

Intel® vPro™ Technology Use Case Reference Design

Using Microsoft* Diagnostic and Recovery Tools Remotely with
Intel® vPro™ Technology

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1 Preface

Microsoft's bootable Diagnostic and Recovery Tools (MSDaRT) provide the ability to troubleshoot and recover a system that will not boot into Windows. With Intel® vPro™ technology, it is possible to use MSDaRT remotely, enabling a Help Desk to repair system's that would otherwise require a desk side visit. This use case reference design (UCRD) steps the reader through building MSDaRT for remote use and booting MSDaRT remotely.

1.1 Document Scope

This document covers the basic process of building MSDaRT 6.5. MSDaRT 6.5 is meant for systems with Windows* 7. For systems without KVM Remote Control, integrating basic services into MSDaRT to aide in remote use is also covered. Lastly, it covers remotely booting MSDaRT. This document does not cover detailed use of MSDaRT. Older MSDaRT versions are also not covered. For that information refer to the links in the Related Documentation section below.

1.2 Intended Audience

MSDaRT is a tool that aides in remote diagnostics and repair using Intel vPro technology. As such this document is intended for Information Technology (IT) professionals who desire to learn more about and deploy this type of use case.

1.3 Related Documentation and Software

The download package for this and other Use Case Reference Designs, including the Remote Drive Share software and other supporting files referenced in this document, can be found at the following link:

<http://communities.intel.com/docs/DOC-4080>

Technet – "MSDaRT"

<http://technet.microsoft.com/en-us/library/ee460914.aspx>

How to download MDOP (MSDaRT is part of MDOP) for testing

<http://blogs.technet.com/b/virtualworld/archive/2009/02/26/how-to-download-the-mdop-2008-r2-app-v-4-5-from-msdn.aspx>

How to purchase MDOP (MSDaRT is part of MDOP)

<http://www.microsoft.com/windows/enterprise/how-to-buy.aspx>

UCRDs covering Help Desk Consoles:

RAdmin* (SOL/IDEr): <http://communities.intel.com/docs/DOC-4309>

RealVNC VNC* Viewer Plus (KVM/IDEr): <http://communities.intel.com/docs/DOC-4910>

Remote ISO Launcher (IDEr): <http://communities.intel.com/docs/DOC-5943>

UCRDs covering faster remote booting:

2 stage boot: <http://communities.intel.com/docs/DOC-5552>

Trigger a Recovery OS: <http://communities.intel.com/docs/DOC-5616>

2 Introduction

Microsoft's Desktop Optimization Pack (MDOP) includes a Diagnostic and Recovery Tool set known as MSDaRT. Part of MSDaRT is ERD Commander, a bootable WinPE based boot disk that can be used to troubleshoot and repair systems that will otherwise not boot into Windows from the primary installation. Note that the term "MSDaRT" is often used to refer to ERD Commander. The rest of this document will use the terms MSDaRT and ERD Commander interchangeably.

When coupled with Intel vPro technology's IDE Redirection and KVM Remote Control features, MSDaRT can be used remotely from a help desk. This removes the need for a desk side visit in order to make use of MSDaRT.

This document covers ERD Commander version 6.5, which is paired with Windows 7 and Windows 2008 R2.

It should be noted that MSDaRT is not free; it requires volume licensing from Microsoft. For information on purchasing the MDOP see the following website: <http://www.microsoft.com/windows/enterprise/how-to-buy.aspx>.

For testing purposes, MDOP may be downloaded using an MSDN or MS Tech net account, MSDaRT is included. Detailed steps are here: <http://blogs.technet.com/b/virtualworld/archive/2009/02/26/how-to-download-the-mdop-2008-r2-app-v-4-5-from-msdn.aspx>

If MSDaRT is not an option for you, one alternative is to build your own WinPE. The following UCRD outlines the basic steps: <http://communities.intel.com/docs/DOC-5095>.

Check the UCRD landing page (<http://communities.intel.com/docs/DOC-4080>) for more UCRDs on enhancing WinPE. Also, <http://reboot.pro/> is a good source for information on building and enhancing WinPE.

Another Alternative is WinRE, Microsoft's Recovery Environment for Windows Vista and Windows 7.

This document covers building MSDaRT. There are two options. The first is to use MSDaRT with the default build, adding only LAN drivers. In this configuration, MSDaRT may be used remotely with any system that has Intel AMT 6 or higher and has KVM Remote Control configured. The second option is to make modifications to MSDaRT to allow it to be used remotely from any system with Intel AMT 2 or greater. Sections 3.1 and 3.2 cover these methods, respectively.

This document also covers the basics of remote boot and remote access to MSDaRT.

For detailed info on features and use of MSDaRT, please see:
<http://www.microsoft.com/windows/enterprise/products/mdop/dart.aspx> and
<http://technet.microsoft.com/en-us/library/ee460914.aspx>

2.1 Requirements

Windows 7 Install DVD	
Technician PC – used to build MSDaRT	Any PC with Microsoft* Windows 7.
Console PC	Any PC with Microsoft* Windows XP or later. Note: Can be the same as the Technician PC.
Managed Client with Intel vPro technology	<ul style="list-style-type: none"> • Intel AMT 2.0 or higher. • For KVM Remote Control - Intel AMT 6.0 or higher with Intel Integrated Graphics <p>Note: Document example uses an Dell E6410 based system as an example.</p>

2.2 Process Overview

2.2.1 MSDaRT with KVM Remote Control

This process involves building a plain MSDaRT image. These steps will help find the proper LAN drivers. Otherwise, there is nothing special beyond other documents that cover this process. This is the nice part about using MSDaRT with KVM Remote Control. Everything works as is. From the technician PC:

1. Download/Install Support Tools
 - WinDBG
 - 7Zip
 - LAN Drivers
2. Install ERD Commander
3. Use ERD Commander wizard
 - Add drivers

2.2.2 MSDaRT without KVM Remote Control

This process involves adding a VNC Server into MSDaRT. For this server to start automatically, the Windows Automated Install Kit (WAIK) must be used to integrate drivers, and the startup process must be adapted.

1. Disable Virus Scan and Intrusion Detection System (IDS) during this process.
This may not be required, but is recommended as some virus scanners and IDSs will block the VNC server from being installed.
2. Download/Install Support Tools
 - WAIK
 - WinDBG
 - 7Zip
 - LAN Drivers
 - VNC Server
3. Install ERD Commander
4. Use ERD Commander wizard
 - Add drivers with WAIK
 - Add VNC Server
 - Modify startup scripts

3 Build MSDaRT

3.1 For Use with KVM Remote Control

The steps below describe in detail what was outlined above in 2.2.1. Before beginning, you must decide what architecture (32 bit or 64 bit) will be used for MSDaRT. MSDaRT should match the architecture of the OS installed on the Managed Client with Intel vPro technology. As such, it may make sense to follow these steps twice so that a 32 bit and 64 bit MSDaRT are available for either case.



NOTE

The Technician PC's architecture must match your choice here. In other words, if you want to build a 32 bit MSDaRT your technician PC must have 32 bit Windows 7 installed.

3.1.1 Obtain the Files

From the Technician PC, download and prepare the necessary files as described in the following subsections.

3.1.1.1 Microsoft Desktop Optimization Pack

It should be noted that MSDaRT is not free; it requires volume licensing from Microsoft. For information on purchasing the MDOP see the following website: <http://www.microsoft.com/windows/enterprise/how-to-buy.aspx>.

For testing purposes, MDOP may be downloaded using an MSDN or MS Tech net account, MSDaRT is included. Detailed steps are here: <http://blogs.technet.com/b/virtualworld/archive/2009/02/26/how-to-download-the-mdop-2008-r2-app-v-4-5-from-msdn.aspx>

This will result in a .iso file. This document uses:
en_desktop_optimization_pack_2010_x86_x64_dvd_x16-58156.iso

3.1.1.2 7Zip

7Zip is a free file archive utility. It will be used to extract the LAN drivers from the installer. Get the latest 7Zip from here: <http://www.7-zip.org/>

This document uses 7z920.msi. Note: be sure the architecture matches that of the Technician PC.

3.1.1.3 LAN Drivers for Windows* 7

LAN Drivers for Intel vPro technology based systems are backward compatible, thus you only need to install the latest driver for the latest version of Intel vPro technology in your WinPE image. As such, it is recommended that you use the latest driver version from the newest Intel vPro technology capable Intel® Desktop Board. At this time, Intel® Desktop Board DQ67SW is the recommended board in this document. Follow the link below and search for DQ67SW.

<http://downloadcenter.intel.com/>

Note that when newer Intel vPro technology based systems come out (i.e., Intel AMT 8.0), you will want to revise your image with newer drivers to support the newer Intel vPro technology.

Follow the steps below:

1. Download the latest Intel LAN drivers for Win7 and the latest Executive Series Intel Desktop Board (e.g., DQ67SW) from the link above. Be sure to choose the proper architecture for the Managed Client with vPro technology. This document uses ProWIN32.exe.
2. Install 7zip downloaded earlier.
3. Right click on the downloaded file (e.g., Prowin32.exe) and choose 7Zip -> Extract....
4. Save the file as **c:\ProWin32** or **c:\prowinx64** depending on your architecture.
5. When extraction completes, do one of the following:
 - For 32bit: copy c:\ProWin32\Pro1000\Win32\NDIS62*. * to c:\drivers\LAN\32
 - For 64bit: copy c:\ProWinx64\Pro1000\Winx64\NDIS62*. * to c:\drivers\LAN\64

3.1.1.4 MS Debugging Tools

MS Debugging tools are part of the MS Windows SDK:

<http://www.microsoft.com/downloads/en/details.aspx?FamilyID=c17ba869-9671-4330-a63e-1fd44e0e2505&displaylang=en>

1. Download **WinSDK_web.exe**.
2. When the download completes, execute the file.
3. If prompted that some components are not installed, click **OK** to continue.
4. Click **Next**.
5. Agree to the license and click **Next**.
6. On the **File Location** screen click **Next**.
7. Deselect all options except **Debugging tools for Windows** and click **Next**.
8. Click **Next**.
9. Deselect "View the Windows SDK Release Notes" and click **Finish**.

3.1.2 Install MSDaRT

1. Burn the MDOP ISO file to a CD or Mount this .iso file (we suggest using Virtual CloneDrive for mounting .iso files).
2. Insert the CD into the Technician PC.
3. Double-click <cd drive>:\launcher\launcher.hta.
4. Click the **Diagnostics and Recovery Toolset** icon.
5. Click **Install MSDaRT 6.5 <arch>**. Select the architecture for use on the Managed Client with Intel vPro Technology.
6. Follow the install Wizard, selecting defaults and/or "Typical" options.
7. Close the launcher.

3.1.3 Build MSDaRT boot Media (ERD Commander)

1. Open ERD Commander Boot Media Wizard.
2. Click **Next**.
3. Insert your Win7 DVD. Be sure the architecture matches your target Managed client with Intel vPro technology.
4. Click **Browse** and locate the DVD.
5. Click **Next**.
6. Click **Next**.
7. In the Tool Selection window, make your choices. We recommend all tools. Click **Next**.
8. In the Crash Analyzer Wizard, it should detect your Windows Debugging tools install. Verify the path is correct. For this doc, this is "c:\Program Files\Debugging Tools for Windows (x86)". Click **Next**.
9. Check **Yes** to download the latest definitions. When download is complete, click **Next**.
10. Additional Drivers:
 - a) Click **Add Device**.
 - b) Browse to c:\drivers\LAN\32 or c:\drivers\LAN\64 depending on your desired architecture.
 - c) For 32 bit, select e1c6232.inf file. For 64 bit, select e1c62x64.inf. Click Open.
 - d) Repeat steps b and c selecting: 32bit= e1k6232.inf file, 64bit = e1k62x64.inf.
 - e) Repeat steps b and c for others drivers you want. Note: in most cases, only LAN drivers are required as MSDaRT has built in support for IDE, AHCI and most other devices.
 - f) Click **Next**.
11. If you'd like to add files to the boot image, do so in the Additional Files section. Note: it is advised to keep the boot image as small as possible in order to speed remote booting. Only add files you need. No other files are required for MSDaRT to function. Click **Next**.
12. In the Create Startup Image screen, select a location to save the new MSDaRT.iso file. This document places it on the desktop. Click **Next**.

13. In the Burn to Recovery CD screen, deselect "Burn the image..." and click **Next**.
14. Click **Finish**.

Congratulations, you have built a MSDaRT image. Now, you are ready to remote boot it. Proceed to section 4, Perform IDER Boot and Basic Remote Tasks, on page 23.

3.2 For Systems Without KVM Remote Control

The steps below describe in detail what was outlined in section 2.2. Before beginning, decide what architecture (32 bit or 64 bit) will be used for MSDaRT. MSDaRT should match the architecture of the OS installed on the Managed Client with Intel vPro technology. As such, it may make sense to follow these steps twice so that a 32 bit and 64 bit MSDaRT are available for either case.



NOTE

The Technician PC's architecture and the Windows 7 install media must match your choice here. In other words, if you want to build a 32 bit MSDaRT your technician PC must have 32 bit Windows 7 installed and a 32 bit Windows 7 install media must be used.

3.2.1 Obtain the Files

From the Technician PC, download and prepare the necessary files as described in the following subsections.

3.2.1.1 Microsoft Desktop Optimization Pack

It should be noted that MSDaRT is not free; it requires volume licensing from Microsoft. For information on purchasing the MDOP:

<http://www.microsoft.com/windows/enterprise/how-to-buy.aspx>.

For testing purposes, MDOP may be downloaded using an MSDN or MS Tech net account, MSDaRT is included. Detailed steps are here:

<http://blogs.technet.com/b/virtualworld/archive/2009/02/26/how-to-download-the-mdop-2008-r2-app-v-4-5-from-msdn.aspx>

This will result in a .iso file. This document uses:

en_desktop_optimization_pack_2010_x86_x64_dvd_x16-58156.iso

3.2.1.2 WAIK for Windows 7

Click the link below to obtain the Windows Automated Installation Kit for Windows 7.

<http://www.microsoft.com/downloads/details.aspx?familyid=696DD665-9F76-4177-A811-39C26D3B3B34&displaylang=en>

This results in an .iso file. Mount it (Virtual CloneDrive is a nice tool for mounting .iso files) or burn it to a CD and insert the CD.

Install the WAIK with default options (select **Windows AIK Setup** from the CD's default GUI menu).

3.2.1.3 7Zip

7Zip is a free file archive utility. It will be used to extract the LAN drivers from the installer. Get the latest 7Zip from here: <http://www.7-zip.org/>

This document uses 7z920.msi. **Note:** be sure the architecture matches that of the Technician PC.

3.2.1.4 LAN Drivers for Win7

LAN Drivers for Intel vPro based systems are backward compatible, thus you only need to install the latest driver for the latest version of Intel vPro technology in your WinPE image. As such, we're recommending that you use the latest driver version from the newest Intel vPro technology capable Intel® Desktop Board. At this time, Intel® Desktop Board DQ67SW is the board recommended in this document. Follow the link below and search for DQ67SW.

<http://downloadcenter.intel.com/>

Note that when newer Intel vPro technology based systems come out (i.e., Intel AMT 8.0), you will want to revise your image with newer drivers to support the newer Intel vPro technology.

Follow the steps below:

1. Download the latest Intel LAN drivers for Win7 and the latest Executive Series Intel Desktop Board (e.g., DQ67SW) from the link above. Be sure to choose the proper architecture for the Managed Client with Intel vPro technology. This document uses ProWIN32.exe.
2. Install 7zip downloaded earlier.
3. Right click on the downloaded file (e.g., Prowin32.exe) and choose **7Zip -> Extract....**
4. Save the file as **c:\ProWin32** or **c:\prowinx64** depending on your architecture.
5. When extraction completes, do one of the following:
 - For 32 bit: copy c:\ProWin32\Pro1000\Win32\NDIS62*. * c:\drivers\LAN\32
 - For 64 bit: copy c:\ProWinx64\Pro1000\Winx64\NDIS62*. * c:\drivers\LAN\64

3.2.1.5 MS Debugging Tools

MS Debugging tools are part of the MS Windows SDK:

<http://www.microsoft.com/downloads/en/details.aspx?FamilyID=c17ba869-9671-4330-a63e-1fd44e0e2505&displaylang=en>

1. Download WinSDK_web.exe.
2. When the download completes, execute the file.
3. If prompted that some components are not installed, click **OK** to continue.
4. Click **Next**.
5. Agree to the license and click **Next**.
6. On the File Location screen, click **Next**.
7. Deselect all options except "Debugging tools for Windows" and click **Next**.
8. Click **Next**.
9. Deselect **View the Windows SDK Release Notes** and click **Finish**.

3.2.1.6 VNC Server and VNC Viewer

Obtain files for VNC server and VNC Viewer

For 32 bit:

1. Create a directory c:\vnc\
2. Download VNC Free Edition for Windows:
<http://realvnc.com/products/free/4.1/index.html>
3. Install RealVNC Viewer & Server – On the **Select additional tasks** screen deselect **Register and configure VNC server...** and **Start the VNC Server in Service-Mode**.
4. Configure RealVNC VNC* Server (**Start -> Programs -> RealVNC -> VNC Server 4 (User-Mode) -> Configure User Mode Settings**).
 - Be sure to set a VNC Password of 8 characters.
 - Unless a local user will be present, do not set "Prompt local User..."
 - Leave everything else default
5. Run **Regedit** as an **administrator**.
6. Goto **[HKEY_CURRENT_USER\Software\RealVNC]**.
7. Right-click and select **Export**.
8. Save as **c:\vnc\settings.reg**.
9. Copy all files from **c:\Program Files\RealVNC\VNC4*.*** to **c:\vnc**
10. Delete **Unins000.*** and **vncviewer.exe** from **c:\vnc**

For 64 bit:

At the time of this writing, RealVNC does not have a free version that will run in a 64 bit WinPE. However, their enterprise version works just fine. The first step is to get a license for it. Contact RealVNC for more information. Once you have a license, follow these steps.

1. Create the following directory **c:\vnc**
2. Download RealVNC Enterprise Edition.
<http://www.realvnc.com/products/enterprise/>.
3. Install RealVNC Enterprise Edition. Choose options to exclude the mirror driver and printer driver. When prompted, cancel the license key entry. All other options may be left default.
4. Upon completion of installation, a VNC Server (Service Mode) dialog will appear. Use it to configure the VNC server as follows:
 - a) Click **Options**.
 - b) Set **When VNC Viewers Connect** to **Do Nothing**.
 - c) Set **Authentication** to **VNC Password**.
 - d) Click **Configure**.
 - e) Set the VNC Password. Be sure it is exactly 8 characters. This will be the password you use when connecting via VNC to your WinPE. Click **OK**.
 - f) Leave everything else default.
 - g) Click **OK**.
5. Close the VNC Server (Service Mode) Window.
6. Copy the following files from **c:\Program Files\RealVNC\VNC4** to **c:\vnc**
 - Logmessages.dll
 - Saslib.dll
 - Vncconfig.exe
 - Winvnc4.exe
 - Wm_hooks.dll
7. Run **Regedit** as an **administrator**.
8. Go to **[HKEY_LOCAL_MACHINE\Software\RealVNC]**.
9. Right-click and select **Export**.
10. Save as **c:\vnc\settings.reg**.

Obtain files for SOL driver

Note: SOL driver allows VNC Server script to notify the remote user after the VNC Server has started. This is recommended, but not required.

1. Download the latest Intel AMT driver for the latest Executive Series Intel Desktop board from <http://downloadcenter.intel.com/>. At the time of this writing, the recommended board is Intel Desktop Board DQ67SW.
2. Right click on the downloaded file (e.g. MEI_AMT_ALLOS_6.1.0.1042_PV.exe) and choose **7Zip -> Extract...**

3. Save the file as **c:\MEI**.
4. Create a folder **c:\drivers\SOL**.
5. Copy **c:\mei\drivers\sol\mesrl.inf** and **mesrle.inf** to **c:\drivers\SOL**.
6. Open **c:\drivers\SOL\mesrl.inf** in a text editor like Notepad.
7. Find the [Intel.NTx86.6.0] section and edit it to look like this:

```
[Intel.NTx86.6.0]
; Windows Vista
;AMT 7
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_3B67&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_1C3D&CC_0700"
;AMT 6
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_3B67&CC_0700"
;AMT 5
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E07&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E17&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E27&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E37&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E97&CC_0700"
;AMT 4
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A47&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A57&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A67&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A77&CC_0700"
;AMT 3
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29B7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29C7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29D7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29E7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29F7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28B7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28C7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28D7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28E7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28F7&CC_0700"
;AMT 2.5
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A07&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A17&CC_0700"
;AMT 2
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2987&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2997&CC_0700"
```

8. Open **c:\drivers\SOL\mesrle.inf** in a text editor like Notepad.

9. Find the [Intel.NTamd64] section and edit it to look like this:

```
[Intel.NTamd64]
;AMT 7
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_3B67&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_1C3D&CC_0700"
;AMT 6
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_3B67&CC_0700"
;AMT 5
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E07&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E17&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E27&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E37&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2E97&CC_0700"
;AMT 4
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A47&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A57&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A67&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A77&CC_0700"
;AMT 3
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29B7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29C7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29D7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29E7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_29F7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28B7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28C7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28D7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28E7&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_28F7&CC_0700"
;AMT 2.5
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A07&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2A17&CC_0700"
;AMT 2
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2987&CC_0700"
%SRL_DeviceDesc% = ComPort, "PCI\VEN_8086&DEV_2997&CC_0700"
```

Create the VNC Server Start script

1. Create a text file named **c:\vnc\vnicsvr.cmd** in a text editor like Notepad.
2. Edit the file to look like this. Note for 64 bit only: replace %VNCLIC% with your license key.

```
@echo off
:: Turn off WinPE firewall
wpeutil disablefirewall
if %PROCESSOR_ARCHITECTURE%==AMD64 goto vnc64
:vnc32
:: Apply VNC settings
regedit /s "%~dp0settings.reg"
:: Start VNC Server for 32bit
start /MIN "" "%~dp0winvnc4.exe" -noconsole
goto sol

:vnc64
:: Apply VNC settings
"%~dp0vncconfig.exe" -noconsole -license %VNCLIC%
regedit /s "%~dp0settings.reg"
:: Start VNC Server for 64bit
"%~dp0winvnc4.exe" -register
"%~dp0winvnc4.exe" -start
goto sol

:sol
:: Start - Load SOL and notify remote user ::
:: Note - if you don't want SOL, just leave out the .inf and this section is
skipped ::
:: mesrl.inf for 32, mesrle.inf for 64
set SOLINF=mesrl.inf
if %PROCESSOR_ARCHITECTURE%==AMD64 set SOLINF=mesrle.inf
:: Check for the SOL driver
If not exist %SYSTEMDRIVE%\windows\inf\%SOLINF% goto end
:: Load SOL driver
drvload %SYSTEMDRIVE%\windows\inf\%SOLINF% 2>&1 >nul
:: Find SOL port
for /f "tokens=3" %%A in ('reg query HKLM\Hardware\Devicemap\Serialcomm /s
^| find /i "REG_SZ"') do (
set COMPORT=%%A
)
:: If SOL port found, notify user that VNC server is up.
if "%COMPORT%"==" " goto end
echo . > %COMPORT%
echo . > %COMPORT%
echo . > %COMPORT%
```

```
echo You may connect to VNC server now. > %COMPORT%  
:: End - Load SOL and notify remote user ::  
  
:end
```

3. Save the file and exit the editor.

3.2.2 Install MSDaRT

1. Mount the MDOP ISO (we suggest Virtual CloneDrive for mounting .iso files) or burn it to a CD and insert the CD on the Technician PC.
2. Double click **<cd drive>:launcher\launcher.hta**.
3. Click the **Diagnostics and Recovery Toolset** icon.
4. Click **Install MSDaRT 6.5 <arch>**. Select the architecture for use on the Managed Client with Intel vPro Technology.
5. Follow the install Wizard, selecting defaults and/or "Typical" options.
6. Close the launcher.

3.2.3 Build MSDaRT Boot Media (ERD Commander)

1. Open ERD Commander Boot Media Wizard.
2. Click **Next**.
3. Insert your Win7 DVD. Be sure the Architecture matches your target Managed client with Intel vPro technology.
4. Click **Browse** and locate the DVD.
5. Click **Next**.
6. Click **Next** again.
7. Tool Selection:
 - Make your choices. We recommend all tools. Click **Next**.
8. Crash Analyzer Wizard:
 - a) It should detect your Windows Debugging tools install. Verify the path is correct. For this doc, it is "c:\Program Files\Debugging Tools for Windows (x86)".
 - b) Click **Next**.
9. Select **Yes** to download the latest definitions. When download is complete, click **Next**.
10. Additional Drivers:
 - a) Do **not** add LAN drivers here. They will be added using the WAIK later. You may add other drivers as needed. Note: in most cases, only LAN drivers are required as MSDaRT has built in support for IDE, AHCI and most other devices.
 - b) Click **Next**.

11. Additional Files:

- a) Click **Show Files...**
- b) Take note of the path to the folder just opened. From here on, when you see **<mount path>** substitute this path.
- c) Copy the contents of **c:\vnc** to **<mount path>\windows\system32**
- d) Copy the contents of **c:\drivers\sol** to **<mount path>\windows\inf**
- e) Open **<mount path>\windows\system32\winpeshl.ini** with a text editor like Notepad and edit it to look like this:

```
[LaunchApps]
"%windir%\system32\cmd.exe /C %windir%\system32\startnet.cmd"
%windir%\system32\netstart.exe,-prompt
%SYSTEMDRIVE%\sources\recovery\recenv.exe
```

- f) Open **<mount path>\windows\system32\startnet.cmd** with a text editor like Notepad and edit it to look like this:

```
wpeinit
start "" cmd /c "%~dp0vncsvr.cmd"
```

- g) Apply drivers using the WAIK as follows:

- Click **Start -> Programs -> Microsoft Windows AIK -> Deployment Tools Command Prompt** then right-click Deployment Tools Command Prompt and select Run As Administrator.
- Add LAN driver with the following commands:

For 32bit

```
Dism /image:<mount path> /Add-Driver
/driver:C:\drivers\lan\32\e1k6232.inf
Dism /image:<mount path> /Add-Driver
/driver:C:\drivers\lan\32\e1c6232.inf
```

For 64bit

```
Dism /image:<mount path> /Add-Driver
/driver:C:\drivers\lan\64\e1k62x64.inf
Dism /image:<mount path> /Add-Driver
/driver:C:\drivers\lan\64\e1c62x64.inf
```

Note: adjust the path to point to the bolded file.

- Drivers are added. Close the command prompt with the exit command.
- h) If you'd like to add additional files to the boot image, do so here. Note: it is advised to keep the boot image as small as possible in order to speed remote booting. Only add files you need. No other files are required for MSDaRT to function.
 - i) Click **Next**.

12. Create Startup Image

- a) Select a location to save the new MSDaRT.iso file and name it as desired. This document places it on the desktop.
- b) Click **Next**.

13. Burn to Recovery CD:

- a) Deselect **Burn the image....**
- b) Click **Next**.

14. Click **Finish**.

Congratulations, you have built a MSDaRT image. Now, you are ready to remote boot it. Proceed to section 4, Perform IDER Boot and Basic Remote Tasks, on page 23.

4 Perform IDER Boot and Basic Remote Tasks

This section outlines two methods of booting and using MSDaRT. The first method uses KVM Remote Control and IDER. This is useful for \geq Intel AMT 6 with Intel® Integrated Graphics. The second method uses SOL/IDER plus the VNC server built into WinPE (as described above). This is useful for any Intel vPro technology based system.

Note that the time an IDER boot takes can vary based on a number of factors such as LAN speed, load on the Help Desk Console, and the size and complexity of the image being booted to. Unfortunately, MSDaRT's size is not conducive for fast remote booting. However, once you have a known working image, it may be used with the 2 stage boot process. Upon completion of this UCRD, please see <http://communities.intel.com/docs/DOC-5552> and <http://communities.intel.com/docs/DOC-5616> to significantly reduce the time it takes to remotely boot MSDaRT.

4.1 KVM Remote Control and IDER

This example uses RealVNC's VNC* Viewer Plus. Please substitute your favorite KVM Remote Control and IDER capable tools. Also, this example uses a Dell E6410 that has been provisioned locally. We are using the admin digest credential and no TLS. See the following for more information.

http://communities.intel.com/docs/DOC-4795	Quick KVM Remote Control for Brand New Intel Core vPro Processor Based PCs
http://communities.intel.com/docs/DOC-4354	Local Setup and Configuration Using a USB Flash Drive
http://communities.intel.com/docs/DOC-4910	Help Desk Console for Non-TLS Environments; more information about VNC Viewer Plus

If your system is using Kerberos and/or TLS, adjust the steps below as needed.

1. If desired, download and install RealVNC's VNC Viewer Plus:
<http://www.realvnc.com/products/viewerplus/index.html>
2. Open VNC Viewer Plus.
3. Click **Options**.
4. Select the **AMT Server** tab.
5. Deselect **Always connect using FQDN**.
6. Click **OK**.
7. Enter the IP address of the remotely managed Intel vPro technology based system.
8. Set **Connection mode** to **Intel AMT**.
9. Set **Encryption** to **None** (or adjust based on your setup).

10. Click **Connect**.
11. Enter your Intel AMT Admin credentials and click **OK**.
12. Enter a **User Consent Code** if prompted.
13. Click the Mount Disk Images menu icon, shown in Figure 1 below.



Figure 1: The VNC* Viewer Plus Mount Disk Images Menu Icon

14. A Mount Disk Images window is displayed. Click **Browse** next to CD/DVD.
15. Enter **select the DaRT image created above**.
16. Click **Mount**.
17. Place the mouse near the top of the screen and click the **Power** icon.
18. Click **Reset**.
19. Select **Boot to CD/DVD**.
20. Click **Reset**.

The Intel vPro technology based system will now reboot. It will automatically boot from the MSDaRT ISO file created above. As it boots, the KVM Remote Control session will display progress. Once the boot process is complete proceed to section 4.3.

4.2 Serial over LAN and IDER

This example uses Remote ISO Launcher, although you can substitute your favorite SOL and IDER capable tools. Also, this example uses an Intel® Desktop Board DQ45CB that has been provisioned locally. We are using the admin digest credential and no TLS. See the following for more information:

http://communities.intel.com/docs/DOC-4354	Local Setup and Configuration Using a USB Flash Drive If your system is using Kerberos and/or TLS, please adjust the steps as needed
http://communities.intel.com/docs/DOC-5943	Remote ISO Launcher (RIL)

If your system is using Kerberos and/or TLS, adjust the steps below as needed.

1. If desired, download Remote ISO Launcher:
<http://communities.intel.com/docs/DOC-5943>. Section 4 outlines generic steps to use RIL. Or, follow the steps below.
2. Unzip the download files included with this UCRD.
3. Navigate to the folder where you unzipped the files and double-click **RemoteISOLauncher.exe**.

4. On the Launch tab, click **File > Edit ISO Images**. The Manage ISO Images dialog is displayed.
5. Enter MSDaRT for the **Name** and enter the **Path** for (or navigate to) your MSDaRT image (UNC paths are NOT allowed) and click **Add**.
6. Click **Done** to close the dialog.
7. On the **Settings** tab, enter "admin" for **username** and the admin password. Set **Encryption** to "none". Leave the rest default.
8. On the Launch tab, enter the hostname, FQDN, or IP address of the target remote client to be rebooted
9. To save these settings (hostname, authentication and encryption settings, ISO names and paths, etc.), click **File > Save Config** from the menu bar.
10. Click the button for MSDaRT. Your Managed Client will reboot to the MSDaRT image.

**NOTE**

The following steps rely on having the VNC Sever embedded in MSDaRT.

11. If you opted to include the SOL drivers, MSDaRT will notify you after the VNC server has started. To see this notification, select the Terminal tab. Look for the message, "You may connect to VNC server now." Example provided below. Note: some systems may not show the SAC messages. This is OK.

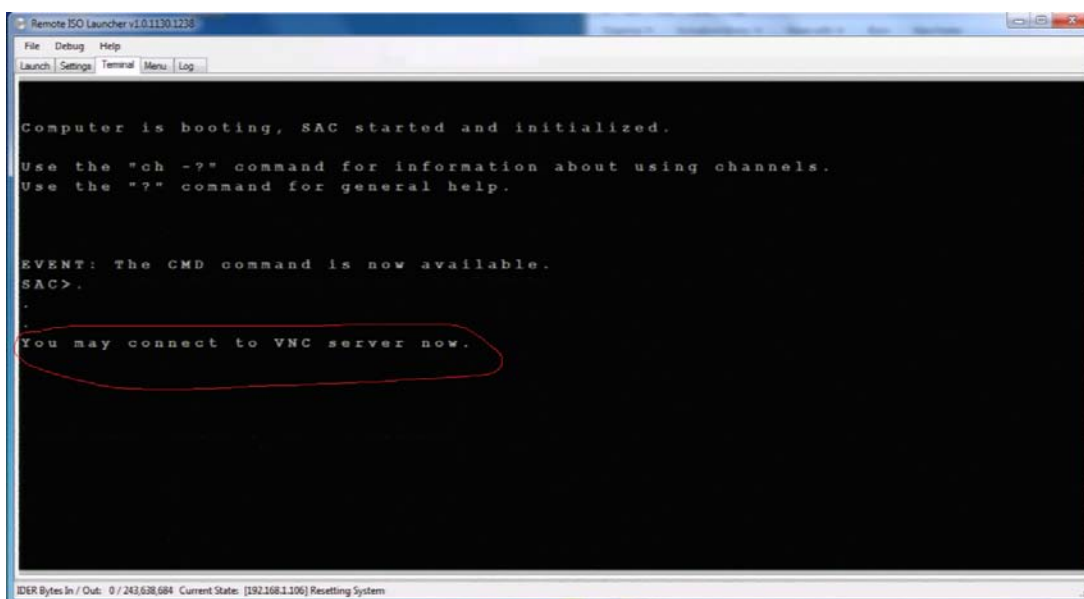


Figure 2: The Remote ISO Launcher Terminal Tab Window

12. Open RealVNC Viewer (you installed it in section 3.2.1.6).
13. Enter the IP address or FQDN of your remotely managed Intel vPro based system and click **OK**.

14. Enter the VNC Server password you set in section 3.2.1.6.

You now have full remote control of MSDaRT. Proceed to section 4.3 for some of the tools and possibilities available from here.

4.3 Once You are Connected

1. Select a Keyboard type that matches yours and click **Next**.

At this point MSDaRT scans the system and then begins a series of questions based on what it finds. See MS documentation for more info. The below steps are the basic path through, but may differ based on the results of the scan.

2. System Recovery Options: Select the desired OS and click **Next**. You are presented with a **System Recovery Options** screen as follows:

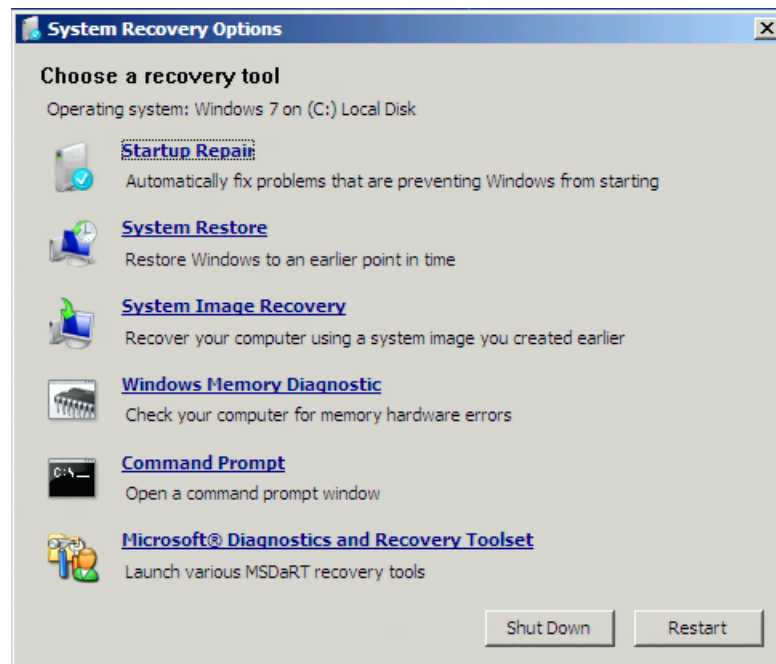


Figure 3: System Recovery Options Screen

3. You may choose any of these tools. Or, click **Microsoft Diagnostics and Recovery Toolset**. This will present the MSDaRT tools menu:

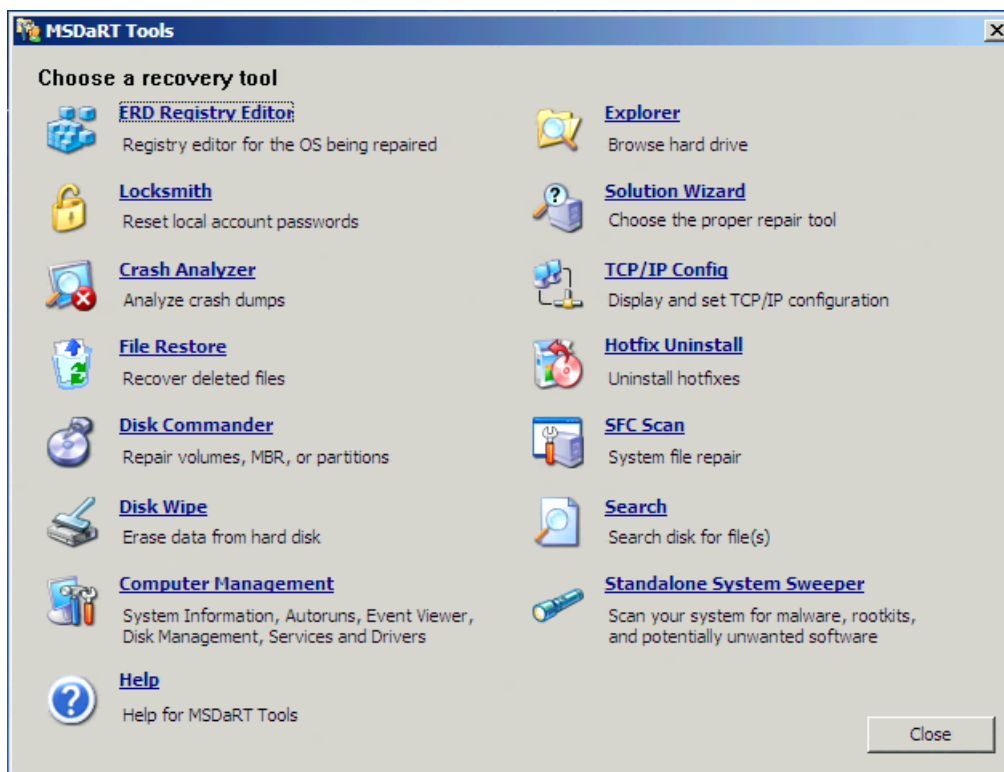


Figure 4: MSDaRT Tools Screen

At this point, you may use any of these tools just as you would if you were sitting in front of the Intel vPro technology based managed client. As such, specific use of these tools is beyond the scope of this document. Please refer to Microsoft documentation for steps on specific tasks with these tools:

<http://www.microsoft.com/windows/enterprise/products/mdop/dart.aspx> and
<http://technet.microsoft.com/en-us/library/ee460914.aspx>