DeployStudio Lion Supplement

Version
1.0

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Overview

Please note: this guide is intended to be a resource for building and deploying images using DeployStudio. The author assumes no responsibility for lost time or lost data when using the tools described in this guide. **DeployStudio is intended to partition and re-image systems and, when configured as such, will erase all data on the drive.** It is important to understand this capability as it can cause automated, unrecoverable data erasure, depending on the chosen, configured deployment.

The author of this guide has no affiliation with the developers of DeployStudio. Third-party company and product names mentioned herein are trademarks of their respective companies. Mention of third-party products is for information purposes only and constitutes neither an endorsement nor a recommendation to use those products. The author assumes no responsibility with regard to the performance of these products.

When seeking support for DeployStudio Server, please consult the DeployStudio forums. It is recommended you first search for the issue you're experiencing. If you cannot find the answer you're looking for, post the question to the forum. The forum may be found here:

http://www.deploystudio.com/Forums/index.php

The testing and development of this supplement was done using Snow Leopard Server 10.6.8 and Lion Server 10.7.1 in conjunction with Mac OS X v10.7.1 client. DeployStudio v1.0rc128 was used to test these features in conjunction with both server versions.

For extensive details regarding DeployStudio and setting up a DeployStudio Server using a Snow Leopard Server as the host OS download the latest DeployStudio Guide (as of this writing version 2.0):

http://web.me.com/driley/web/deploystudio_files/DeployStudio_Guide.pdf

The purpose of this guide, the DeployStudio Lion Supplement, is to showcase the minor differences and nuances for deploying Lion client from a Snow Leopard or Lion Server.

Before preparing to deploy Mac OS X Lion to Mac client systems verify those systems have met the minimum requirements specified by Apple:

http://www.apple.com/macosx/specs.html

Chapter 1 - Lion, What's New

This chapter covers a few points necessary when installing, preparing and deploying Lion client images. It is not intended to be a comprehensive look at the Recovery HD or licensing as it pertains to legal details when purchasing, deploying and using various software titles. Apple offers detailed information on these topics on their web site.

Recovery HD

Mac OS X v10.7 Lion and Mac OS X Server 10.7 Lion Server introduce a number of new features. In regards to deployment, a number of features have been added or enhanced in both the operating system and in DeployStudio to take advantage of this. First, Mac OS X is no longer distributed on DVD media and therefore must be downloaded. A DVD or external USB, FireWire or Thunderbolt drive may be used to host the Lion install media as well. Similar to previous versions of Mac OS X, a Lion install disk can be created or the Recovery HD partition may be used, which includes the following features:
- Restore From Time Machine Backup
- Reinstall Mac OS X
- Disk Utility
- Firmware Password Utility
- Network Utility
- Terminal
- Startup Disk
- Reset Password

Note: Reset Password is accessed using Terminal first. To access this go to Utilities > Terminal, type *resetpassword* and return. The Reset Password.app will launch and passwords for unlocked partitions may be reset.

Note: Lion adds support for FileVault 2 which offers full disk encryption. When full disk encryption is enabled, launch Disk Utility while running from the Recovery HD, click on the drive and enter the password for the drive to access it. Many of the above features cannot access the drive until it has been unlocked and mounted.

Lion also supports the ability to Get Help Online, which utilizes Safari (without plug-in support).

Further details may be found here:

http://www.apple.com/macosx/recovery/

To access the Recovery HD partition hold down the Option key and select Recovery HD during the boot sequence or hold down Command-R during the start up process.

The Recovery HD partition does not mount when Mac OS X is running. Similarly it is not a visible partition in Disk Utility. It may be viewed, however, from Terminal by running the following command: *diskutil list*

Create a bootable Lion DVD or Disk

To create a bootable Lion DVD follow these steps:
1. Purchase and download Mac OS X Lion.
2. Launch Disk Utility located in /Applications/Utilities/.
3. In /Applications/ right-click on the Install Mac OS X Lion.app.
4. Choose Show Package Contents
5. Navigate to /Contents/SharedSupport/InstallESD.dmg.
6. Drag this file to Disk Utility below the other mounted drives.
7. Select the InstallESD.dmg in Disk Utility and either choose Burn to create DVD media or Restore, to restore the Mac OS X Lion installer to an external drive.

Note: If Install Mac OS X Lion.app was already run to upgrade the host system it must be downloaded again. Simply launch the Mac App Store and either choose INSTALL or UPDATE or Option-Click on the INSTALL button.

Apple does offer the OS X Lion USB Thumb Drive but this is not necessary for most users with decent bandwidth. Further details regarding the features, capability and cost for the OS X Lion USB Thumb Drive may be found here:

http://store.apple.com/us/product/MD256Z/A

Apple also offers the Recovery Disk Assistant, a free download, which will create an external drive equivalent of the Recovery HD partition. This is not the full installer but does include the tools mentioned above that are available in the Recovery HD partition. Lion may be re-downloaded using an Apple ID that was used to purchase the software initially. No additional charges are incurred to download the software again. To access the Recovery Disk Assistant software from Apple visit:

http://support.apple.com/kb/DL1433

To learn more about the Recovery Disk Assistant software visit:

http://support.apple.com/kb/HT4848

Licensing and Apple ID

IMPORTANT: In order to install Mac OS X Lion on other systems the Apple license agreement for Mac OS X Lion and Lion server must be followed. In an organization every system must be licensed to run the software. To install Lion on multiple systems an Apple ID is not required on those other systems in order to install the software. To learn more visit the Deploying OS X Lion section on this site:

http://www.apple.com/mac/volume-licensing/

Similarly, licensed copies of Apple software, other than Mac OS X, may be deployed to multiple systems as well. To learn more about the specifics of this visit this site:

http://support.apple.com/kb/HT4781

Note: Apple software deployed within an image that was purchased using the Apple Software Volume Licensing program, where each client machine does not have the software installed using a separate Apple ID will not be able to update the software using pre-Lion methods. That is to say software updates in Lion for most Apple software titles, with the exception of Mac OS X, are updated using the Mac App Store, not Software Update. Software may be downloaded on the primary system using an Apple ID and then distributed to the licensed clients. The software must be licensed to run on the other systems.

Chapter 2 - Mac OS X Server

This chapter points out the new configuration settings for Lion Server. Full details regarding settings that are identical for DNS, DHCP, Open Directory and NetBoot configuration for both Snow Leopard Server and Lion Server may be found in the DeployStudio Guide.

Lion Server

Lion Server made some major changes to the features and configuration of the server. Lion Server is now available as an add-on Mac App Store exclusive installation. Alternatively, all new server configurations from Apple have Lion Server pre-installed. To install Lion Server or upgrade from Snow Leopard Server administrators must purchase, download and install Lion client and Lion Server. Lion Server includes a number of changes to the configuration applications used when setting up the server. Server.app is the primary application located in the /Applications/ directory. Server Admin is no longer installed with the server but is available as a free, separate download from here:

http://support.apple.com/kb/DL1419

Note: Make sure the Server Admin version is current for the version of Mac OS X Server being used. The link above offers the 10.7.0 version of Server Admin, which works with Lion Server version 10.7.0 and 10.7.1.

Server Admin is required to modify the graphical user interface for services including DNS, DHCP, Open Directory and NetBoot Settings and images, very similar to the way Snow Leopard Server was configured using Server Admin.

Note: Updating a Snow Leopard Server to Lion Server, using the Lion and Lion Server installs, should keep previous DeployStudio installs intact. Administrators should upgrade to DeployStudio Server 1.0rc128 over the previous installation. After upgrading, verify that the DNS settings continue to work properly using nslookup or changeip (described in the DeployStudio Guide).

Snow Leopard Server vs. Lion Server

Deploying Mac OS X Lion client may be done from a Snow Leopard or Lion Server. Newer machines must NetBoot using the version of Mac OS X or a newer version of Mac OS X that is supported by that system. Systems that ship with Lion must first be NetBooted using Lion and then must have Lion deployed to them. Further details of the specifics of this may be found here:

http://support.apple.com/kb/HT2186

Snow Leopard Server can host Leopard, Snow Leopard and Lion NetBoot images. These images must be created on a system running the relevant version of the OS. For

example, when re-imaging a mid-2011 Mac mini a Lion NetBoot image must be used and a Lion image must be deployed to the system. Using the DeployStudio Assistant to create a NetBoot image on a Snow Leopard Server will not properly boot the Mac mini mid-2011 system. Copy or install the DeployStudio software to the Mac mini client, create the image, then copy the image(s) back to the server.

To clarify a variety of scenarios can be used to host and deploy client images:
1. Lion Server can host Leopard, Snow Leopard and Lion NetBoot images. DeployStudio on Lion Server can also deploy images for Leopard, Snow Leopard and Lion clients.
2. Snow Leopard Server can host Leopard, Snow Leopard and Lion NetBoot images. DeployStudio on Snow Leopard Server can also deploy images for Leopard, Snow Leopard and Lion clients.

In other words, the server version of Mac OS X can host a variety of generations of operating system NetBoot images. Lion Server is not required to host current and older images. Those images, however, must be created on the client systems. Versions of DeployStudio Server v1.0rc128 should not, and in some cases can not be used to deploy the latest version of Mac OS X. Simply download and install the latest version of DeployStudio to build and deploy images.

Note: Leopard Server running on PowerPC or Intel hardware was not tested for the purposes of this guide but should also work in the above mentioned scenarios.

Setting up DeployStudio Server on Lion Server

When setting up DeployStudio Server for the first time on Lion Server there will be differences between the DeployStudio Guide 2.0, which configures Snow Leopard Server. Some of the steps to set up Lion Server are different. This is primarily due to the fact that file sharing is now handled by Server.app, not Server Admin.app as it was handled in Snow Leopard. Similarly users were created using Workgroup Manager and may now be created using Server.app As noted previously, Lion continues to use Server Admin.app to configure and modify DNS, DHCP, Open Directory and NetBoot. Lion does not include Server Admin.app by default but it may be downloaded for free from here:

http://support.apple.com/kb/DL1419

When setting up a private network environment follow the steps in the DeployStudio Admin guide for configuring DNS, DHCP, Open Directory and NetBoot described in the full guide.

To configure users and the DeployStudio repository share point in Lion Server follow these steps:
1. Launch Server.app located in /Applications/.
2. Select Users.

3. Click the "+" button.
4. Add the users Full Name: (i.e., DeployStudio Admin), Account Name: (i.e., dsadmin), and then enter the users password and verify it. Leave Allow user to administer this server unchecked.
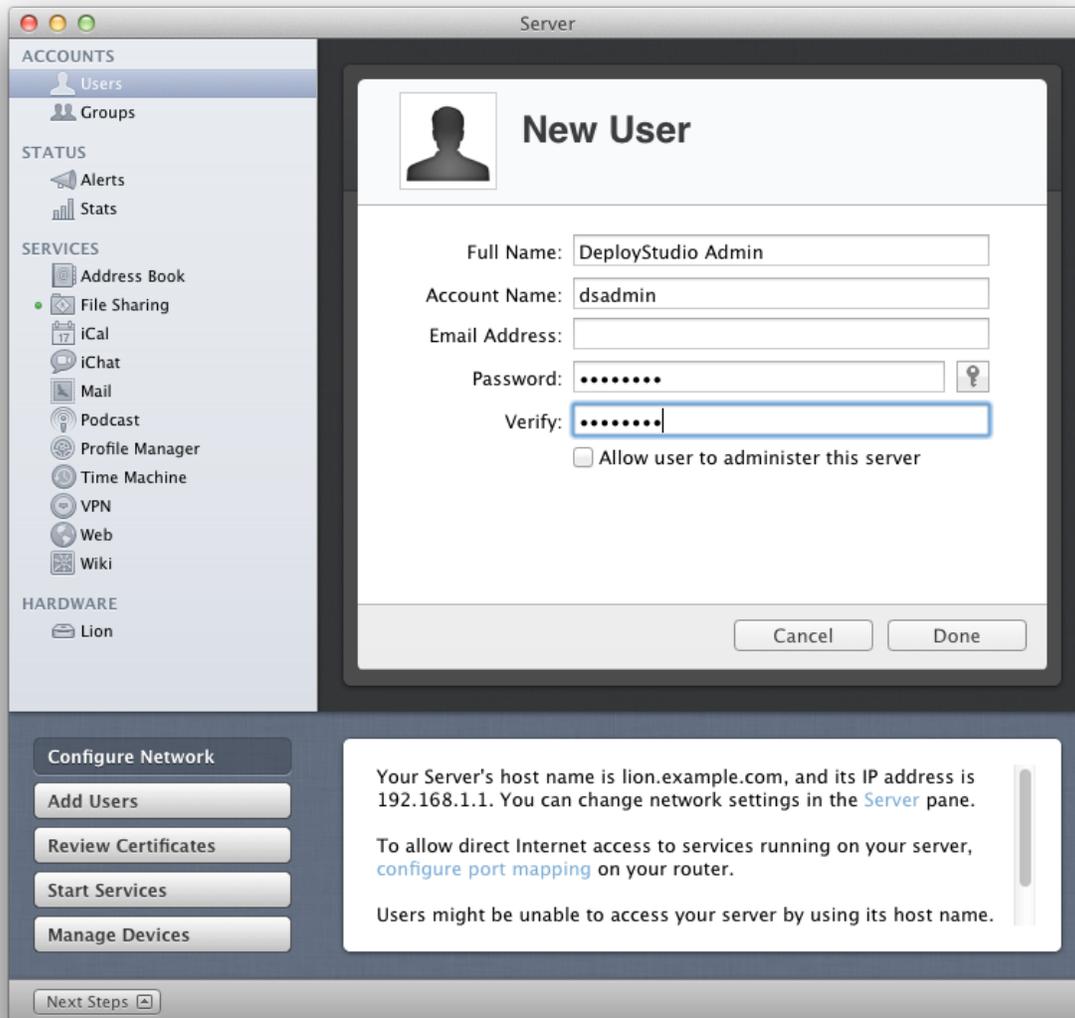
5. Select File Sharing.
6. Select Public.
7. Click the pencil icon.
8. Click the "+" button and type "dsadmin" then select the DeployStudio Admin user from the list.
9. Verify the user has Read & Write access to the share.
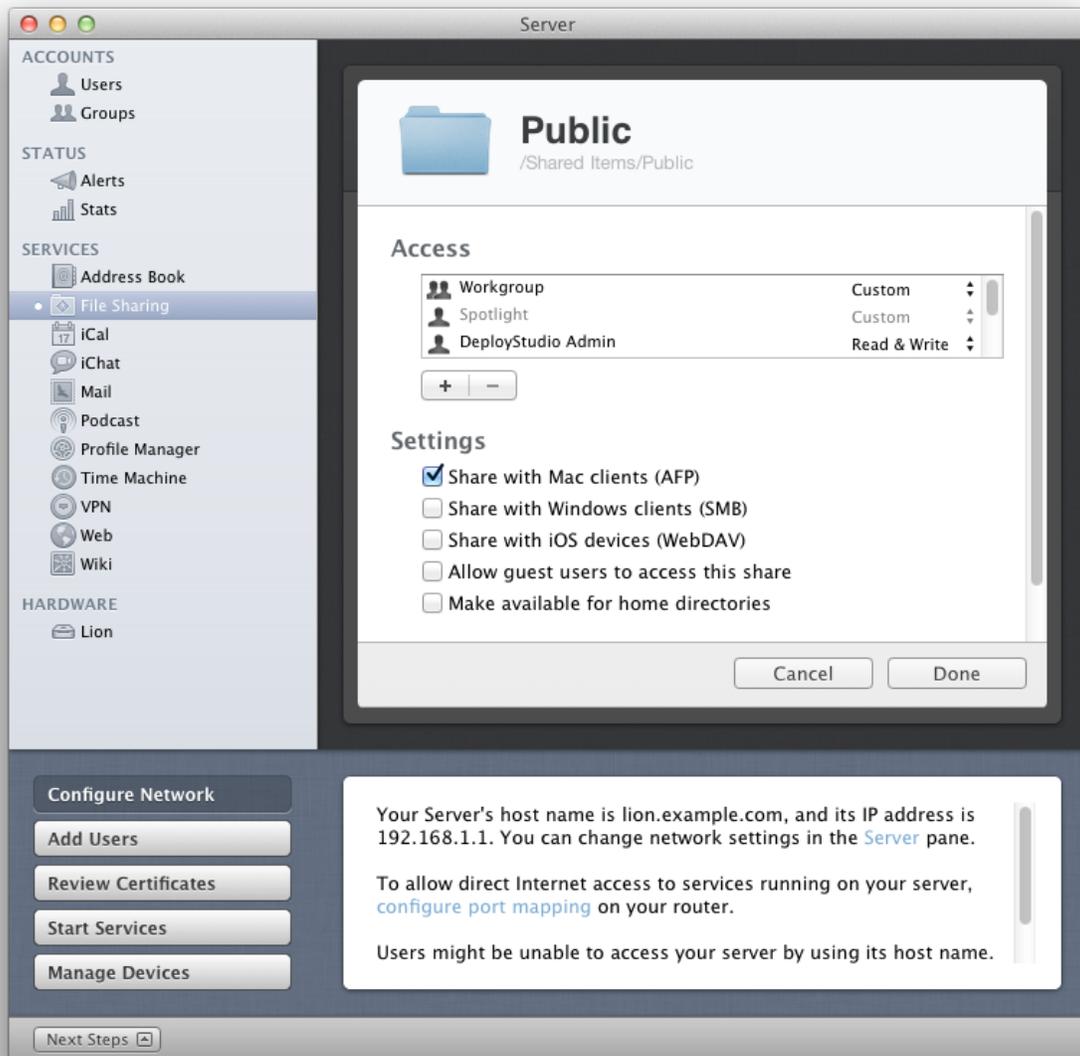
Note: If permissions issues come up, propagate permissions resolve the problem. In Lion follow these steps to propagate permissions.
1. Launch Server.app.
2. Under HARDWARE select the server.
3. Select the Storage tab.
4. Turn the icon for the drive the share point is located on.
5. Select the share.
6. Choose Propagate Permissions... from the gear icon.

Chapter 3 - DeployStudio Admin

Creating Lion Images

This chapter only points out the differences when creating and deploying Lion master images. Full details regarding using DeployStudio Server Workflows should reference the DeployStudio Guide.

A few changes were made to DeployStudio Server to compensate for the new capabilities in Lion. First, when the Image a volume Image task is used to create a Mac OS X Lion image, DeployStudio automatically checks for, recognizes and creates the Recovery HD partition. After the image is created, within the DeployStudio repository will be the primary Lion Mac disk image ending in ".hfs.dmg". A second disk image ending in ".recovery.dmg" will reside in the directory as well. DeployStudio administrators do not need to do anything additional to create the Recovery HD partition. Similarly, in the DeployStudio Admin interface under MASTERS, the Recovery HD partition will not appear. This helps avoid confusion as to which image is master image and which image is the Recovery HD image.

Note: If the master computer used to create the master image has a Recovery HD partition, there is no easy way to force DeployStudio to NOT create the image. Simply delete the image from the repository after the image creation process is completed. All standard installs of Lion and all factory installs of Lion include the Recovery HD partition.

Deploying Lion Images

Deploying a Lion client image with the Recovery HD intact using a DeployStudio workflow is simple. Using the Restore a disk image - Restore task now offers the option for "Restore system recovery partitions". This option is checked by default.
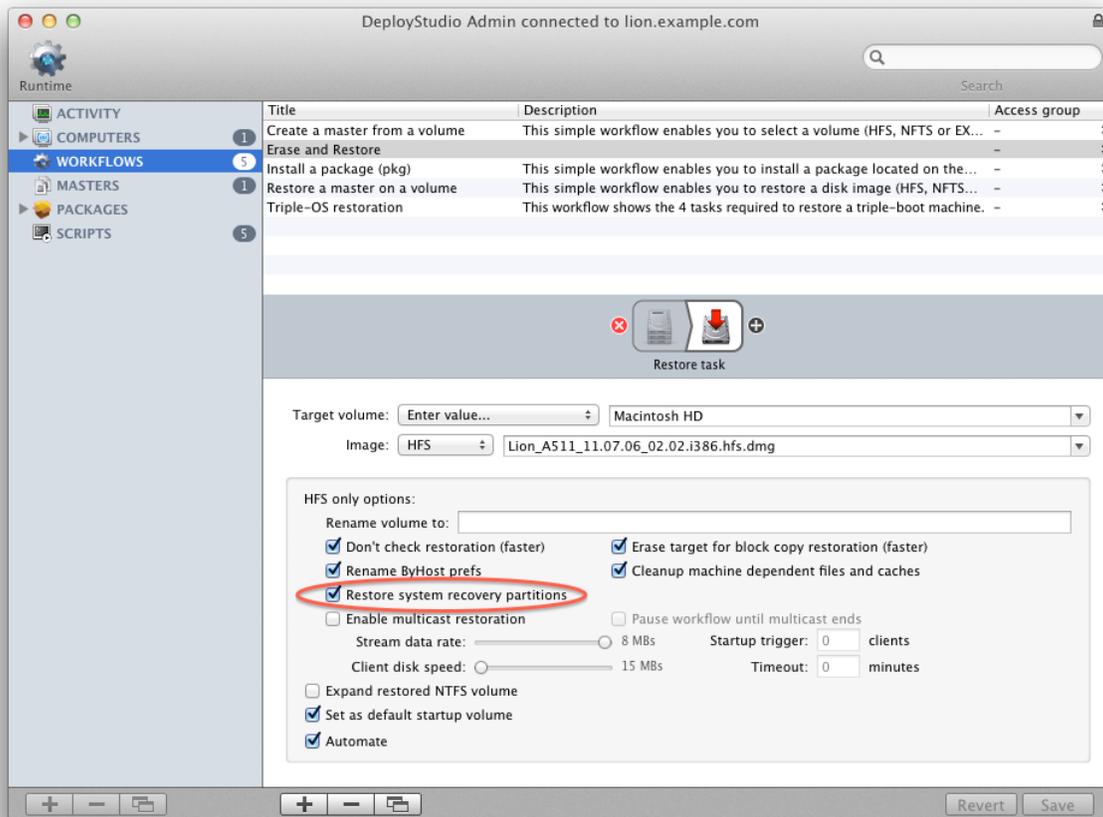
Note: In a scenario where the Macs will be accessed in an open environment (i.e., a computer lab) restoring the systems without the Recovery HD may be optimal. Users will not be able to access the Recovery HD partition holding down either the Option or the Command-R keys to access the Recovery HD capabilities, if the partition is omitted.

Chapter 4 - Windows Deployments

Windows deployments work the same as they did previously using DeployStudio. With that said, however, Apple only specifically supports installing Windows 7 using the drivers included with Lion. Lion handles the Windows support software for Mac differently than in the past. With Leopard and Snow Leopard Apple included the Windows drivers on the Mac OS X Install DVD. Because Lion does not use DVD media the drivers must be downloaded for the particular system(s) and either burned on a disk or copied to an external drive. Fortunately, the Boot Camp Assistant takes care of this for the user.

When using or upgrading older systems that support previous versions of Windows including Windows XP or Windows Vista, if desired, those older systems may continue to utilize those previous versions. This requires using the Windows drivers that came with the earlier, licensed version of Mac OS X. Installing Lion should not render the Windows partition unusable. The Boot Camp Assistant in Lion will not download the drivers for those older systems. Administrators may continue to use the Leopard or Snow Leopard media to install and configure earlier instances of Windows. Apple stopped shipping Windows drivers on newer hardware for Windows XP and Windows Vista in early 2010. Using the Boot Camp Assistant in Lion, administrators can configure Windows 7 on any system that supports both Mac OS X Lion and Windows 7. Details regarding which systems support and offer drivers for Windows 7 may be found here:

http://support.apple.com/kb/HT3986

Note: Windows requires a BIOS to boot properly on Apple hardware Apple's implementation of the BIOS is accomplished using an EFI a plug in. The BIOS plug-in requires that Windows be the last partition installed of 4 partitions. Mac OS X Lion now uses 3 partitions by default including EFI, the primary Mac partition and the Recovery HD partition. When using more than 2 OSes on the same hardware be sure to recognize that Windows must be the last of the first 4 partitions. When creating a triple-boot system which includes Windows the partitions should look like this:
1. EFI
2. Macintosh HD
3. Recovery HD
4. BOOTCAMP
5. Linux

This is discussed in more detail in the DeployStudio Guide.

Appendix A - Troubleshooting

The DeployStudio Guide includes these and many other tips for troubleshooting. Refer to the DeployStudio Guide or the DeployStudio Forums for detailed troubleshooting steps.

Problem:	Possible Solution:
System will not NetBoot	Be sure to create the NetBoot set using DeployStudio Assistant on the client system that will be NetBooting for the most accurate image. Do not create the NetBoot Set on a Snow Leopard Server to boot a system that shipped with Lion.
System will not connect to the DeployStudio Repository	Make sure the latest version of DeployStudio is running on the server. DeployStudio v1.0rc127 was the first version capable of deploying Lion images.