

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

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## OVERVIEW / ENVIRONMENT

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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.

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## DETAILED DESCRIPTION

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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 <http://support.microsoft.com> .

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**.

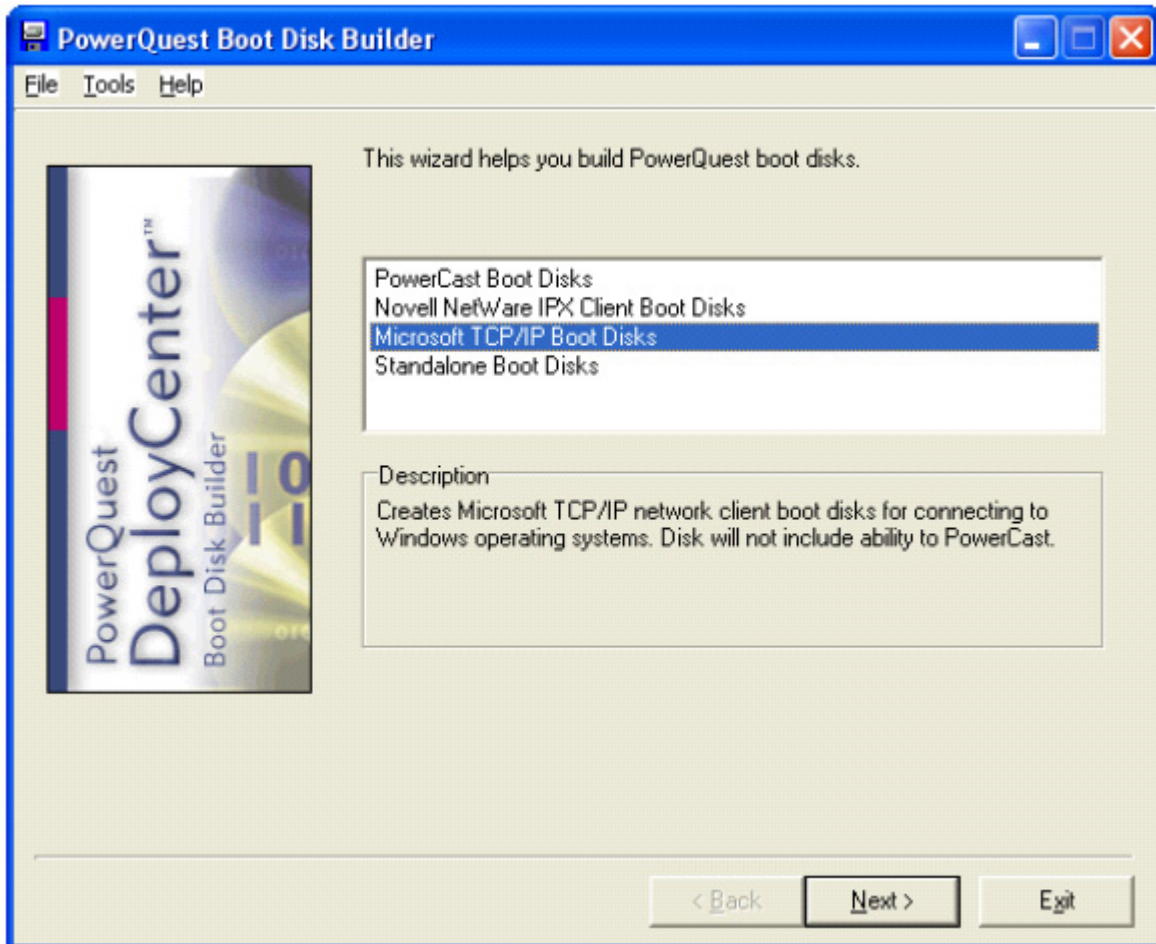


Figure 1

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**.

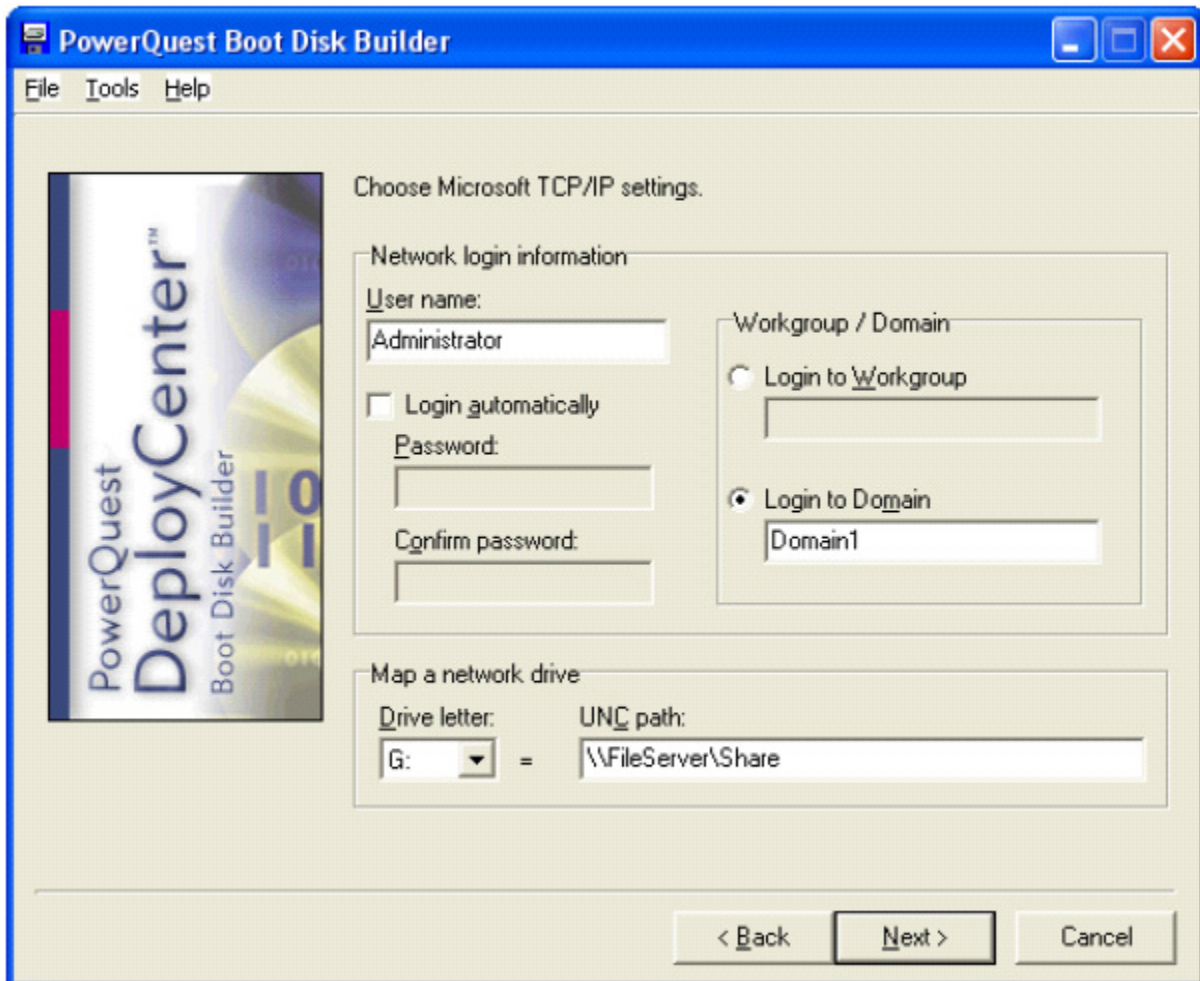


Figure 2

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 `autoexec.bat` 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**.

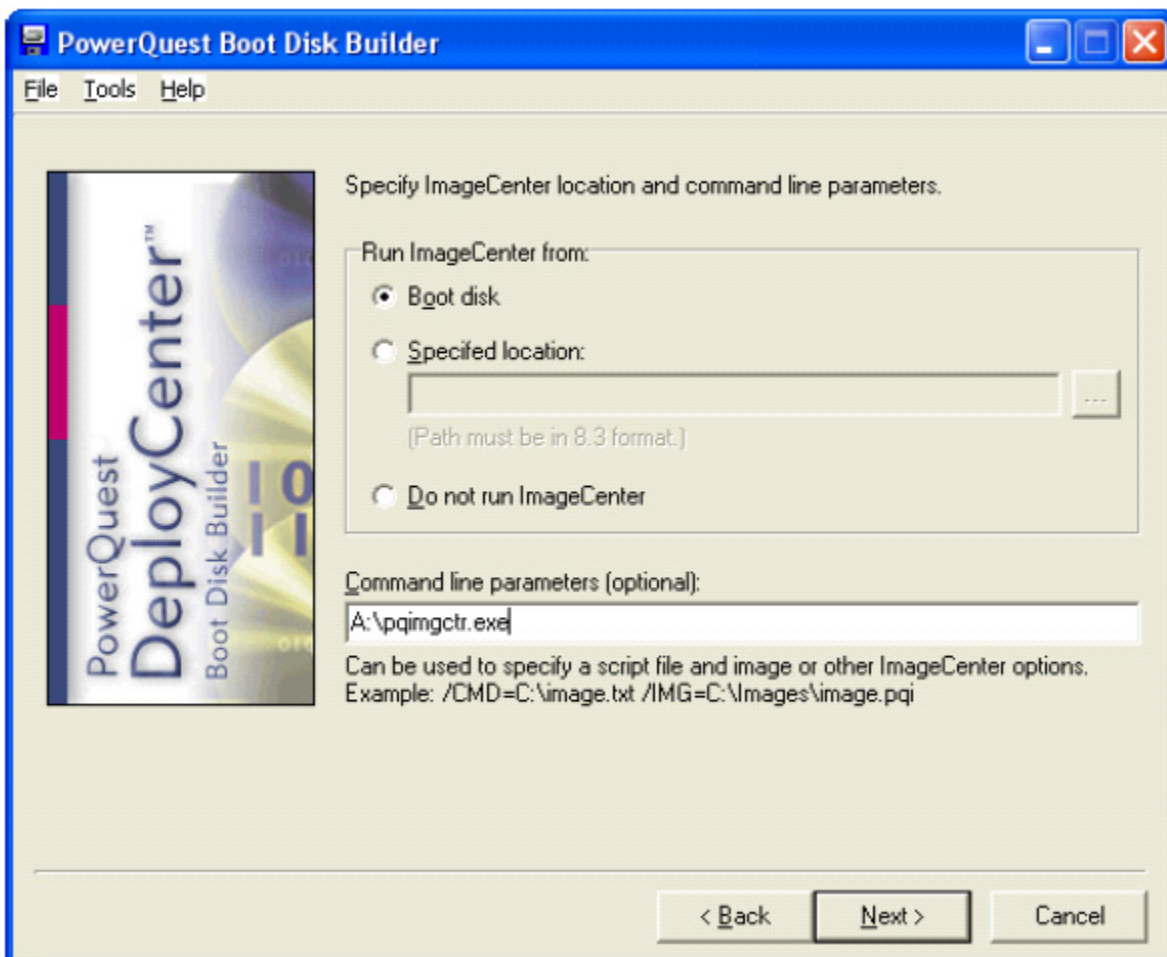


Figure 3

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 <http://support.clearcube.com>. After selecting the appropriate driver, click **Next**.

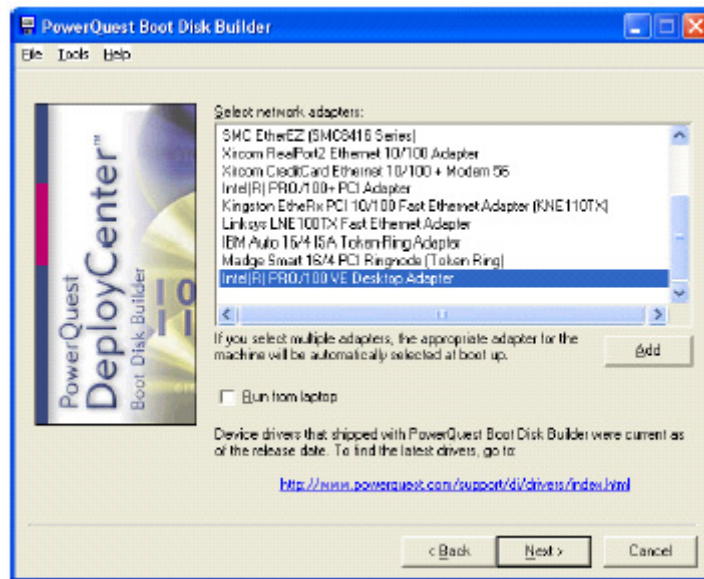


Figure 4

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**.

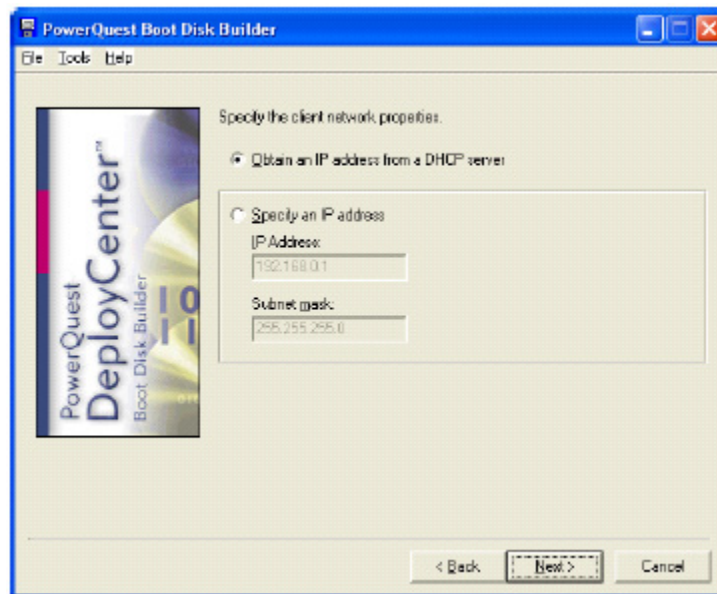


Figure 5



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**.

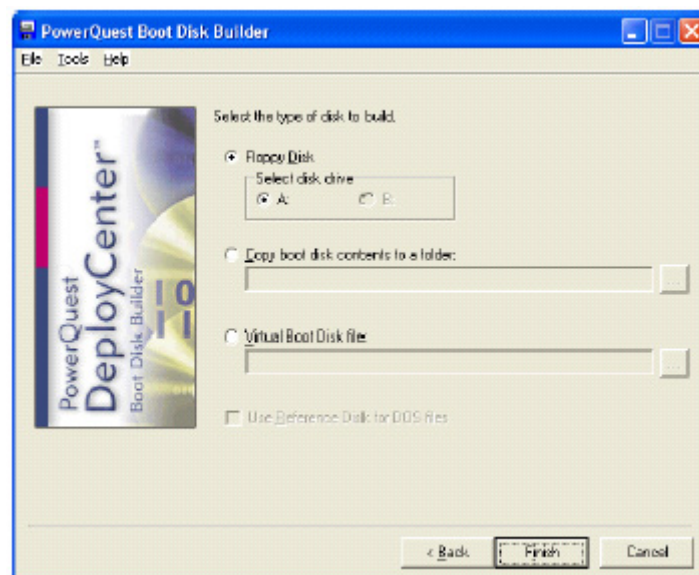


Figure 6

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.

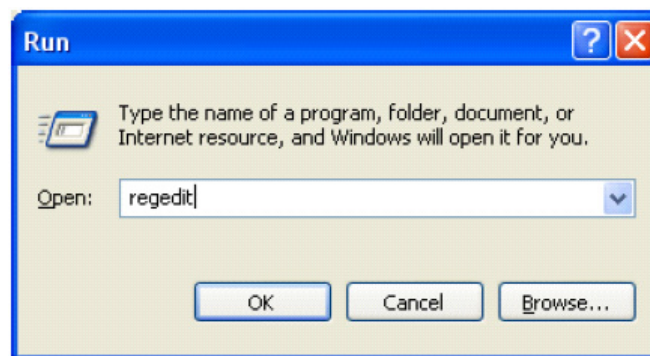


Figure 7

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 <http://support.microsoft.com>. 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.

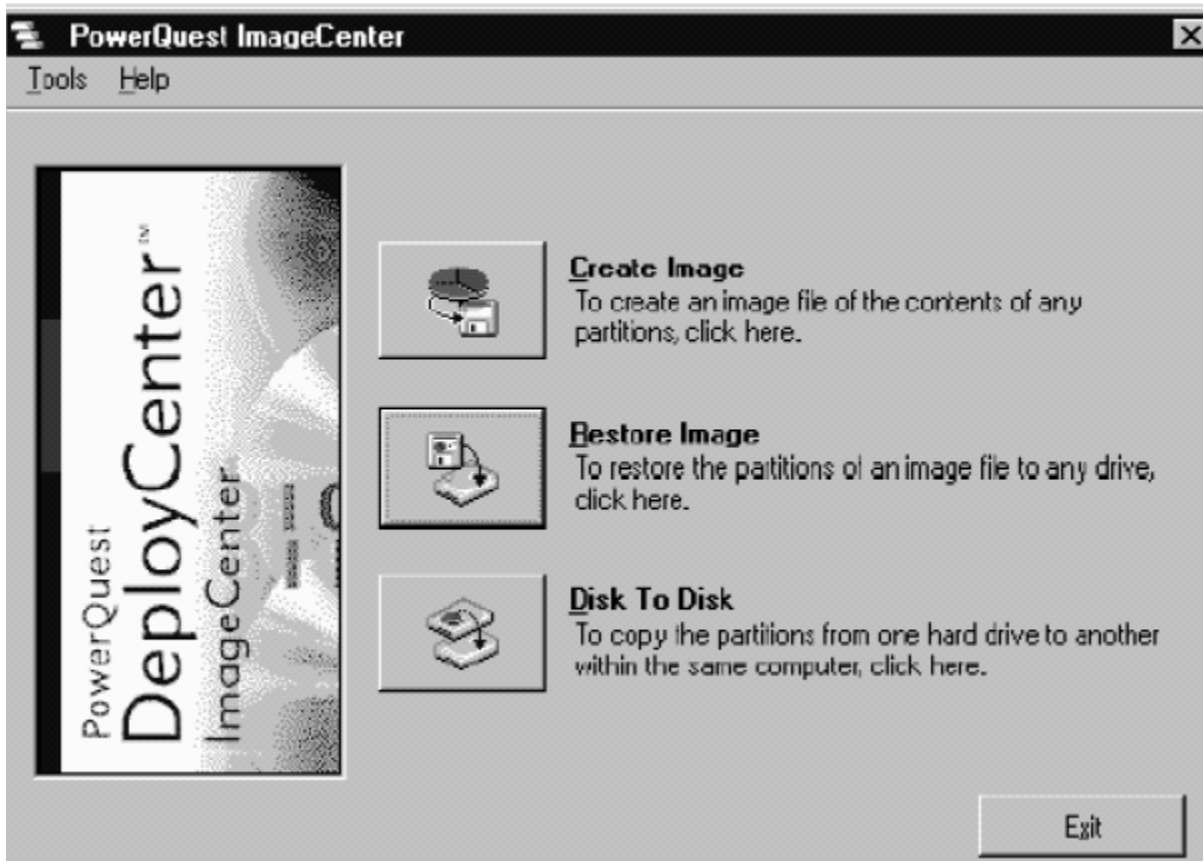


Figure 8

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**.

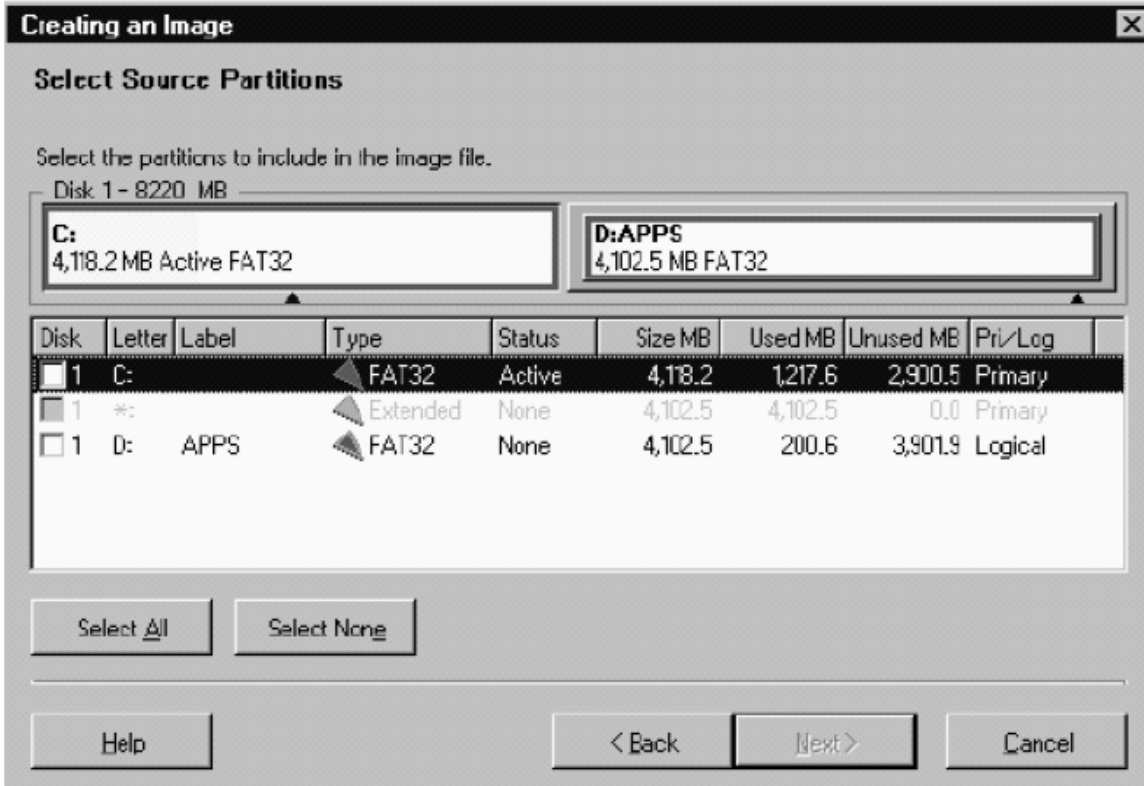
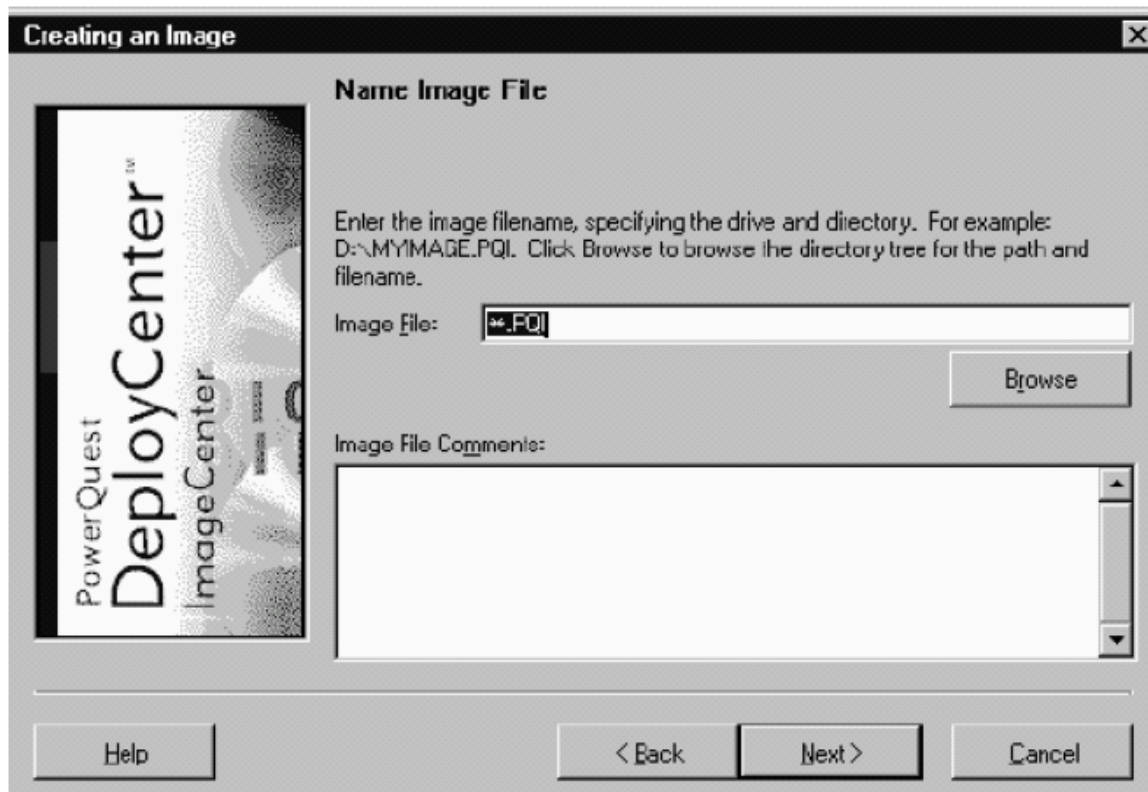


Figure 9

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.



*Figure 10 Name Image File 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.

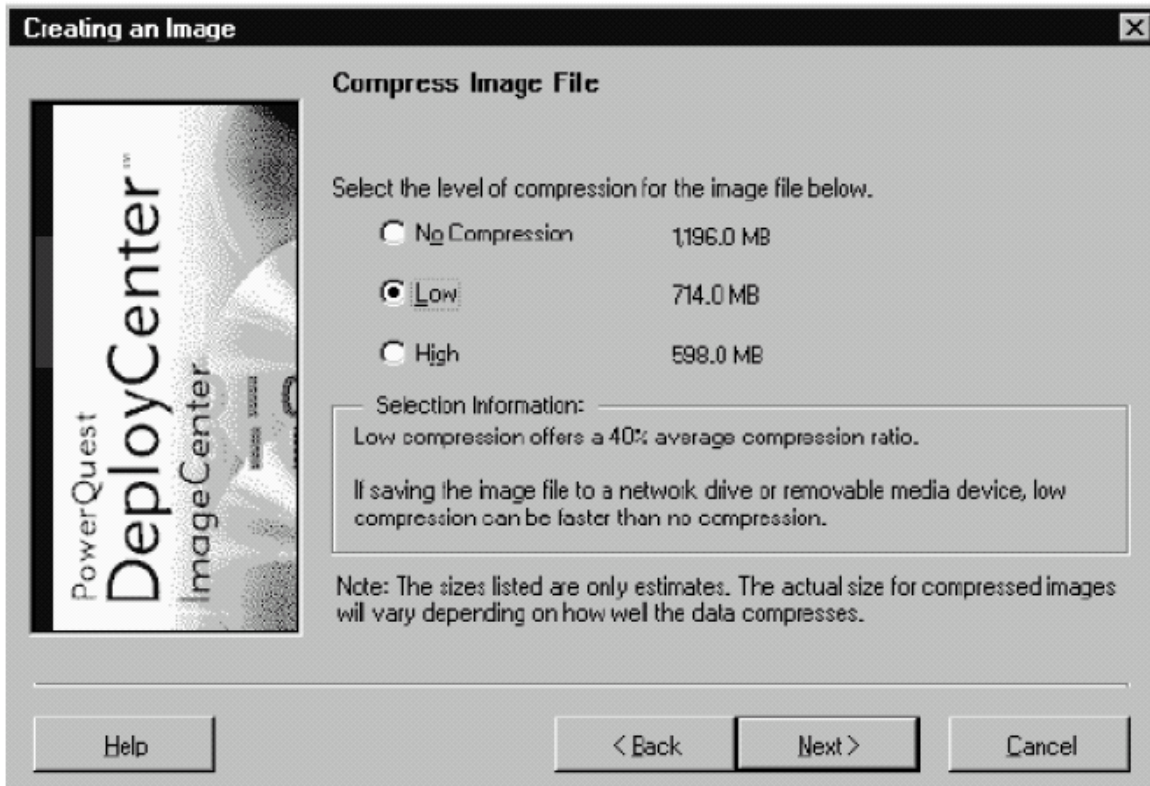


Figure 11 Compress Image File Window

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.

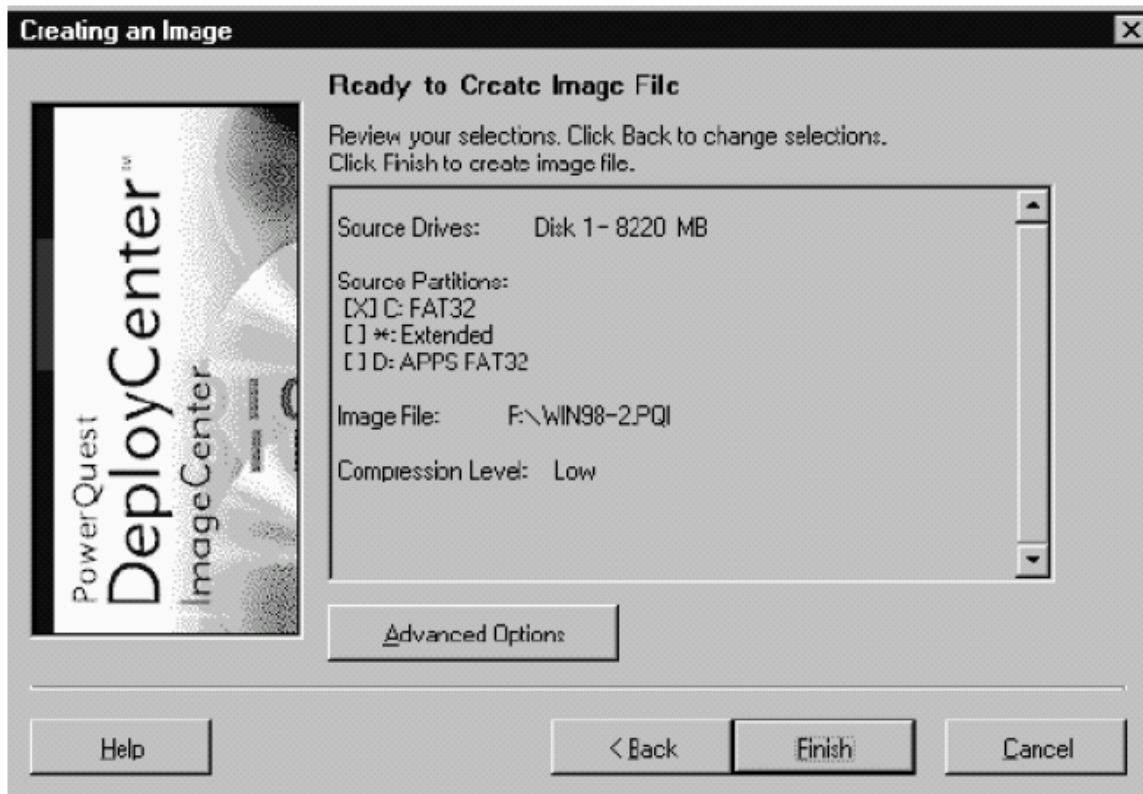
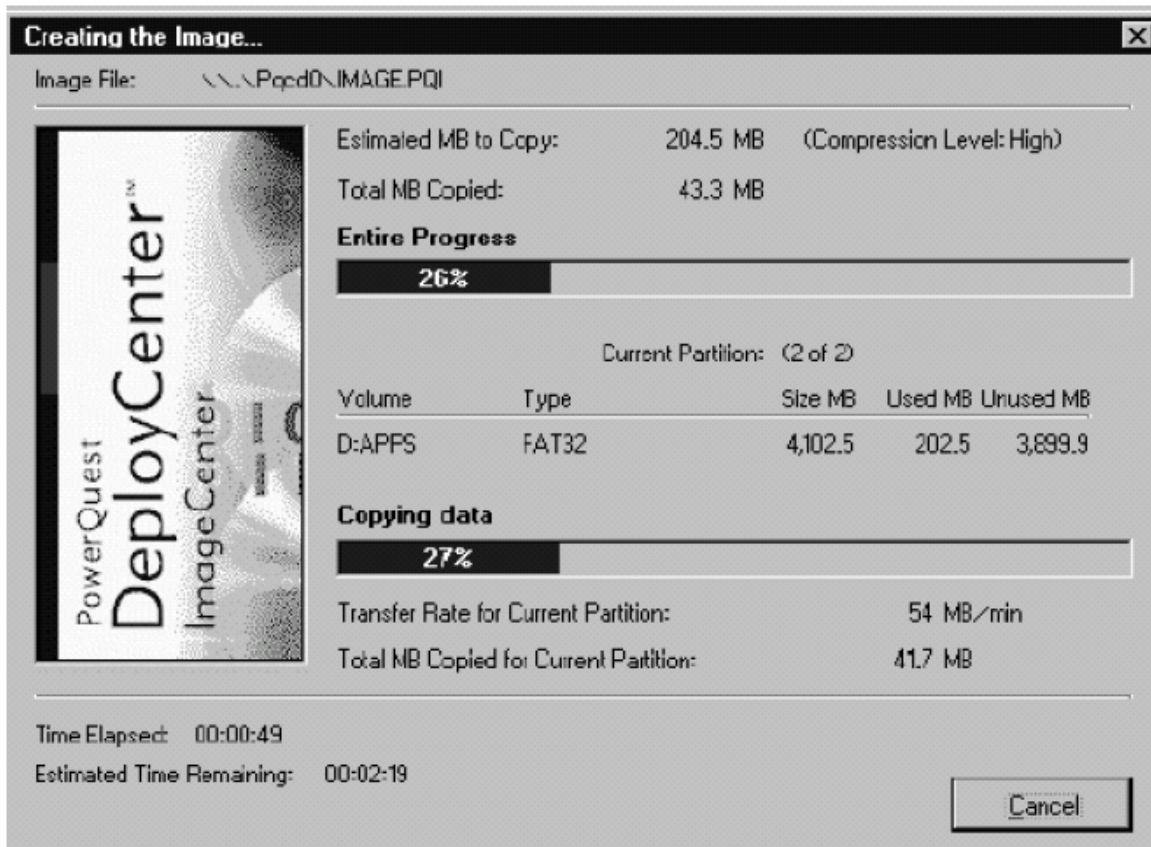


Figure 12 Creating an Image Window

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.



*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.



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## TROUBLESHOOTING

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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).

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## ADDITIONAL INFORMATION

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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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