

Topic: Component(s) Affected: Date: Building Client Images for Deployment Image Manager, PowerQuest December 17, 2002

## **OVERVIEW / ENVIRONMENT**

This document outlines the steps required for building and deploying a client system image. Specifically, it describes the steps for distributing a single image to multiple client systems on the same network.

## **DETAILED DESCRIPTION**

The steps below explain how to first build a single client image, and then deploy that image to multiple client systems. The following assumptions are made:

- PowerQuest Deploy Center is installed on a system. It can be installed on any system, but the best
  practice is to install it on a centralized system to which the IT Administrator has access. This allows
  Deploy Center to be used repeatedly without requiring installation on multiple machines.
- A Windows shared volume is accessible on a network Windows Server. Appropriate access permissions must be assigned to the share. For assistance on creating Windows Shares, please refer to your Windows Server Documentation or visit <a href="http://support.microsoft.com">http://support.microsoft.com</a>.

Once this preparation is in place, follow the steps on the following pages to create and deploy an image.



1. To create the image in PowerQuest Deploy Center, open Boot Disk Builder by selecting **Start->Programs->PowerQuest DeployCenter 5.0->Boot Disk Builder**.

2. On the first screen, select Microsoft TCP/IP Boot Disks and click Next.

🖶 PowerQuest Boot Disk	Builder 📃 🗖 🔀
<u>Eile I</u> ools <u>H</u> elp	
	This wizard helps you build PowerQuest boot disks.
Cente	PowerCast Boot Disks Novell NetWare IPX Client Boot Disks Microsoft TCP/IP Boot Disks Standalone Boot Disks
PowerQuest Deploy Boot Disk Builder	Description Creates Microsoft TCP/IP network client boot disks for connecting to Windows operating systems. Disk will not include ability to PowerCast.
	< <u>₿</u> ack <u>N</u> ext > E <u>x</u> it

Figure 1



3. In the **Choose Microsoft TCP/IP settings** window, enter the authentication information that you assigned to the share point created in Step 2. You must enter a **User name**, a **Workgroup/Domain** to which are you authenticating, and the UNC-formatted path to the network share. These paths should be in the form of \\servername\sharepointname. You do not have to enter the **Password** information. However, doing so will automate the boot process. Click **Next**.

🖷 PowerQuest Boot Disk Builder 📃 🗖 🚺
Eile <u>T</u> ools <u>H</u> elp
Choose Microsoft TCP/IP settings.     Network login information   User name:   Administrator   Inging gutomatically   Assword:   Confirm password:   Confirm password:   Drive letter:   UNC path:   Invie letter:   Invie letter:   UNC path:   Invie letter:   Invie letter:   Invie letter:   Invie letter:   Invie l

Figure 2



4. At the next screen, identify from where and how the ImageCenter application (pqimgctr.exe) will be launched. ImageCenter can be used to create, restore, and delete images. The three choices are:

- **Boot Disk** installs the appropriate files to the boot disk you are creating, be it a physical floppy, a specified directory, or a virtual floppy disk.
- Specified Location allows the computer to boot to a DOS prompt and run the ImageCenter application from a share point on your local network. If you select this option, you must make sure that the following files are available from the share point:

```
- pqImgCtr.exe
-pqDplCtr.rtc
```

• **Do not run ImageCenter –** specifies not to install the ImageCenter application on your boot media.

This screen also the option to enter command line parameters that are listed in the <code>autoexec.bat</code> file on the boot media.

When building the Microsoft TCP/IP boot disks to run from a Virtual Floppy Disk, entering the command line parameter A:\pqimgctr.exe causes the ImageCenter application to launch on start-up. If this parameter is not included, ImageCenter is launched only after entering A:\pqimgctr.exe at the command prompt. When finished, click **Next**.

🖶 PowerQuest Boot Disk	k Builder 📃 🗖 🔀
<u>File Tools H</u> elp	
PowerQuest DeployCenter Boot Disk Builder	Specify ImageCenter location and command line parameters.  Run ImageCenter from:  Bgot disk  Specifed location:  (Path must be in 8.3 format.)  Po not run ImageCenter  Command line parameters (optional):  A:\pqimgctr.exel  Can be used to specify a script file and image or other ImageCenter options. Example: /CMD=C:\image.txt /IMG=C:\Images\image.pqi
	< <u>B</u> ack <u>N</u> ext > Cancel

Figure 3



5. The next window allows the appropriate Network Interface Card (NIC) drivers (for the client system) to be selected. Select the **Intel® PRO/100 VE Desktop Adapter** listing. If you do not have this listing, you need to add the drivers to PowerQuest by clicking the **Add** button. For more information on this, please refer to *Adding Network Adapters in PowerQuest* available at <u>http://support.clearcube.com</u>. After selecting the appropriate driver, click **Next**.



Figure 4



- 6. At the next window, specify the client network properties. The two options available are:
- **Obtain an IP address from a DHCP server –** an active DHCP server must be available on the network segment. If a DHCP server is not available, a static IP address must be assigned.
- **Specify an IP address –** this allows assigning a specific IP Address and Subnet Mask to the machine. If this option is chosen, only one machine at a time can use this boot disk or there will be an IP address conflict.

When finished, click Next.

🚪 PowerQuest Boot Disl	s Builder	
BowerQuest Boot Dist Be TowerQuest Be TowerQuest Boot Disk Builder Boot Disk Builder	Specily the client network properties. © globain an IP address from a DHCP server © Specily an IP address IP Address IP Address 192-168-01 Subnet mask: 255-255-255.0	
	< Back	at > Cancel

Figure 5



- 7. The last window provides the option to choose the type of disk to be built. The three options are:
- **Floppy Disk** saves the configuration options selected in previous steps to two 3.5", 1.44MB floppy disks. The first disk contains all of the boot information for the floppy disks. The second contains the ImageCenter application components. If the option to run ImageCenter from a share point was chosen in Step 4, only one disk is needed.
- Copy boot disk contents to a folder saves the configuration options selected in previous steps to a
  directory on the local system or to a shared point. This allows modifications to be made to the files at a
  later time (i.e. logon domain/workgroup, username, autoexec.bat files, etc.).
- Virtual Boot Disk file saves the configurations options selected in previous steps to a Virtual Boot Disk (\*.vfd). This provides the ability to save the configuration as a Pre-eXecution Environment (PXE) boot option, as well as the ability to build a Task to boot client systems with the boot disk.

When finished, click **Finish**. This will begin building the physical or virtual disks. After the build is complete, the first screen of Boot Disk Builder will appear. Choose **Exit**.

🖶 PowerQuest Boot Dis	k Builder	
PowerQuest DeployCenter Boot Disk Builder	Select the type of disk to build. Roppy Disk Select disk drive C A C B. C pop boot disk contents to a folder: C Mitual Boot Disk file Use Beforence Disk for DOS files	
	< Back	Cancel

Figure 6



8. Once the boot disks are built, the next step is to prepare the client system to be imaged. All applications, system service packs, and hot fixes/patches should be installed. Any desired system settings should also be configured. Prepare the system so that it is in the desired state to replicate to other clients.

9. Before creating the image, the system must be prepared for duplication. All application-specific GUIDs (unique identifiers for an application) should be deleted. Please refer to vendor application documentation to determine what if any GUIDs exist. The ClearCube Management Suite contains two applications that have GUIDs that must be deleted, Blade Manager and Management Console. To delete these GUIDs, you will need to run regedit.exe. Access this application by selecting **Start->Run** and entering regedit.

**Note:** Using the regedit utility improperly can cause severe damage to the operating system. Important data should be backed up prior to using the Registry Editor tool.

Run	? 🛛
-	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	regedit 🗸 🗸
	OK Cancel <u>B</u> rowse

Figure 7

- 10. When the Registry Editor tool opens, delete the following keys/values:
- HKEY\_LOCAL\_MACHINE\SOFTWARE\INTEL\LANDesk\Client Manager\CurrentVersion\Application Identifier (Value)
- HKEY\_LOCAL\_MACHINE\SOFTWARE\INTEL\LANDesk\Client Manager\CurrentVersion\GUIDS (Key)
- HKEY LOCAL MACHINE\SOFTWARE\INTEL\LANDesk\Common API\UniqueID (Value)

11. Once these registry entries have been deleted, remove the Microsoft Security Identifiers (SIDs) using the Microsoft Sysprep tool. This tool can be found on Microsoft Operating System CDs as well as at <a href="http://support.microsoft.com">http://support.microsoft.com</a>. There are a number of other tools available, such as PowerQuest's DeployPrep and Symantec's Ghost Walker that can be used as well to remove the SIDs.

12. When SIDs are removed from the client by the Sysprep utility, the system shuts down. At this point, the dormant image holds a trigger that cause new SIDs to be generated when the system boots up. If the machine boots back into Windows before saving the image, it will re-generate the SID and GUIDs that were deleted in Steps 11–13.

13. Boot to the Microsoft TCP/IP Boot Disks created earlier. When booting, physical floppies or the PXE server must be used. Virtual floppy disks cannot be used for this process via the Task Builder method.



14. When the system boots, if the option was not chosen to run ImageCenter automatically, launch ImageCenter manually.

15. When Image Center opens, select **Create Image**. Since Caldera DOS (the version of DOS used by PowerQuest) does not support USB mice, only the keyboard can be used.



Figure 8



16. On the next screen, choose the partitions to be included in the image file. Check the boxes to the left of the partitions that should be included in the image file. When finished, click **Next**.

Creatin	ng an l	mage						2
Selec	ct Sou	rce Part	itions					
Select	t the par	titions to in	clude in the image file	-				
C: 4,118	: 1 - 822 3.2 MB A	со мв —— Active FAT3	32		D:APPS 4,102.5 MB FA1	F32		
Disk	Letter	Label	Type	Status	Size MB	Used MB Ur	nused MB	Pri/Log
	C:		FAT32	Active	4,118.2	1,217.6	2,900.5	Primary
<b>I</b> 1	$\frac{\partial \mathcal{L}}{\partial \mathcal{L}}$		🔦 Extended	None	4,102.5	4,102.5	0.0	Primary
	D:	APPS	🔌 FAT32	None	4,102.5	200.6	3,901.9	Logical
Se	elect <u>A</u> ll		Select Non <u>e</u>					
	Help				< <u>B</u> ack	∐ext>		Cancel

Figure 9



17. In the Name Image File window, identify the name of the image file and choose the location where it should be saved. Enter the path or click on the **Browse** button to select the location.

Creating an Image		×
	Name Image File	
nter	Enter the image filename, specifying the drive and directory. For example: D:\MYIMAGE.PQI. Click Browse to browse the directory tree for the path and filename.	_
ů	Image File: [#.FU] Browse	
est OV ente	Image File Co <u>m</u> mente:	_
PowerQu Depl ImageC		•
		-
Help	<back next=""> Cancel</back>	

Figure 10 Name Image Flle Window

18. On the following screen, select the drive that was mapped to a network share in Step 3, which is the target location, and name the image file. ImageCenter will return to the Name Image File window (shown in *Figure 10*), which now contains the location and image file name. It is strongly suggested that the comments field be utilized to provide information about the image such as Operating System, Service Packs, Applications, etc. in the field. When finished, click **Next**.



19. In the Compress Image File window select the compression to apply to the image file that you're creating. It is highly recommended that the image file be compressed. Click **Next** when finished.

Creating an Image			×
	Compress Image File		
PowerQuest DeployCenter ImageCenter	Select the level of compression No Compression Low High Selection Information: Low compression offers a 400 If saving the image file to a ne compression can be faster the Note: The sizes listed are only of will vary depending on how we	for the image file below. 1196.0 MB 714.0 MB 598.0 MB & average compression ratio. etwork drive or removable media device, low an no compression. estimates. The actual size for compressed image estimates. The actual size for compressed image	15
Help	<	Back Next> Cancel	

Figure 11 Compress Image File Window



20. The next window provides a summary of the options selected in previous steps. Review the information in the window. Further options can be added by clicking on the **Advanced Options** button. This provides ability to:

- Split the image file into multiple files (e.g., to burn to CDs).
- Password protect the image file neither ClearCube nor PowerQuest can provide "back door" passwords in the event an image file password is lost.
- Disable system error-checking or smartsector copying.
- Verify the integrity of the image file after it's created.
- Verify disk writes.

Crealing an Image	X
	Ready to Create Image File
2	Review your selections. Click Back to change selections. Click Finish to create image file.
PowerQuest DeployCenter ImageCenter	Source Drives: Disk 1- 8220 MB Source Partitions: [X] C: FAT32 [] *: Extended [] D: APPS FAT32 Image File: F:\WIN98-2.PQI Compression Level: Low
Help	< Back Einish Cancel

Figure 12 Creating an Image Window

21. After reviewing all of the options, and approving the selections, select **Finish** to begin the imaging process.



22. The next window will show the status of the imaging process.

Creatin	g the Image						
lmage F	ile: <a>N&lt;</a> .	NIMAGE.PQI					
		Estimated MB to C	copy:	204.5 MB	(Comp	ression Leve	el: High)
	2	Total MB Copied:		43.3 MB			
	e	Entire Progress	•				
	t	26%					
	e			Current Partition:	(2 of 2)		
	U	Valume	Туре		Size MB	Used MB L	Jnused MB
st	∧ <sup>t</sup>	D:APPS	FAT32		4,102.5	202.5	3,899.9
Que		Copving data					
/er(	La e	27%					
Pow	ĎĚ	Transfer Rate for (	Current F	Partition:		54 MB/	min
		Total MB Copied fo	oi Cuirei	nt Partition:		41.7 MB	
Time Cla							
Estimate	apsect uu:uu:49 ed Time Remaining:	00:02:19					
							<u>C</u> ancel

Figure 13 Status of the Imaging Process

23. When completed, exit and reboot the system. When the computer boots into Windows, it will require registration of specific points (e.g., Serial Number, Computer Name). The specific points to register depend on the options used in the sysprep.inf file during the Sysprep process.

24. When the image file has been successfully created, it can then be distributed it to as many systems as there are available licenses for.



## TROUBLESHOOTING

- 1. When I boot to the Microsoft TCP/IP Boot Disks, I get a network error.
  - Make sure that if DHCP was selected as the method for obtaining an IP address, the system can communicate with the DHCP server.
  - Make sure that the DHCP server has available IP addresses.
  - Make sure that the authentication information entered in the Authentication portion of the Boot Disk (Step 3) is correct for the share point you created.
  - Make sure that the Blade is connected to a network cable, which is then connected to the network infrastructure.
- 2. When I try to image my computer, I get an "Out of Space" error.
  - Make sure that the network share point has enough disk space to accommodate the image files. If there is not enough space, make space by deleting/moving files or by selecting an alternate share point.
  - If the image file was not compressed, select a higher compression level (e.g., 50%).
- 3. When I try to boot to a Microsoft TCP/IP Boot Disk loaded into PXE, I get an error reading the VFD.
  - When the VFD was loaded for the Microsoft TCP/IP Boot Disk into PXE, it cannot be 2.88MB. Recreate the boot disk and choose to load ImageCenter from a share point (Step 4).

## ADDITIONAL INFORMATION

There are various methods for restoring an image, which include:

- Running ImageCenter again and choosing Restore Image instead of Create Image.
- Executing a network boot to a PXE server.
- Using a physical or virtual floppy to reboot into a PowerCast session.

For more information, please contact ClearCube technical support.

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