

# Intel® vPro™ Technology Use Case Reference Design

Accelerating the Intel vPro Technology IDER Boot Process

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# Revision History

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# 1 Preface

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When diagnosing computer issues, it is often useful to boot to a CD or USB flash drive containing recovery and diagnostic tools. With Intel® vPro™ technology, a Service Desk technician can use IDER to employ these types of tools without leaving his desk. However, as the tools become larger, the boot times become longer. To mitigate longer boot times, a two-stage boot process may be used, causing the same larger tools to boot in less time. This process uses IDER to boot a very small operating system (OS) with network drivers and a boot loader (stage 1). This OS then downloads the intended tool from a nearby network share, web server, or even the remote client's local hard drive, then copies it to a RAM drive and boots to it (stage 2).

## 1.1 Document Scope

This document provides an overview and procedures for utilizing a two-stage boot process. Readers will create a customized small ISO file for use in booting a remote client over an IDER connection (stage 2). When booted, this ISO will reboot the remote client to a second image file over a network connection (or from the local hard drive).

## 1.2 Intended Audience

This document is intended for IT Service Desk staffers and service desk process developers who wish to increase their remote use of recovery and diagnostic tools. Also, recovery and diagnostic tool developers will find use in this document as they can tailor their tools for and support their customers during remote use of the tools.

## 1.3 Related Documentation

The following links and documents contain information that may be useful in better understanding the two-stage boot process. These documents are referenced later in this document.

- Use Case Reference Design, *Enhanced Remote Repair with Microsoft Windows PE*  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=)
- Use Case Reference Design, *Quick KVM Remote Control for Brand New Intel Core vPro Processor Based PCs*  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20947&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20947&lang=eng&OSVersion=&DownloadType=)
- Use Case Reference Design, *Local Setup and Configuration Using a USB Flash Drive*  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20979&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20979&lang=eng&OSVersion=&DownloadType=)
- Use Case Reference Design, *Help Desk Console for Non-TLS Environments*  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20962&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20962&lang=eng&OSVersion=&DownloadType=)
- Use Case Reference Design, *EZ Help Desk Console Extender*  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20954&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20954&lang=eng&OSVersion=&DownloadType=)

## 2 Introduction

As you may know, a managed client with Intel vPro technology can boot diagnostic and recovery tools from across a network connection. This uses a feature of Intel vPro technology called IDER (IDE redirection) which essentially makes the Intel vPro technology based system believe that a CD-ROM or floppy disk has been inserted. In reality, the disk lives as an image file on the network.

Booting an Intel vPro technology based client to a diagnostic or recovery tool remotely can be advantageous when the client's installed OS is down and you need to access the client's file system to run diagnostics, perform remediation, or retrieve vital information. Since it's remote, no desk side visit is required.

However, as these tools become larger, boot times will increase. One way to speed up the process is to use a two-stage boot process. First, using IDER, the client boots a small image containing network drivers and a boot loader called Grub4DOS. This image then establishes a network connection to a nearby shared location or web server. In this location is an image of the desired recovery or diagnostic tool.



### NOTE

*You can also specify the remote client's hard drive as the location of the recovery or diagnostic tool/image.*

The stage 1 image downloads the desired image and reboots to it. Using this method the boot time can potentially be much faster than using IDER to directly boot the larger image.

This Use Case Reference Design describes the two-stage boot process and the tools used to create a custom first-stage ISO file to boot across the SOL/IDER connection.

## 2.1 Requirements

An example is used to illustrate the process described in this document. The steps outlined in the document example have the following requirements:

Help Desk Console	Any PC with Microsoft* Windows XP or later. <b>Note:</b> This document is written to pertain to Windows 7.
Server	<ul style="list-style-type: none"> <li>Hosts a network share or web server for storing desired recovery or diagnostic tools</li> </ul> <p><b>Note:</b> the share must be a CIFS share. This includes a Microsoft Windows share, SAMBA share, or Microsoft DFS share.</p> <p><b>Note:</b> This can be the Help Desk Console or a separate server. This document uses a separate server running a Microsoft DFS share.</p>
Managed Client with Intel vPro technology	<ul style="list-style-type: none"> <li>Intel® Active Management Technology (Intel® AMT) 2.0 or higher.</li> <li>For KVM Remote Control - Intel AMT 6.0 or higher with Intel Integrated Graphics</li> </ul>

	<p><b>Note:</b> Document example uses an Intel® Desktop Board DQ57TM based system as an example.</p> <p><b>Note:</b> Currently this process is only supported over a wired network connection.</p> <p><b>Note:</b> Currently this process is only supported via Legacy BIOS booting. Unified Extensible Firmware Interface (UEFI) booting is not supported. For computers with UEFI, enable the Compatibility Service Module (CSM) in BIOS.</p>
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## 2.2 Process Overview

The following is a high-level overview of the two-stage boot process. Each high level step is discussed in detail in the subsequent sections of this document.

1. Choose the Diagnostic and Recovery tools you wish to use with this process.
2. Place images of these tools on a network share, web server, and/or your remote clients' hard drives (at the root folder level).
3. Use the included ISO Builder application to create a custom first-stage ISO containing the user name, password, domain, share or web server path, and filename of the second-stage ISO.
4. Establish an IDER connection to a managed client and redirect it to boot the first-stage ISO you created in the previous step. The managed client quickly boots the small first-stage ISO.
5. For network shares, if you did not specify a particular second-stage image file when you created the first-stage ISO, choose a second-stage image file from among the files listed on the specified share. For web servers, you must specify the ISO file name as part of the web server path (i.e., "http://server\_path/isofile.iso"). For remote client local hard drive, specify the file name to boot from. If the image file is not found on the local hard drive, the process reverts to looking on the specified network share.
6. The managed client boots the full-featured second-stage image file over the fast network connection.



## 3 Preparing the Two-Stage Boot Environment

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Preparing the two-stage boot environment entails a few tasks. First, identify the bootable repair and recovery tool(s) you wish to use remotely. Once identified, create image files (stage 2 image file) of the boot disk for the tool. Finally, place the image files on network share(s) or web servers that are near by the Intel vPro technology based systems (or on your managed clients' hard drives at the partition root). It should be noted that there are known limitations with the two-stage process. These will be discussed throughout the document. Also note that this tool requires specific BIOS support which some systems do not have. It is recommended that you try this process with each OEM and BIOS version you plan to deploy to ensure successful operation.

See Appendix A: How It Works on page 19 for more technical details on how the process works.

### 3.1 Identifying the Tools and Creating the Stage 2 Image

In this step you choose the tool or tools you wish to use remotely and create stage 2 image file(s).

There are three alternatives:

- use the WinPE OS described in an existing UCRD document
- choose one of the many existing bootable rescue and recovery disks
- create your own tool(s)

WinPE is the recommended method for the first pass through these instructions.

The following three subsections describe the three alternatives in more details. The result of this step will be a stage 2 image file.

#### 3.1.1 Using WinPE (recommended)

You can create and use WinPE by following these instructions:

[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=\\_](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=_)

Please download that UCRD and build WinPE. The resulting file is **winpe.iso**. For the purpose of the document example, this will be your stage 2 image file. Proceed to section 3.2 on page 10.

### 3.1.2 Using Existing Tools

There are many great recovery tools on the internet. However, please note that when using the process outlined by this document, there are some limitations. See the next subsection, 3.1.3 Create your own Recovery OS, for more details.

Once you've identified a bootable tool you must save it to a file as either a .iso (CR-ROM or DVD-ROM image), a .img (Floppy image), or a .hd (Raw Hard Drive Image).

### 3.1.3 Building Your Own Tool(s)

Building your own rescue and recovery tool can produce a very good recovery tool since it is tailor made to suit your needs. However, please note that when using the process outlined by this document, there are some limitations.

Due to the way Grub4DOS (a component used by the Stage 1 image) mounts and emulates the CD-ROM as a RAM drive, DOS and all boot loaders can access the CD in RAM. However, Windows and Linux\* cannot access it without special drivers. For WinPE this is not an issue because WinPE copies itself into its own RAM drive before booting. For a full Windows installation, however, this will be a problem.

The same issue exists with Linux. This method will work where Linux copies from the CD and runs in RAM, such as in the case of Remote Drive Mount, available at the link below:

[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&ProdId=2557&DwnldID=20975&ProductFamily=Software+Products&ProductLine=Manageability+Products&Product=Intel%C2%AE+vPro%E2%84%A2+Technology&keyword=remote+drive+mount&DownloadType=Reference+Designs&lang=eng](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&ProdId=2557&DwnldID=20975&ProductFamily=Software+Products&ProductLine=Manageability+Products&Product=Intel%C2%AE+vPro%E2%84%A2+Technology&keyword=remote+drive+mount&DownloadType=Reference+Designs&lang=eng)

However, where Linux accesses the CD directly, this method will not work without special modification of the Linux kernel. Please refer to the article at the following link, in section "INT13 access: Not all images will boot completely!" for more information as the same issues and solutions that exist for MEMDISK exist for Grub4DOS.:

<http://syslinux.zytor.com/wiki/index.php/MEMDISK>

One final limitation is that the stage 2 image file may not be greater than 500 MB (note that this is not the case for image files located on the remote system's hard disk drive).

If this method is not a good alternative for you, simply use the WinPE ISO that is created from the UCRD specified above

([https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20957&lang=eng&OSVersion=&DownloadType=) ).

## 3.2 Copying the Image to a Network Share or Web Server

The two-stage boot process requires that the second-stage, full-featured image file(s) be placed on a network share or web server that is accessible to the managed client(s). This is so the managed client can find the full-featured image once it has booted the small, first-stage ISO containing network drivers. This is an advantage of

the two-stage process because the full-featured image may be placed on a network share or web server that is closer to the managed client. For example, if the service desk is in the USA but the managed client is in Malaysia, the image may be placed on a network share or web server in Malaysia.

Another possibility to improve performance of network shares is to use a distributed file system. The only requirement is that the share be CIFS (Common Internet File System) based (including a Microsoft Windows share, SAMBA share, or Microsoft DFS share) and that the managed client can reach the network share via a wired network connection.

It is recommended that a special user account with read-only access be created for accessing this share. This account will be used by the stage 1 ISO. If this is not desired, identify a user account that the stage 1 ISO will use.

Once you've identified the share and the user account, copy the stage 2 images to it. For this example we created a shared folder called **ittools** and gave the user **itproadmin** read-only access.



#### NOTE

*Whatever network speed your managed client had established prior to rebooting to the first-stage ISO (for example, 1 Gbps) is the speed the client will use after rebooting to the first-stage ISO.*

## 3.3 Installing the Recovery Image or Tool to All Clients

If you plan to launch a recovery image or tool from the managed client's hard drive as your second stage boot, follow the instructions in this section.

Ideally, the recovery image or tool should be pre-installed on all systems *before* an end user calls the help desk. Specific steps to pre-install are not covered by this document. Rather, it is expected that recovery images and tools would be installed using standard software delivery methods and processes already in place by IT (such as using Microsoft Configuration Manager to create a software deployment package and deploy this to all desired clients, or simply using a USB flash drive to copy the files to the client).

The goal is to place the recovery image or tool at the root of any partition. That is, it could land on c:\ros.iso or d:\ros.iso. It really doesn't matter which partition as long as the recovery image or tool is in the root. It also doesn't matter what file system the partition is (NTFS, FAT32, EXT3). This is an advantage of Grub4DOS.

## 4 Customizing the First-Stage ISO

Included with this Use Case Reference Design is an application called “ISO Builder” (**iso\_builder.hta**) which is used to customize the small, first-stage ISO (**ifast.iso**) that the remote client will boot over the SOL-IDER connection. The resulting customized first-stage ISO file will contain the following information:

<b>Try Local Hard Drive</b>	Instructs first stage ISO to look for second stage image or tool on the managed client's hard drive (in the partition root).
<b>Image</b>	File name of the second stage image or tool to boot (must be in partition root).
<b>Take input from</b>	Specify where to take input from (SOL terminal, KVM session, or specify source at time of image load).
<b>Download Type</b>	Web Server or Shared Drive.
<b>Authentication</b>	Yes or No. Is a user name and password required for accessing the download source location? Field displayed only if Web Server selected for <b>Download Type</b> .
<b>Username</b>	The user name that can log into the specified network resource where the second stage image file(s) reside (only needs read access). If Web Server is selected, field is displayed only if “Yes” is then selected for <b>Authentication</b> .
<b>Password</b>	The password for the specified user name. If Web Server is selected, field is displayed only if “Yes” is then selected for <b>Authentication</b> .
<b>Domain</b>	The Active Directory domain for the user. Field is displayed only if “Share Drive” is selected for <b>Download Type</b> .
<b>Path</b>	The share name and UNC path to the folder where the second stage image file(s) reside, or the web address of the web server.
<b>Image</b>	The file name of the image file to boot in stage two. Field is displayed only if “Share Drive” is selected for <b>Download Type</b> .



### NOTE

*The Path field accepts WGET command line options along with the path. For more information about WGET, see the following website:*

<http://www.gnu.org/software/wget/manual/wget.html>

The ISO Builder application asks you to enter the above information, which will be used to build the first-stage ISO. If you leave a field blank, the ISO will prompt for that information once it is booted on the managed client. For example, if you leave “Image” blank, the ISO will present a textual menu displaying all bootable image files found in the specified path/folder (not available for image files on the remote client's hard disk drive; you must specify the image file name in that case). If you leave any

other field blank, you are prompted to enter that information when the first-stage ISO finishes booting.

This section describes how to use ISO Builder to create the first-stage ISO file.

1. Open the UCRD download .zip file and extract the ISO Builder application file, `iso_buider.hta`, to the console system.
2. Double-click **iso\_builder.vbs** to run the ISO Builder application. The following screen is displayed.

**2 Stage Boot ISO Builder**

**Boot from Local Hard Drive**

Try Local Hard Drive:	Yes	Instructs first stage ISO to look for second stage image or tool on the managed client's hard drive (in the partition root). If bootable image not found, will default to network resource.
Image:	ros.iso	File name of the second stage image or tool to boot (must be in partition root).

**Boot from Network Resource**

Try Network Resource:	Yes	Instruct first stage ISO to look for second stage image or tool on a network resource.
Take input from:	KVM Session	Specify where to take input from (SOL terminal, KVM session, or specify source at time of image load).
Download Type:	Share Drive	Web Server or Shared Drive.
Username:	itproadmin	The user name that can log into the specified network resource where the second stage image file(s) reside. Only needs read access.
Password:	P@ssw0rd	The password for the specified user name.
Domain:	vprodemo.co	The Active Directory domain for the user. (e.g., vprodemo.com) Note: leave blank if there is no domain.
Path:	\\192.168.0.2\ider	The share name and UNC path to the folder where the second stage image file(s) reside. (e.g., \\dc1.vprodemo.com\ider)
Image:		The file name of the image file to boot in stage two.

Save Settings Build ISO Close

**Figure 1: The ISO Builder Main Screen**

3. Enter the appropriate information for each field, as desired. Remember, the ISO will prompt for whatever information you do not enter here once it boots on the managed client (**NOTE:** the web server path **MUST** include the ISO file name).
4. Click **Build ISO**. The ISO Builder creates the file **ifast.iso** in whatever folder you launched ISO Builder.

## 5 Performing a Remote Two-Stage Boot

Once you have prepared your environment and created your custom first-stage ISO, you are ready to perform a two-stage boot on a managed client.

Do the following:

1. Copy **ifast.iso** to the Help Desk console. This file was built in section 4, Customizing the First-Stage ISO.
2. Using your favorite IDER enabled console, perform an IDER boot to **ifast.iso**. Detailed examples are provided below.
3. Depending on the options you chose in section 4, the managed client may prompt you for input or will automatically boot to your stage 2 image.
4. IDER can be disconnected at this point.

The following subsections describe three alternative IDER-enabled consoles and how to use them.

### 5.1 Alternative 1: Remote ISO Launcher

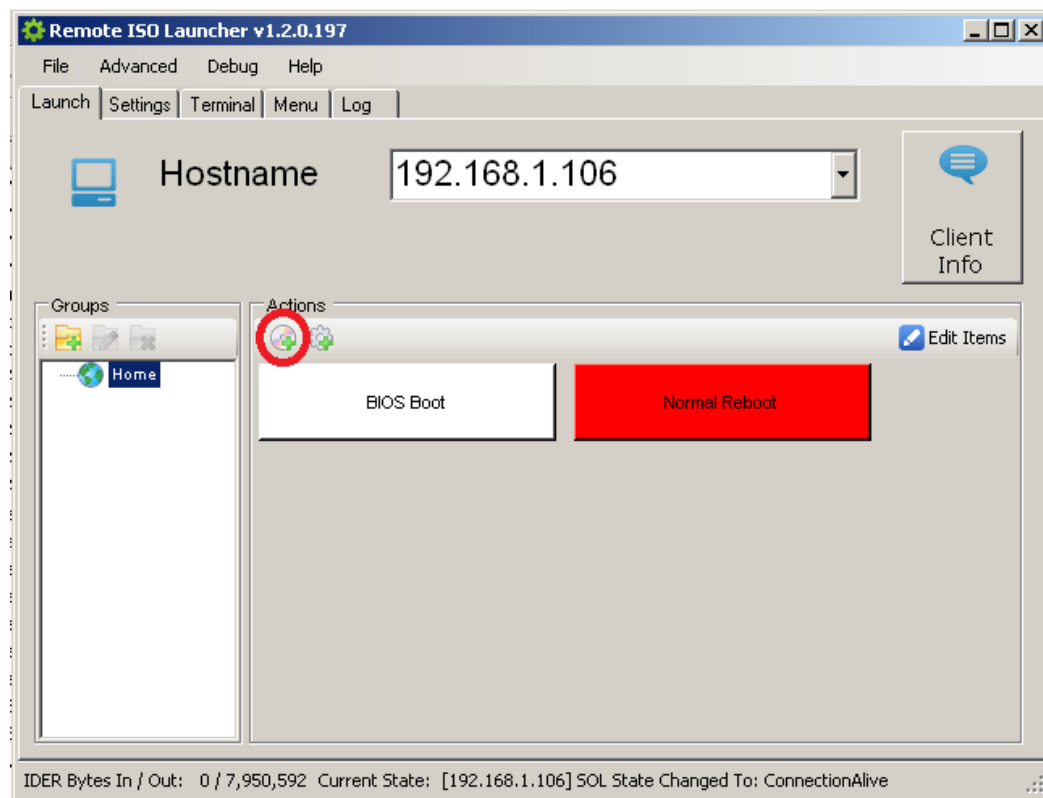
This example uses Remote ISO Launcher (RIL). RIL has special integration with ifast.iso to improve usability. The stage 2 image in this example was created with the WinPE UCRD and is 32 bit. Lastly, this example uses an Intel® Desktop Board DQ57TM that has been provisioned locally. We are using the admin digest credential and no TLS. See the following UCRD documents for more information.

<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20961&amp;lang=eng&amp;OSVersion=&amp;DownloadType=http://communities.intel.com/docs/DOC-4795">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20961&amp;lang=eng&amp;OSVersion=&amp;DownloadType=http://communities.intel.com/docs/DOC-4795</a>	Remote ISO Launcher
<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	Local Setup and Configuration Using a USB Flash Drive

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

5. Download and install Remote ISO Launcher as described by the link below:  
[https://downloadcenter.intel.com/Detail\\_Desc.aspx?agr=Y&DwnldID=20961&lang=eng&OSVersion=&DownloadType=](https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=20961&lang=eng&OSVersion=&DownloadType=)

6. In the RIL app folder, double-click **RemoteISOLauncher.exe** to launch the RIL app.



**Figure 2: Remote ISO Launcher**

7. To create a Boot Image button for ifast.iso, click the CD+ icon circled above.
8. In the Manage ISO Images dialog, enter **2 stage boot** for the Friendly Name and click **Browse** to browse to the location of the ifast.iso file.
9. Click **Add**. The friendly name "2 stage boot" appears in the lower pane, along with the path you selected.
10. Click **Done**. The Manage ISO Images dialog closes, and now the button **2 stage boot** appears in the Boot Images pane of the Launch tab. Note
11. Click **File -> Save**.
12. On the Launch tab, enter the IP Address of the Intel vPro technology based system.
13. If desired, click **Client Info** to ensure that RIL can communicate with this Managed Client.
14. Click the Settings tab and enter the Intel AMT username and password. Adjust any other settings as required by Intel AMT's configuration.
15. Click the Launch tab.
16. Click your new **2 stage boot** button in the Boot Images

The Intel vPro technology based system will now reboot to the stage 1 image (**ifast.iso**). Depending on your options, it will prompt for input and then automatically boot from the stage 2 image (**winpe.iso** in this example) located on the specified network share or web server or local hard disk drive. Once the boot process is complete, you will see a command prompt: `z:\windows\system32`. If remote control of the system is required, a KVM viewer to control AMT or a remote viewer built for winpe.iso may be used.

## 5.2 Alternative 2: KVM Remote Control

This example uses RealVNC's VNC\* Viewer Plus. Please feel free to substitute your favorite KVM Remote Control and IDER capable tools. Also, the stage 2 image in this example was created with the WinPE UCRD and is 32 bit. Lastly, this example uses an Intel® Desktop Board DQ57TM that has been provisioned locally. We are using the admin digest credential and no TLS. See the following UCRD documents for more information.

<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20947&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20947&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	Quick KVM Remote Control for Brand New Intel Core vPro Processor Based PCs
<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	Local Setup and Configuration Using a USB Flash Drive
<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20962&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20962&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	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. Enter the IP address or FQDN of the remotely managed Intel vPro technology based system.
4. Set **Connection mode** to **Intel AMT**.
5. Set **Encryption** to **None** (or adjust based on your setup).
6. Click **Connect**.
7. Enter your Intel AMT Admin credentials and click **OK**.
8. Enter a **User Consent Code** if prompted.



9. Click the **IDE-Redirection** menu icon, shown in Figure 3 below.



**Figure 3: The VNC\* Viewer Plus IDE-Redirection Menu Icon**

10. An IDE Redirection window is displayed. Click **Browse**.

11. Enter **C:\ifast.iso** and click **Share**.

12. Do one of the following:

- Graceful reboot:  
Click **Start -> Shutdown -> Restart**
- Forced reboot:  
Place the mouse near the top of the screen and click the Power icon.  
Choose **Reset**. Select **CD-ROM**.

The Intel vPro technology based system will now reboot to the stage 1 image (**ifast.iso**). Depending on your options, it will prompt for input and then automatically boot from the stage 2 image (**winpe.iso** in this example) located on the specified network share or web server or local hard disk drive. As it boots, the KVM Remote Control session will display progress. Once the boot process is complete, you will see a command prompt: `x:\windows\system32`.

### 5.3 Alternative 3: Serial over LAN and IDER

This example uses Radmin\*, although you can substitute your favorite SOL and IDER capable tools. Also, the stage 2 image in this example was created with the WinPE UCRD. It is 32 bit and has a VNC server embedded. Lastly, this example uses an Intel Desktop Board DQ57TM that has been provisioned locally. We are using the admin digest credential and no TLS. See the following UCRD documents for more information:

<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20979&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	<i>Local Setup and Configuration Using a USB Flash Drive</i>  If your system is using Kerberos and/or TLS, please adjust the steps as needed
<a href="https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20954&amp;lang=eng&amp;OSVersion=&amp;DownloadType=">https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&amp;DwnldID=20954&amp;lang=eng&amp;OSVersion=&amp;DownloadType=</a>	<i>EZ Help Desk Console Extender</i>

Follow the steps below:

1. If desired, download and install Radmin Viewer (server is not needed):  
<http://www.radmin.com/>
2. Open the Radmin Viewer.
3. On the menu bar, click **Connection > New Connection**.
4. Enter a name for the remotely managed Intel vPro technology based system.
5. Enter the remotely managed system's IP address.
6. Click OK.
7. Right-click the remotely managed system and select **Intel AMT -> Network Boot** from the menu.
8. Enter your admin credentials.
9. Select **Boot from ISO or Image File**.
10. Click **Browse** and browse to **C:\ifast.iso**.
11. Click **OK**.
12. A SOL window will open and the Intel vPro based system will reboot to the stage 1 image (**ifast.iso**).
13. Depending on your options, it will prompt for input and then automatically boot from the stage 2 image (**winpe.iso** in this example) located on the specified network share or web server or local hard disk drive.
14. Once the remotely managed system boots, it will display a command window:  
x:\windows\system32.



#### NOTE

*The following steps rely on having the VNC Sever embedded in WinPE. If you opted not to include it, you cannot complete the remainder of this procedure.*

15. Open RealVNC Free Viewer.
16. Enter the IP address of your remotely managed Intel vPro based system and click **OK**.
17. Enter the VNC Server password you set when creating WinPE.

You now have full remote control of WinPE.

# A Appendix A: How It Works

---

The stage 1 image is a custom Linux built to be small and fast. It includes the following:

- Network, IDER, and SOL drivers
- Grub4DOS – a boot loader
- kexec-tools – to execute the boot loader and stage 2 ISO
- param.xml – configuration file generated by iso\_builder.hta.
- WGET – Linux binary that connects to and downloads images from web servers

The process works like this:

1. Intel vPro technology based system boots **ifast.iso**, which loads the Grub4DOS boot loader.
2. If selected during the build process, Menu.lst causes Grub4DOS to search all hard drive partitions for the desired boot image.
3. If found, Grub4DOS copies it into RAM and maps the RAM drive to a virtual CD-ROM. Grub4DOS then causes the platform to boot to the Virtual CD-ROM.
4. If not found, Grub4DOS falls back to a small Linux kernel on ifast.iso.
5. Linux loads all drivers and starts a shell script.
6. Script reads **ifast.xml** for input. If KVM Remote Control or SOL is not specified, it checks both for a single key stroke. The first to enter a key stroke will be selected.
7. Any missing input is prompted for. On exception, if a user name is filled in but domain is blank, the script will not prompt for it. This is for setups that don't have a domain controller.
8. Once a stage 2 image is selected, it is loaded into RAM with kexec-tools.
9. Kexec then executes Grub4DOS which turns the stage 2 image in RAM into a RAM drive and then boots to it. Linux unloads.
10. Stage 2 image boots from its RAM drive.

## B Appendix B: Building the ISO

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The components needed to rebuild the first-stage boot ISO file **ifast.iso** are included in this Use Case Reference Design download package.

### B.1 Build System Requirements

The ISO must be built using a Linux system. Included are the necessary components and files to rebuild the included ISO file **ifast.iso**.

Prepare your system as follows:

1. Install Ubuntu 12.04LTS on an x86 (32bit) based system. **Note:** this will not work on a 64bit based Ubuntu install.
2. Verify that your system is connected to the Internet.
3. Launch a terminal and type the following commands to install required packages:
  - `sudo apt-get install python`
  - `sudo apt-get install libgirepository1.0-dev`
  - `sudo apt-get install gperf`
  - `sudo apt-get install libgudev-1.0-dev`
  - `sudo apt-get install libqtglib-2.0-0`
  - `sudo apt-get install libblkid-dev`
  - `sudo apt-get install upx-ucl`
  - `sudo apt-get install build-essential`
  - `sudo apt-get install zlib1g-dev`
  - `sudo apt-get install libncurses5-dev`
  - `sudo apt-get install nasm`
  - `sudo apt-get install cdc`
  - `sudo apt-get install libssl-dev`
  - `sudo apt-get install upx`
  - `sudo apt-get install libnl-3-dev`
  - `sudo apt-get install libglib2.0-dev`
  - `sudo apt-get install bison`
  - `sudo apt-get install flex`
  - `sudo apt-get install liblzma-dev`

## B.2 Building the ISO

Perform the following steps to build the ISO file **ifast.iso**.

1. Extract the **ifast.tar.gz** file onto your Linux system in any directory. The .tar is extracted to create a directory structure with the root directory "ifast".
2. Open a terminal session and navigate to the **ifast** directory.
3. Type "sudo make" and wait for the **ifast.iso** file to build.

## C Appendix C: Custom menu.lst

The image file **ifast.iso** uses a Grub4DOS boot loader. Grub4DOS's behavior is defined by menu.lst. By customizing menu.lst, Grub4DOS can be made to boot a partition, try multiple recovery OSs, load a hard drive image into RAM, present a menu of images and tools to the user, or all sorts of other useful things. To use a customized menu.lst, first edit menu.lst as desired. Then, copy it into ISO\_ROOT. Lastly, select "custom menu.lst" in iso\_builder.hta and build your ISO.

### C.1 Editing menu.lst

This is a light tutorial for menu.lst. For a full tutorial refer to the grub4dos Wiki tutorial page here: <http://diddy.boot-land.net/grub4dos/Grub4dos.htm> First, we'll examine the existing menu.lst. Note, comments start with a # and are left out of the following list

timeout 0	How long to display the menu. In this case, don't display it at all.
default 0	By default, boot to the first menu item.
title Recovery OS	Title of the first menu item
fallback 1	If this section fails, try section 1, the second menu item.
find --set-root --ignore-floppies /ros.iso	Search all partitions, except floppy disks, for ros.iso. If found, set that partition as the "root" or default partition for future commands.
map /ros.iso (0xff)    map --mem /ros.iso (0xff)	Map ros.iso to a virtual CD. If possible, use it directly from the hard disk, Otherwise, copy into RAM first. Note: (0xff) means virtual CD. This can be changed to (hd#) or (fd#). Replace # with a number. This number denotes the number of the device. For example, (fd0) is the first floppy device in the system.
map --hook	Causes map to perform the above operation. Always include this line as the last map command
chainloader (0xff)	Boot to the virtual CD-ROM device.
title 2 stage	Title of the 2nd menu section
find --set-root /initrd.bin	Search all partitions for initrd.bin. This should be present on the IDEr CD-ROM Device as part of ifast.iso.
kernel /vmlinuz ramdisk_size=512000 init=/sbin/init root=/dev/ram0	Specify the Linux kernel, the initrd file, and kernel options to boot.

initrd /initrd.bin	Boot the Linux Kernel
title commandline commandline	A menu item that will open a Grub4Dos command line. Note: this will only be shown if all other sources fail.

## C.2 Examples

Here are some examples:

**To boot rds.iso instead of ros.iso**, change **ros.iso** on lines 5 and 6 to **rds.iso**.

**To show a menu offering multiple options**, do the following:

1. Remove lines 1 and 2.
2. Copy lines 4 – 8
3. Change the new entries title and .iso file. For example, the result might look like the following:

```

title Recovery OS
find --set-root /ros.iso
map --mem /ros.iso (0xff)
map --hook
chainloader (0xff)
title OS Imaging
find --set-root /osd.iso
map --mem /osd.iso (0xff)
map --hook
chainloader (0xff)
title DOS with network support - BIOS updates
find --set-root /dos.img
map --mem /dos.img (fd0)
map --hook
chainloader (fd0)+1
title Remote Drive Share
find --set-root /rds.iso
map --mem /rds.iso (0xff)
map --hook
chainloader (0xff)
title commandline
commandline

```

**Try ros.iso. If missing, boot rds.iso that is resident on Trigger\_ros.iso.**

1. Add rds.iso to the root of Trigger\_ros.iso.
2. Adjust menu.lst as follows:

```
timeout 0
default 0
fallback 1
title Recovery OS
find --set-root /ros.iso
map --mem /ros.iso (0xff)
map --hook
chainloader (0xff)
title Remote Drive Share
find --set-root /rds.iso
map --mem /rds.iso (0xff)
map --hook
chainloader (0xff)
title commandline
commandline
```

**Boot a second hard disk partition**

Edit as follows:

```
title Boot Windows 7 Boot Loader from the 1st hard drive, second partition
chainloader (hd0,1)/bootmgr
title commandline
commandline
```

More information is available here:

<http://communities.intel.com/community/openportit/vproexpert/blog/2010/10/04/remotely-trigger-an-os-imaging-partition-to-boot-and-re-image-a-system>