allows you to restrict the scope of your search by specifying part of the name, search location, estimated size of the file, or the time when the file was modified.
Hotfix Uninstall	**Hotfix Uninstall** can be used to remove Windows hotfixes or service packs from a system that cannot be started.
Locksmith	The **Locksmith** wizard can be used to list the local user accounts and change passwords.
Registry Editor	The **Registry Editor** utility on the **MSDaRT Tools** menu provides access to the local system registry.
Solution Wizard	The **Solution Wizard** provides simple questions to support staff to enable selection of the correct tool based on their answers on the specific problem.
Standalone System Sweeper	The **Standalone System Sweeper** utility helps detect malware or other unwanted software, and alerts you to potential risks.
System File Repair	The **System File Repair** utility helps you check system files and repair any that are corrupt or missing.
TCP/IP Configuration	The **TCP/IP Configuration** utility helps you to display and set a TCP/IP configuration.

During the Recovery Image Wizard, you will be prompted to:

- Provide the location of the Windows operating system (OS) installation media relevant to the OS that is installed on the client you wish to target (*example: Windows 7 32-bit or 64-bit).*
- Select the appropriate tools that will be included in the Recovery Image being created.
- Enabling remote connections to allow support staff to work remotely, specifying a specific port that will be used (optional) for remote connections, and a remote connection welcome message that is displayed to users when the connection is established.
  Note: If no port is specified a range of ports is utilized and will be randomly assigned when the user selects remote connections.
- If Crash Analyzer is an included tool, provide the installation location of the Debugging Tools for Windows or choose to locate the debugging tools on the system being repaired. This requires that all computers running DaRT have the debugging tools installed locally.
- If the Standalone System Sweeper is an included tool, choose whether to download definitions for inclusion in the Recovery Image. If the definitions aren't included they can be downloaded when running the standalone system sweeper at run time.
- Add additional drivers for devices (network cards, storage drivers, etc.) that aren't included with the default Windows Recovery Environment.
- Add additional files to the Recovery Image (OEM tools and additional troubleshooting tools) to ensure support staff has all tools necessary to troubleshoot unstable computers.

Upon completion of the DaRT Recovery Image Wizard, by default, a file called **DaRT70.iso** will be created on the **desktop.** It is recommended to change the name of the ISO file to include the bit version (32-bit or 64-bit) and any specific information (Tier1, Tier2, or other) to eliminate confusion for deployment. Once this file has been saved to the desktop, the next and last phase of the wizard is a built in tool to burn the DaRT70.iso file to a bootable CD. If you do not wish to burn the DaRT70.iso file to a CD, you may cancel the Recovery Image Wizard at this time. Refer to the following sections for alternate deployment and hosting options.

Deploying DaRT 7 Recovery Images

DaRT 7 supports three main deployment methods: removable media, hard disk, and PXE server. Each of these methods should be considered and matched to the organization's available infrastructure components and support staff.

Deploying the DaRT Recovery Image to removable media (CD or USB) is the best choice for organizations without a centralized deployment solution. Support staff can be quickly equipped with removable media and improve support of the user desktops.

Review the following table to match the deployment methods that fit the organization.

Method	Description
Removable Media: DaRT Recovery Image burned or copied to removable media (CD or USB) enabling support to carry DaRT tools to the desktop.	**Benefits:** • Built-in tool for burning Recovery Image to CD. • Enables transition to other deployment options while still providing DaRT tools to support staff immediately. • Create multiple versions of the Recovery Image with different tools for specific support levels. **Considerations:** • Creation and maintenance of multiple CDs / USB drives for each Windows platform (32-bit and 64-bit) and unique configurations for different support staff. • Requires support staff visiting local unstable machine.
Deployment to Hard Disk: DaRT Recovery Image installed on local hard drive: • Manual installation for testing or prior to imaging • Microsoft Deployment Toolkit (MDT) as part of Windows 7 deployment • System Center Configuration Manager (ConfigMgr) Operating	**Benefits:** • Always available as the Recovery Image pre-staged on target client. • Centralized help desk staff provided repairs with remote connectivity. • Dedicated F-key assignment to simplify user support calls. http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx • Centralized management and deployment of the DaRT

System Deployment (OSD) task sequences deploying as part of Windows 7 deployment or deploy to existing Windows 7 machines	Recovery Image to clients with **ConfigMgr** and **MDT.** • Eliminate double Recovery Key request on BitLocker-enabled systems. **Considerations:** • 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.
PXE Server: DaRT Recovery Image hosted on PXE boot server like Windows Deployment Services (WDS) that allows users or support staff to stream the DaRT Recovery Image on machines without locally deployed DaRT Recovery Image.	**Benefits:** • Available to all computers with access to PXE boot server. • DaRT Recovery Image hosted on central server providing centralized updating. • Centralized help desk staff provided repairs with remote connectivity. • No local storage requirement on clients. • Create multiple versions of the Recovery Image with different tools for specific support levels. **Considerations:** • Securing PXE server infrastructure to ensure that regular users can only start DaRT Recovery Image and not full operating system imaging process. • Requires network connectivity at run-time and the Recovery Image has to be brought across the network.

Microsoft Diagnostics and Recovery Toolset 7 Evaluation Guide   9

Deployment Instructions

The following sections are provided as the basis for deploying the DaRT Recovery Image. The script examples provided in each section will likely need to be modified to match the target machines in an organization.

- [Removable Media](#)

- [Manual Deployment to Hard Disk](#)

- [Configuration Manager 2007 Deployment to New Workstations](#)

- [Configuration Manager 2007 Deployment to Existing Workstations](#)

- [MDT Deployment to New Workstations](#)

- [PXE Boot: Windows Deployment Services](#)

It is recommended that you first read the section on Manual Deployment, then jump forward to the specific Configuration Manager 2007, MDT or WDS section that applies to your scenario.

Removable Media

Applying the DaRT70.iso to removable media allows the help desk engineer to hand carry the DaRT Recovery Image to clients when needed. The DaRT Recovery Image Wizard includes the ability to burn the DaRT Recovery image file to a physical CD ROM disk.

Another option for deployment of the DaRT Recovery Image is with a USB flash drive. Several tools are available that allow you to apply an ISO file to a USB drive and make the USB drive bootable. Follow the instructions specific to the tool selected to burn or apply the DaRT Recovery Image ISO file to your chosen removable media.

Manual Deployment to Hard Disk

This section describes the process of deploying the DaRT 7 Recovery Image to the initial test systems prior to building an automated deployment option. This allows refinement of the steps provided for an organization's specific hardware and configurations before moving on to scripting for the Configuration Manager 2007 and/or MDT scenarios.

For each of the **Deploy to hard disk** methods, the **boot.wim** file must first be extracted from the **DaRT70.iso** file in the **sources** directory. The boot.wim file is the actual DaRT Recovery Image itself that the target client will be booted into.

Creating the partition for the recovery image

The DaRT Recovery Image includes tools to troubleshoot and repair partition and file system corruption issues. In order to increase availability of a locally stored DaRT Recovery Image, it is recommended to deploy the DaRT Recovery Image to a dedicated recovery partition on the client workstations. This partition should be minimum 500MB in size and can be kept hidden to prevent use of the partition outside the purposes of DaRT. Creating a separate partition will eliminate having to provide the BitLocker recovery key twice when utilizing DaRT and separates the Recovery Image from the boot partition that could be the source of instability.

The command examples in the following **Manual, ConfigMgr,** and **MDT** scenarios are examples of the DISKPART command to shrink an all-consuming partition to make space available for the recovery partition, and then create and format the recovery partition. These steps are optional and can be removed if you intend to deploy to an existing available formatted NTFS partition.

Manual: Deploy to hard disk deployment process

NOTE: The first 9 steps are used for creating a new recovery partition on a primary disk (DISK 0) that already has a partition consuming the entire disk and then to format the new partition. If you already have an available 500MB formatted partition to use as a recovery partition, **skip to step 10**.

NOTE: If you are using anything other than the first disk on the system being tested, the steps will need to be modified accordingly.

1. At a command prompt enter **DISKPART.**

2. At the **DISKPART** prompt, enter **LIST VOLUME**. Make note of the number of the volume you want to shrink.

3. Enter **SELECT VOLUME <volumenumber>.**

4. Enter **SHRINK DESIRED=<desiredsize>.**

5. Enter **SELECT DISK 0.**

6. Enter **CREATE PARTITION PRIMARY SIZE=500**

7. Enter **LIST VOLUME** and make note of the number of the new 500MB volume you just created.

8. Enter **SELECT VOLUME <newvolumenumber>.**

9. Enter **FORMAT FS=NTFS LABEL="Recovery Partition" QUICK.**

Note: This ends the disk shrinking procedure.

If not continuing from step 9, open the command prompt and start **DISKPART.**

10. Enter **SELECT DISK 0.**

11. Enter **LIST PARTITION** and make note of the new 500MB recovery partition you just created.

12. Enter **SELECT PARTITION <newpartitionnumber>**

13. Enter **ASSIGN LETTER=S** and proceed to the next step. **Do not** close this DISKPART command prompt.

14. Open **Windows Explorer.** Browse to and rename the **boot.wim** file that was extracted from the DaRT70.iso file to **winre.wim**.

    Note: The filename must be **winre.wim.**

15. Create the following path on the **S:** drive (example: **S:\Recovery\WindowsRE**).

16. Copy the **winre.wim** file to the path created on the recovery partition (e*xample: S:\Recovery\WindowsRE\winre.wim).*

17. Open a new **elevated** command prompt to configure Windows to use the DaRT Recovery Image as the Windows Recovery Image using the **REAgentC** command.

18. Enter the following REAgentC commands in the following order:

    a. **REAgentC /disable**

    b. **REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

    Note: The /bootkey switch is optional and the specific scan codes are available at: http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx.

    c. **REAgentC /enable**

    Note: The REAgentC commands must be executed from an elevated command prompt.

19. Close the elevated command prompt.

20. Return to the DISKPART command prompt.

21. Enter **REMOVE.**

22. Enter **EXIT** to exit DISKPART and return to the standard command prompt.

23. Enter **EXIT** to close the command prompt.

    [END OF SECTION]

Microsoft Configuration Manager 2007 Deployment to New Workstations

This section describes the process of adding the deployment of the DaRT 7 Recovery Image as part of an existing Configuration Manager 2007 OSD Task Sequence for delivering operating systems to new workstations. The following steps are broken into two main sections:

- Prepare the DaRT7 Recovery Image ConfigMgr Package

- Incorporate new Task Steps into your existing ConfigMgr OSD Task Sequence

Configuration Manager 2007 based deployment automates the process in the manual deployment steps that are used in testing the DaRT Recovery Image.

Prepare the DaRT7 Recovery Image Configuration Manager 2007 Package

1. Rename the **boot.wim** file that was extracted from the DaRT70.iso file to **winre.wim**.

   Note: The filename must be **winre.wim**

2. Create a folder in the Configuration Manager 2007 Package Source location for the DaRT Recovery Image package. *Example: DaRT Image*

3. Copy **winre.wim** to the **DaRT Image** folder in the package source location.

4. Use a text editor (*i.e., notepad),* to create the following scripts inside the **DaRT Image** folder in the package source location:

   NOTE: The DISKPART script example below is provided as an example and assumes that you will be deploying the winre.wim file to a dedicated partition you create as an OSD Task Step.

   IMPORTANT: It is very likely that the script will need modification to meet your specific environment.

   The DPPost.s script is used to remove the drive letter assignment from the DaRT 7 Recovery Image partition upon completion of deployment.

   a. **DPPost.s**

      SELECT DISK 0
      SELECT PARTITION <recoverypartitionnumber>
      REMOVE
      EXIT

Note: For more information about using the DISKPART command, see the following page at Microsoft TechNet: http://technet.microsoft.com/en-us/library/cc766465(WS.10).aspx

The **DaRT Image** folder in the package source location should now contain the winre.wim and the DPPost.s script files.

Perform the following steps from the Configuration Manager 2007 Console. For more information regarding how to perform the steps listed below, resources are available at the

Configuration Manager 2007 TechCenter on Microsoft TechNet at: http://technet.microsoft.com/en-us/systemcenter/cm/default.aspx

5. Create an application package containing source files specifying the **DaRT Image** folder in the package source location.

6. Copy the package to the relevant Distribution Points.

Incorporate new Task Steps into your existing Configuration Manager OSD Task Sequence

1. Edit the existing Windows 7 deployment OSD Task Sequence and add the following task steps **in this specific order:**

   a. First, add additional Task Steps before the installation of the operating system to create a dedicated 500MB partition to store the DaRT 7 Recovery Image, then format the partition as NTFS and assign a drive letter (in our example S: is used).

   Next, add the following Task Steps toward the end of your Task Sequence after the operating system has been installed and other application packages have been installed.

   b. Click **Add – General – Run Command Line** and configure the following:

      i. Name: **Run REAgentC disable**

      ii. Command line: **CMD /C REAgentC /disable**

   c. Click **Add – General – Run Command Line** and configure the following:

      i. Name: **Make directory**

      ii. Command line: **CMD /C MD S:\Recovery\WindowsRE**

   d. Click **Add – General – Run Command Line** and configure the following:

      i. Name: **Copy winre.wim**

      ii. Command line: **CMD /C COPY winre.wim S:\Recovery\WindowsRE**

      iii. Check the box next to **Package**, click the **Browse** button, select the **DaRT Image** package and click **OK.**

      iv. Check the box next to **Run this step as the following account,** click the **Set** button, enter administrative credentials.

   e. Click **Add – General – Run Command Line** and configure the following:

      i. Name: **Run REAgentC setreimage**

      ii. Command line: **CMD /C REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

      Note: The /bootkey switch is optional and the specific scan codes are available at: http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx.

   f. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC enable**

    ii. Command line: **CMD /C REAgentC /enable**

  g. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run DISKPART Post**

    ii. Command line: **CMD /C DISKPART /s DPPost.s**

    iii. Check the box next to **Package**, click the **Browse** button, select the **DaRT Image** package and click **OK.**

    iv. Check the box next to **Run this step as the following account,** click the **Set** button, enter administrative credentials and click **OK.**

  h. Click **OK.**
    [END OF SECTION]

Configuration Manager 2007 Deployment to Existing Workstations

This section describes the process of deploying the DaRT 7 Recovery Image to existing workstations using Configuration Manager 2007 for delivery. The following steps are broken into two main sections:

- Prepare the DaRT 7 Recovery Image Configuration Manager Package

- Create the Configuration Manager OSD Task Sequence

Configuration Manager based deployment automates the process in the manual deployment steps that are used in testing the DaRT Recovery Image.

Prepare the DaRT7 Recovery Image Configuration Manager 2007 Package

1. Rename the **boot.wim** file that was extracted from the DaRT70.iso file to **winre.wim**.

2. Create a folder in the Configuration Manager Package Source location for the DaRT Recovery Image package. *Example: DaRT Image*

3. Copy **winre.wim** to the **DaRT Image** folder in the package source location.

4. Use a text editor (*i.e., notepad),* to create the following scripts inside the **DaRT Image** folder in the package source location:

   NOTE: The DISKPART script examples below are provided as examples and assume that you will be deploying the winre.wim file to either the Windows System Partition or to a dedicated recovery partition on the primary drive (DISK 0). The scripts will size, create, format, and mount the partition as an S: drive and un-mount the recovery partition after the operation is complete.

   IMPORTANT: You will use **either** the **DPPre.s** *OR* **DPPreShrink.s** scripts later in the task sequence but not both.

   Use the **DPPre.s** script example to mount an existing but unmounted NTFS formatted partition.

   Use the **DPShrink.s** script example to shrink an existing partition to allow for the creation of a new partition to host the DaRT7 Recovery Image, then create, format, and mount the partition.

   IMPORTANT: It is very likely that the scripts will need modification to meet your specific environment.

   a. **DPPre.s**

      SELECT DISK 0
      SELECT PARTITION <recoverypartitionnumber>
      ASSIGN LETTER=S
      EXIT

   b. **DPPreShrink.s**

      SELECT VOLUME=<volumenumber>
      SHRINK DESIRED=<desiredsize>

SELECT DISK 0

CREATE PARTITION PRIMARY SIZE=500

SELECT VOLUME=<newvolumenumber>

FORMAT FS=NTFS LABEL="Recovery Partition" QUICK

SELECT DISK 0

SELECT PARTITION <recoverypartitionnumber>

ASSIGN LETTER=S

EXIT

   c. **DPPost.s**

SELECT DISK 0

SELECT PARTITION <recoverypartitionnumber>

REMOVE

EXIT

Note: For more information about using the DISKPART command, see the following page at Microsoft TechNet: http://technet.microsoft.com/en-us/library/cc766465(WS.10).aspx

The **DaRT Image** folder in the package source location should now contain the winre.wim the DPPre.s or DPPreShrink.s script and the DPPost.s script.

Create the Configuration Manager 2007 OSD Task Sequence

Note: The following steps are performed within the Configuration Manager 2007 Console.

For more information regarding how to perform the steps listed below, resources are available at the Configuration Manager TechCenter on Microsoft TechNet at: http://technet.microsoft.com/en-us/systemcenter/cm/default.aspx

5. Create an Application Package containing source files specifying the **DaRT Image** folder in the package source location.

6. Copy the Package to the relevant Distribution Points.

7. Create a Task Sequence for deployment. (Part of Operating System Deployment)

8. Edit the Task Sequence and add the following task steps **in this specific order:**

   a. Click **Add – General – Run Command Line** and configure the following:

      i. Name: **Run DISKPART [*Expand or Shrink*]**

      ii. Command line: **CMD /C DISKPART /s *DPExpand.s [or DPShrink.s]***

      iii. Check the box next to **Package**, click the **Browse** button, select the **DaRT Image** package and click **OK.**

      iv. Check the box next to **Run this step as the following account,** click the **Set** button, enter administrative credentials.

b. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC disable**

    ii. Command line: **CMD /C REAgentC /disable**

c. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Make directory**

    ii. Command line: **CMD /C MD S:\Recovery\WindowsRE**

d. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Copy winre.wim**

    ii. Command line: **CMD /C COPY winre.wim S:\Recovery\WindowsRE**

e. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC setreimage**

    ii. Command line: **CMD /C REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

    Note: The /bootkey switch is optional and the specific scan codes are available at: http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx.

f. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC enable**

    ii. Command line: **CMD /C REAgentC /enable**

g. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run DISKPART Post**

    ii. Command line: **CMD /C DISKPART /s DPPost.s**

    iii. Check the box next to **Package**, click the **Browse** button, select the **DaRT Image** package and click **OK.**

    iv. Check the box next to **Run this step as the following account,** click the **Set** button, enter administrative credentials and click **OK.**

h. Click **OK.**

9. Advertise the Task Sequence to the relevant Collections.
[END OF SECTION]

MDT Deployment to New Workstations

This section describes the process of adding the deploying the DaRT 7 Recovery Image using MDT as part of an existing MDT Task Sequence for delivering operating systems to new workstations. The following steps are broken into two main sections:

- Prepare the DaRT7 Recovery Image MDT applications

- Incorporate new Task Steps into your existing MDT Task Sequence

Note: This section assumes that you are already familiar with general MDT administration. For more information regarding MDT, refer to Microsoft TechNet at: http://technet.microsoft.com/en-us/solutionaccelerators/dd407791

MDT-based deployment automates the process in the manual deployment steps that are used in testing the DaRT Recovery Image.   The following steps will walk you through the deployment of the DaRT 7 Recovery Image with your existing operating system deployment task sequence using MDT:

Prepare the DaRT7 Recovery Image MDT applications

Rename the **boot.wim** file that was extracted from the DaRT70.iso file to **winre.wim**.

>   **Note:** The filename must be **winre.wim**

1. Create a folder on the MDT server to serve as the Deployment Share (*ex: C:\DaRTShare*).

2. Create a folder on the MDT server to serve as the DaRT source folder *(ex:* C:\DaRT Source).

3. Copy the DaRT7 **winre.wim** to the DaRT source folder.

4. Use a text editor (*i.e., notepad)* to create the following scripts inside the DaRT source folder:

   NOTE: The DISKPART script example below is provided as an example and assumes that you will be deploying the winre.wim file to a dedicated partition you create as an OSD Task Step.

   IMPORTANT: It is very likely that the script will need modification to meet your specific environment.

   The DPPost.s script is used to remove the drive letter assignment from the dedicated DaRT7 Recovery Image partition upon completion of deployment.

   a. **DPPost.s**

   > SELECT DISK 0
   > SELECT PARTITION <recoverypartitionnumber>
   > REMOVE
   > EXIT

Note: For more information about using the DISKPART command, see the following page at Microsoft TechNet: http://technet.microsoft.com/en-us/library/cc766465(WS.10).aspx

The **DaRT Source** folder should now contain the winre.wim and DPPost.s script files.

Note: The following steps are performed within the MDT Deployment Workbench Console.

5. Create a Deployment Share for DaRT by selecting the folder created earlier (*ex: C:\DaRTShare).*

    a. Uncheck **Ask if an image should be captured.**

6. Right-click the DaRTShare Deployment Share and right-click **Applications** and select **New Application**.

    a. Select **Application with source files.**

    b. Name the application **CopyDaRT**

    c. Browse to and select the DaRT Source folder.

    d. For the command line, enter **CMD /C COPY winre.wim S:\Recovery\WindowsRE**

7. Right-click **Applications** and select **New Application**.

    a. Select **Application with source files.**

    b. Name the application **DPPost**

    c. Browse to and select the DaRT Source folder.

    d. For the command line, enter **CMD /C DISKPART /s DPPost.s**

Incorporate new Task Sequence Steps into your existing MDT Task Sequence

1. Edit the existing MDT Task Sequence and add the following task steps **in this specific order:**

    a. First, add additional Task Steps before the installation of the operating system to create a dedicated 500MB partition to store the DaRT 7 Recovery Image, then format the partition as NTFS and assign it a drive letter (in our example S: is used).

       Next, add the following Task Steps toward the end of your Task Sequence after the operating system has been installed and other application packages have been installed.

2. Add the following task steps **in this specific order:**

    a. Click **Add – General – Run Command Line** and configure the following:

       i. Name: **Run REAgentC disable**

       ii. Command line: **CMD /C REAgentC /disable**

    b. Click **Add – General – Run Command Line** and configure the following:

       i. Name: **Make directory**

       ii. Command line: **CMD /C MD S:\Recovery\WindowsRE**

c. Click **Add – General – Install Application** task step.

    i. Select **Install a single application.**

    ii. Click **Browse** and select the **CopyDaRT** package.

d. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC setreimage**

    ii. Command line: **CMD /C REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

Note: The /bootkey switch is optional and the specific scan codes are available at: http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx.

e. Click **Add – General – Run Command Line** and configure the following:

    i. Name: **Run REAgentC enable**

    ii. Command line: **CMD /C REAgentC /enable**

f. Click **Add – General – Install Application** task step.

    i. Select **Install a single application.**

    ii. Click **Browse** and select the **DPPost** package.

g. Click **OK.**
   [END OF SECTION]

PXE Boot: Windows Deployment Service

Note: This section assumes that you already have an existing Windows Deployment Service (WDS) server configured to work via PXE and that you are familiar with general WDS administration.

For more information regarding WDS set up and administration, refer to Microsoft TechNet at: http://technet.microsoft.com/en-us/library/cc771670(WS.10).aspx

1. Copy the **boot.wim** file that was extracted from the DaRT70.iso file to a folder on the WDS server *(ex: D:\DaRTImage).*
2. Open the **Windows Deployment Services** console.
3. In the left-hand pane, expand **Servers,** and expand your WDS server.
4. Right-click **Boot Images** and select **Add boot image**.
5. Browse to and select the **D:\DaRTImage\boot.wim** file.
6. Name the image (*ex: DaRT Recovery Image).*

BitLocker and DaRT Deployment

As more organizations adopt BitLocker and DaRT Recovery Image support deployment to the local hard drive, the need to have both coexist is becoming more important. The deployment guidance in this document provides the recommended process for deploying DaRT to systems without BitLocker enabled prior to deployment of the recovery image. This is due to restrictions that are present when changing the disk configurations on a BitLocker-enabled drive.

It is recommended to deploy DaRT to the local hard disk as part of the operating system installation and enable BitLocker post deployment. This is common for organizations that are creating their build process and deployment for Windows 7.

Currently, deploying the DaRT Recovery Image to existing Windows 7 computers 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 in place on a client. Instead, the DaRT Recovery Image is replaced on the client.

The process to replace the DaRT Recovery Image follows:

1. Follow the process in the Creating the DaRT v7 Recovery Image section as before to create the new DaRT Recovery Image.

2. Extract the new boot.wim file from the DaRT70.iso file.

3. Rename the new boot.wim file to winre.wim

4. Mount the recovery partition as a drive (example: S:\)

5. Execute the following command (note: requires elevation):

    a. **REAgentC /disable**

6. Use the ATTRIB command to unprotect the old winre.wim.

    a. *Example: ATTRIB –r –s –h S:\Recovery\WindowsRE\winre.wim*

7. Delete the existing winre.wim file from S:\Recovery\WindowsRE.

8. Copy the new winre.wim file to S:\Recovery\WindowsRE.

9. Enter the following commands in order (note: requires elevation):

    a. **REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

       Note: The /bootkey switch is optional and the specific scan codes are available at: http://technet.microsoft.com/en-us/library/dd799242(WS.10).aspx.

    b. **REAgentC /enable**

       Note: The REAgentC commands must be executed from an elevated command prompt.

10. Un-mount the recovery partition.

To automate the replacement of the DaRT image, modify the example scripts and task sequences provided in the previous sections to follow this process.

Example task sequence steps and scripts:

1. Task Step 1: DISKPART /s **DPPre.s**

    DPPre.s

       SELECT DISK 0

```
        SELECT PARTITION <recoverypartitionnumber>
        ASSIGN LETTER=S
        EXIT
```

2. Task Step 2: Execute **REAgentC /disable**

3. Task Step 3: Execute **ATTRIB –r –s –h S:\Recovery\WindowsRE\winre.wim**

4. Task Step 4: Delete **S:\Recovery\WindowsRE\winre.wim**

5. Task Step 5: Copy **new winre.wim** to **S:\Recovery\WindowsRE**

6. Task Step 6: Execute **REAgentC /setreimage /path S:\Recovery\WindowsRE\ /target C:\Windows /bootkey 3b00**

7. Task Step 7: Execute **REAgentC /enable**

8. Task Step 8: Run DISKPART /s **DPPost.s**

   DPPost.s

```
        SELECT DISK 0
        SELECT PARTITION <recoverypartitionnumber>
        REMOVE
        EXIT
```

[End of Section]

Conclusion

DaRT 7 supports different deployment scenarios that enable organizations to ensure that they can take a proactive approach to repairing unstable PCs instead of re-imaging. The use of removable media is the starting point for testing and to begin realizing the benefits today. After testing the different local hard drive delivery methods as well as PXE server options, organizations can implement a complete strategy that may be a combination of the deployment methods to achieve success.