White Paper

Altiris Scripted OS Deployment: Microsoft Windows 2008 and Cisco UCS C-Series Rack Servers Firmware Release 1.4.6

What You Will Learn

This document describes the process for preparing, configuring, and running a scripted installation of Microsoft Windows 2008 on standalone Cisco UCS® C-Series Rack Servers (Firmware Release 1.4.6) using Altiris Deployment Server 6.9 SP5.

This document discusses the following topics:

- Prerequisites for this document
- Creating a driver repository (DriverDB folder; for use in Altiris scripted OS deployments of Microsoft Windows 2008)
- Creating the scripted OS deployment job in Altiris Deployment Server 6.9 SP5 (includes required changes to the unattend.xml file to use the newly created DriverDB folder)

Prerequisites for This Document

- Altiris Deployment Server version
  - Altiris Deployment Solution 6.9 SP5
  - Altiris Microsoft Windows Preexecution (PE) Release 2.1 image

Note: The Altiris Microsoft Windows PE image should be modified using the process outlined in the document Altiris Preboot Image Driver Injection: Cisco UCS C-Series Rack Servers Firmware Release 1.4.6.

- Tested server operating systems
  - Microsoft Windows 2008 SP2 x64
  - Microsoft Windows 2008 R2 x64

Creating a Driver Repository (DriverDB) for Use with Microsoft Windows 2008

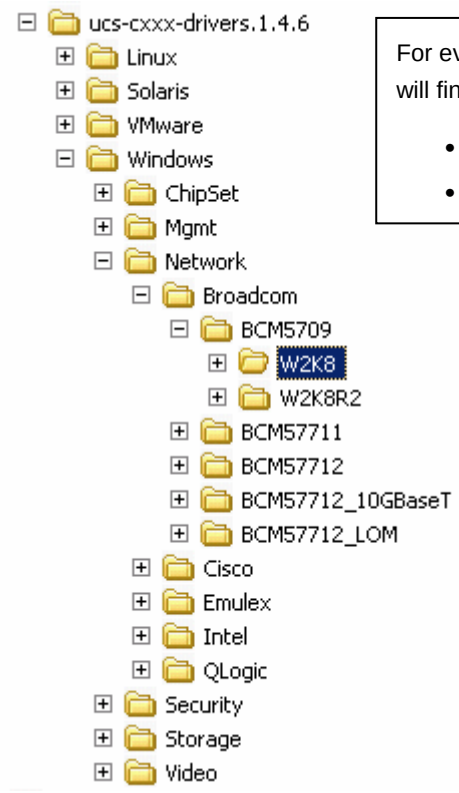
In this section, you create a folder structure containing Microsoft Windows 2008 device drivers from the Cisco UCS C-Series Rack Server drivers ISO image. This folder structure will be used during scripted OS deployments of Microsoft Windows 2008 (edits to the unattend.xml file will instruct the scripted OS deployment to install these drivers during installation).

Cisco unifies the OS drivers for Cisco UCS C-Series Servers, packaging certified drivers into a unified ISO image based on the firmware level with which they were certified. This document uses Microsoft Windows OS drivers based on Cisco UCS C-Series Servers Firmware Release 1.4.6.

Here is a direct link to the driver ISO image for Cisco UCS C-Series Servers Firmware Release 1.4.6: http://download.cisco.com/swc/esd/06/283860950/guest/ucs-cxxx-drivers.1.4.6.iso?

After the ISO image is extracted (for example, using WinZip, WinRAR, or 7-Zip), the drivers are placed into folders based on OS category: Linux, Solaris, Microsoft Windows, or VMware. Only the Microsoft Windows folder is discussed here (Figure 1).

Figure 1. Driver ISO Directory Listing



For every device or adapter that is supported in Microsoft Windows, you will find subfolders containing specific drivers for:

- W2K8 (Microsoft Windows 2008)
- W2K8R2 (Microsoft Windows 2008 R2)

The next steps involve copying device driver folders from the driver ISO image. The goal is to create a folder structure containing all the Microsoft Windows 2008 device drivers that are required for the Altiris preboot image. You should rename the subfolders so that you can easily identify the vendor, device model, and OS and architecture to which the driver applies. For example, for the Intel ICH10 disk controller, you could use Cisco_Intel_ICH10_W2K8_x64.

The drivers in the ISO are not all in a consistent format. The best approach is to extract the drivers for a specific device into a single folder that includes all required device driver files (.cat, .inf, and .sys). Some drivers are simplified, but others require some manipulation (for example, you may need to extract drivers from an executable installation file or identify the specific driver folder that is required for Microsoft Windows plug-and-play support).

Note: If a small ISO file is included in the driver directory, this ISO contains the exact drivers needed for this exercise.

All the drivers required are documented in the matrices in Tables 1 through 5. They are divided into five categories: chip sets, disk controllers, network adapters, SAN host bus adapters (HBAs), and converged network

adapters (CNAs). Tables 1 through 5 show the matrices and also include any additional instructions required for extracting the drivers. Figure 2 provides an example of driver extraction using the WinRAR right-click context menu.

Table 1. Chip Set Drivers

Chip Sets	Driver Path	Special Instructions
Cisco UCS C22	\Windows\ChipSet\Intel\C22\W2K8\All	None
Cisco UCS C24	\Windows\ChipSet\Intel\C24\W2K8\All	None
Cisco UCS C200	\Windows\ChipSet\Intel\C200\W2K8\All	None
Cisco UCS C210	\Windows\ChipSet\Intel\C210\W2K8\All	None
Cisco UCS C220	\Windows\ChipSet\Intel\C220\W2K8\All	None
Cisco UCS C240	\Windows\ChipSet\Intel\C240\W2K8\All	None
Cisco UCS C250	\Windows\ChipSet\Intel\C250\W2K8\All	None
Cisco UCS C260	\Windows\ChipSet\Intel\C260\W2K8\All	None
Cisco UCS C460	\Windows\ChipSet\Intel\C460\W2K8\All	None

Table 2. Disk Controller Drivers

Disk Controllers	Driver Path	Special Instructions
Intel ICH10R	\Windows\Storage\Intel\ICH10R\W2K8\x64	Extract and use the contents of ICH10R_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
Intel C600	\Windows\Storage\Intel\C600\W2K8\x64	Extract and use the contents of C600_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 1064E	\Windows\Storage\LSI\106xE\W2K8\x64	Extract and use the contents of 106xE_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 1068E	\Windows\Storage\LSI\106xE\W2K8\x64	Extract and use the contents of 106xE_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 9260-4i	\Windows\Storage\LSI\92xx\W2K8\x64	Extract and use the contents of 92xx_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 9260-8i	\Windows\Storage\LSI\92xx\W2K8\x64	Extract and use the contents of 92xx_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 9261-8i	\Windows\Storage\LSI\92xx\W2K8\x64	Extract and use the contents of 92xx_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 9280-4i4e	\Windows\Storage\LSI\92xx\W2K8\x64	Extract and use the contents of 92xx_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI SAS3081E-R	\Windows\Storage\LSI\3081E-R\W2K8\x64	Extract and use the contents of 3081E-R_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI SAS 2008-8i	\Windows\Storage\LSI\2008M\W2K8\x64	Extract and use the contents of 2008M_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI SAS 8708EM2	\Windows\Storage\LSI\8708EM2\W2K8\x64	Extract and use the contents of 8708EM2_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.
LSI 9201 Mass Storage	\Windows\Storage\LSI\9201\W2K8\x64	Extract and use the contents of 9201_W2K8_x64.iso. Extract with WinZip, WinRAR, or 7-Zip.

Figure 2. Example of Driver Extraction (LSI 1064E Driver) Using WinRAR

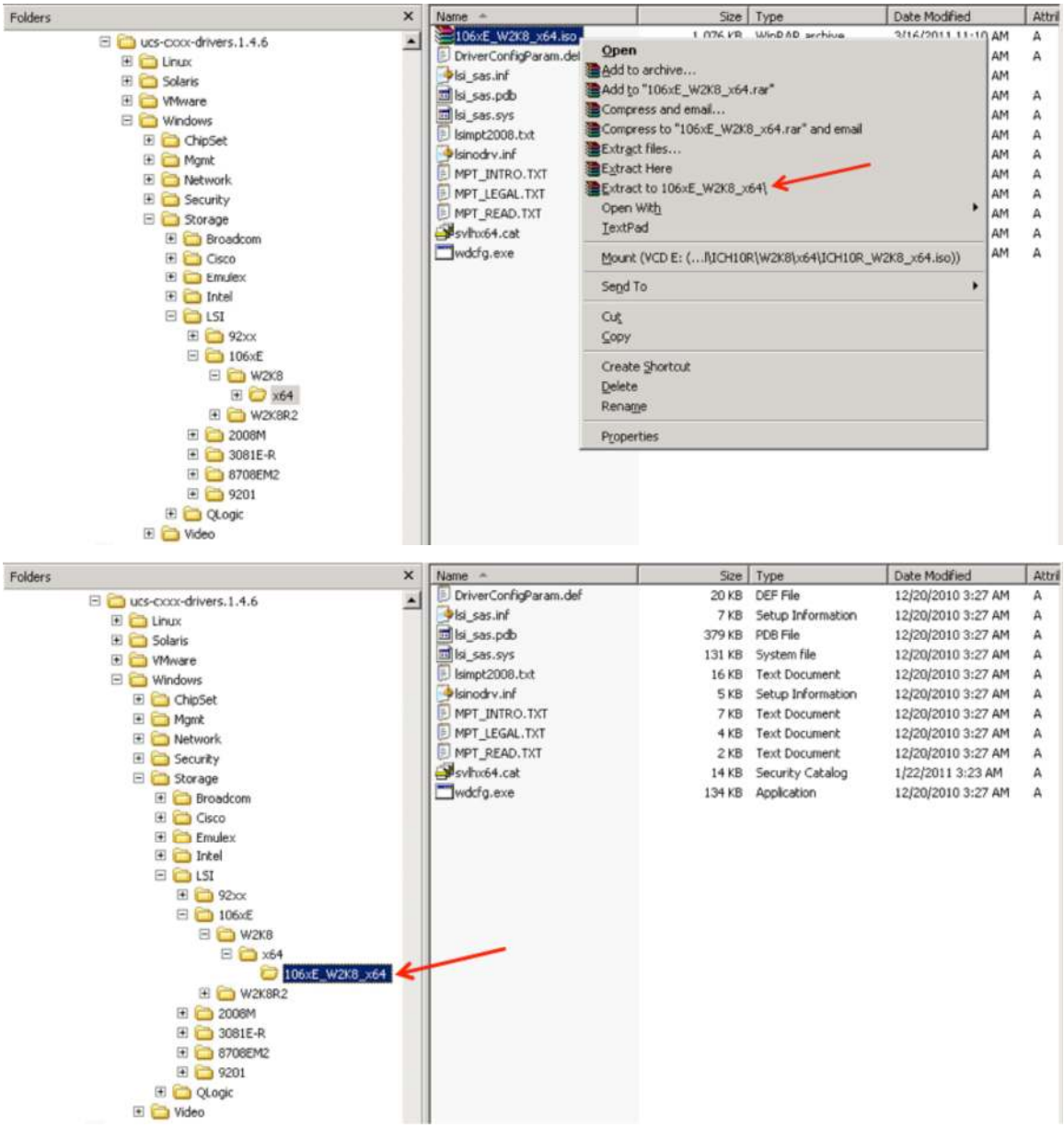


Table 3. Network Adapter Drivers

Network Adapters	Driver Path	Special Instructions
Intel 82576NS (LAN on Motherboard [LOM])	\Windows\Network\Intel\82576\W2K8\x64	Extract PROWinx64.exe. Use the contents of \PROWinx64\PRO1000\Winx64\NDIS61\.
Intel Quad E1G44ETG1P20	\Windows\Network\Intel\82576\W2K8\x64	Extract PROWinx64.exe. Use the contents of \PROWinx64\PRO1000\Winx64\NDIS61\.
Intel X520	\Windows\Network\Intel\X520\W2K8\x64	Extract PROWinx64.exe. Use the contents of \PROWinx64\PROXGB\Winx64\NDIS61\.
Intel I350	\Windows\Network\Intel\I350\W2K8\x64	Extract PROWinx64.exe. Use the contents of \PROWinx64\PRO1000\Winx64\NDIS61\.

Network Adapters	Driver Path	Special Instructions
Broadcom 5709 (Small Computer System Interface over IP [iSCSI])	\Windows\Network\Broadcom\ BCM5709\W2K8\x64\ois	None
Broadcom 5709 (Network Interface Card [NIC])	\Windows\Network\Broadcom\ BCM5709\W2K8\x64\nic	None
Broadcom 57711 (iSCSI)	\Windows\Network\Broadcom\ BCM57711\W2K8\x64\ois	None
Broadcom 57711 (NIC)	\Windows\Network\Broadcom\ BCM57711\W2K8\x64\nic	None
Broadcom 57712 (iSCSI)	\Windows\Network\Broadcom\ BCM57712\W2K8\x64\ois	None
Broadcom 57712 (NIC)	\Windows\Network\Broadcom\ BCM57712\W2K8\x64\nic	None
Broadcom 57712_10GBASE-T (iSCSI)	\Windows\Network\Broadcom\ BCM57712_10GBaseT\W2K8\x64\ois	None
Broadcom 57712_10GBASE-T (NIC)	\Windows\Network\Broadcom\ BCM57712_10GBaseT\W2K8\x64\nic	None
Broadcom 57712_LOM (iSCSI)	\Windows\Network\Broadcom\ BCM57712_LOM\W2K8\x64\ois	None
Broadcom 57712_LOM (NIC)	\Windows\Network\Broadcom\ BCM57712_LOM\W2K8\x64\nic	None
Mellanox ConnectX-2 EN	Not certified by Cisco for Microsoft Windows	–

Table 4. SAN HBA Drivers

SAN HBAs	Driver Path	Special Instructions
Emulex LPe 11002 (4 Gb)	\Windows\Storage\Emulex\LPe1x002\W2K8\x64	None
Emulex LPe 12002 (8 Gb)	\Windows\Storage\Emulex\LPe1x002\W2K8\x64	None
QLogic QLE2462 (4 Gb)	\Windows\Storage\QLogic\QLE2x62\W2K8\x64	None
QLogic QLE2562 (8 Gb)	\Windows\Storage\QLogic\QLE2x62\W2K8\x64	None

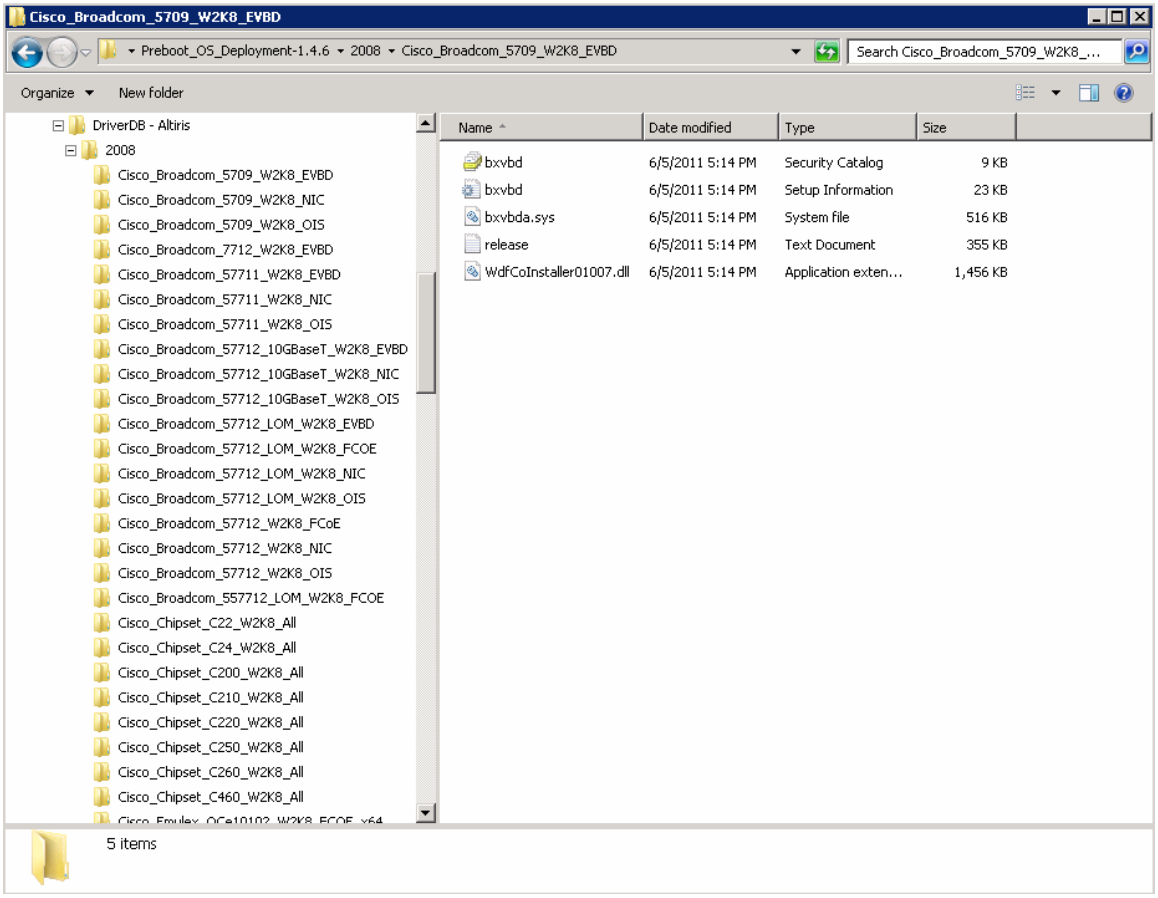
Table 5. CNA Drivers

CNAs	Driver Path	Special Instructions
Cisco UCS P81E Virtual Interface Card (VIC) (Ethernet-enic)	\Windows\Network\Cisco\P81E\W2K8\x64	None
Cisco UCS P81E VIC (Fibre Channel over Ethernet [FCoE]–fnic)	\Windows\Storage\Cisco\P81E\W2K8\x64	None
Cisco UCS VIC 1225 (Ethernet-enic)	\Windows\Network\Cisco\1225\W2K8\x64	None
Cisco UCS VIC 1225 (FCoE-fnic)	\Windows\Storage\Cisco\1225\W2K8\x64	None
Emulex OCe10102-F (Ethernet)	\Windows\Network\Emulex\OCe10102\W2K8\x64	None
Emulex OCe10102-F (FCoE)	\Windows\Storage\Emulex\OCe10102\W2K8\x64	None
Emulex OCe11102-F (Ethernet)	\Windows\Network\Emulex\OCe11102\W2K8\x64	None
Emulex OCe11102-F (FCoE)	\Windows\Storage\Emulex\OCe11102\W2K8\x64	None
QLogic QLE8152 (Ethernet)	\Windows\Network\QLogic\QLE8152\W2K8\x64	None
QLogic QLE8152 (FCoE)	\Windows\Storage\QLogic\QLE8152\W2K8\x64	None
QLogic QLE8242 (Ethernet)	\Windows\Network\QLogic\QLE8242\W2K8\x64	None
QLogic QLE8242 (FCoE)	\Windows\Storage\QLogic\QLE8242\W2K8\x64	None
Broadcom 57712 (FCoE)	\Windows\Storage\Broadcom\BCM57712\W2K8\x64\FCoE	None

Broadcom 57712_LOM (FCoE)	\Windows\Storage\Broadcom\BCM57712_LOM\W2K8\x64\FCoE	None

When you are finished, you should have a folder structure containing all the driver folders referenced in Tables 1 through 5, renamed according to their functions (Figure 3).

Figure 3. Folder Structure for All Drivers

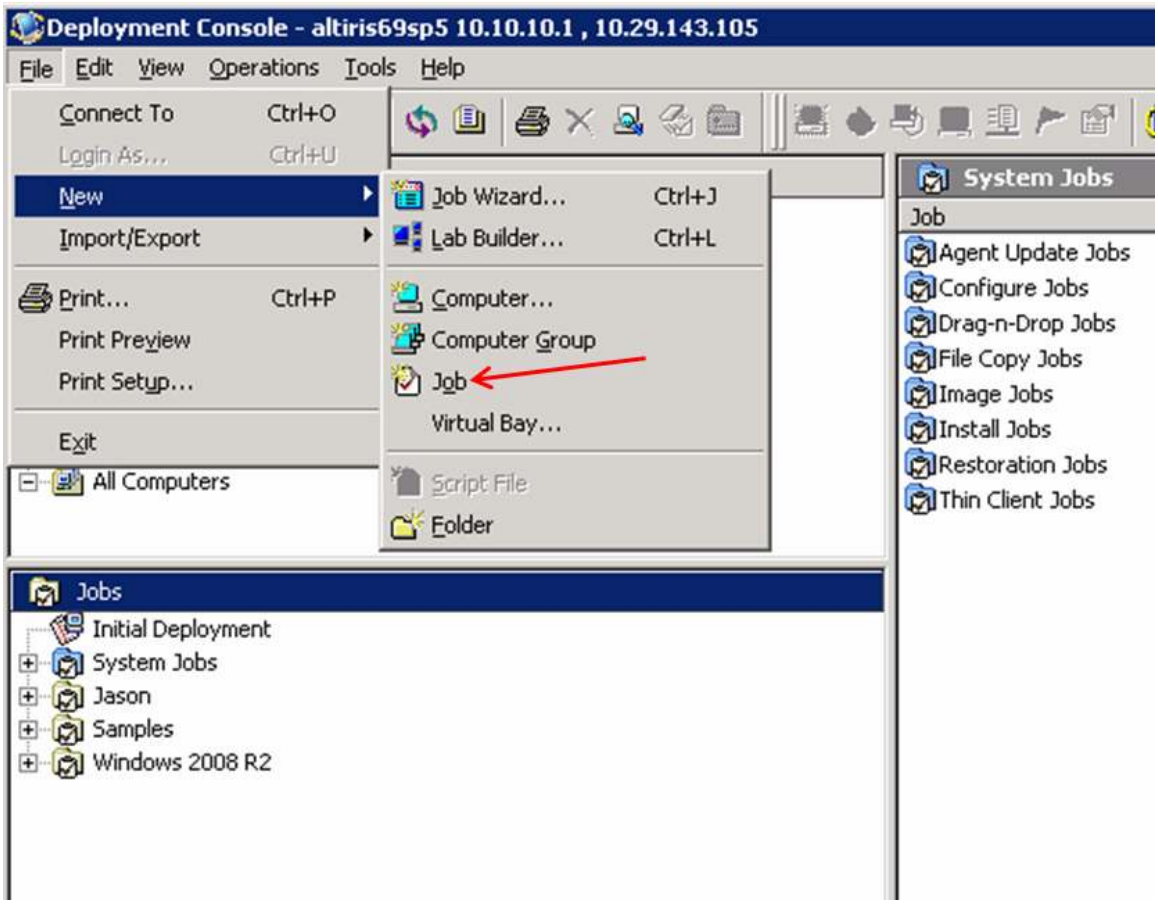


Creating an Altiris Job for Scripted OS Deployment of Microsoft Windows 2008

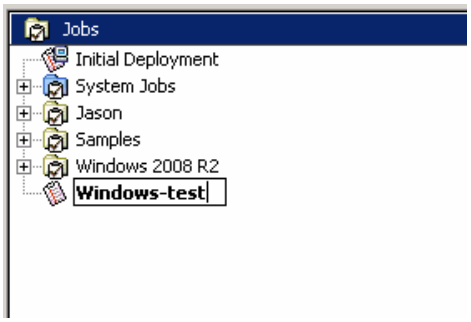
This section discusses how to:

- Create an OS installation source in Altiris for Microsoft Windows 2008
- Add the DriverDB folder (created in the previous section) that contains all the required Cisco drivers needed during scripted OS deployment of Microsoft Windows 2008
- Make the modifications necessary to the scripted OS Deployment unattend.xml file so that the drivers in the DriversDB folder are used during the device discovery phase of Microsoft Windows installation

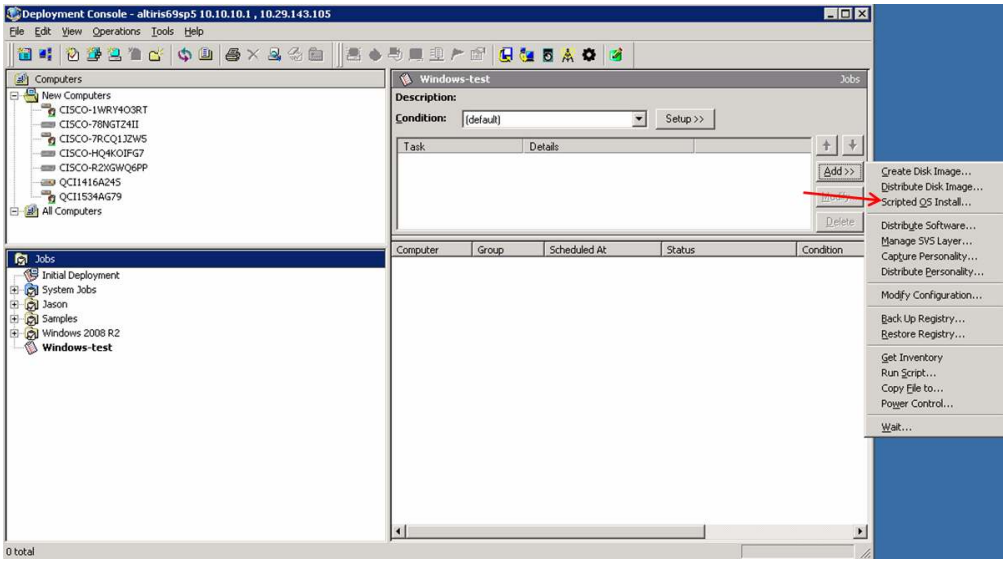
1. To create an OS repository, open the Altiris Deployment console, click File, and choose New > Job.



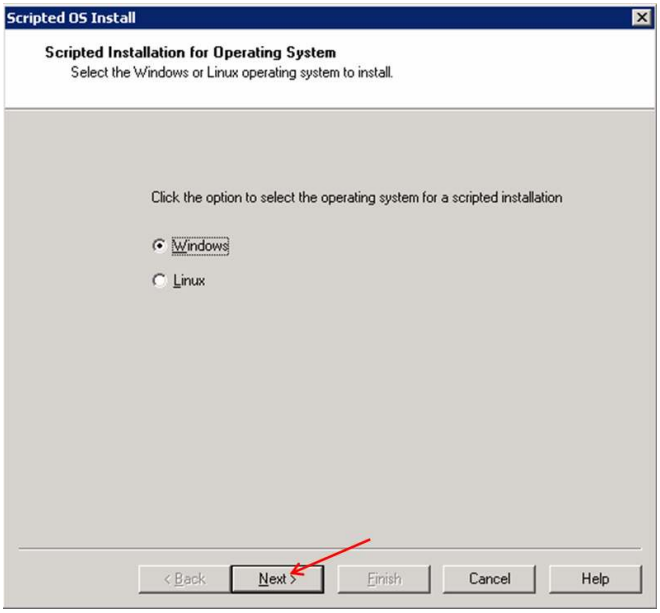
2. You will see a new job appear in the Jobs pane (in the lower-left corner). Provide a user-friendly name (Windows-test in this example).



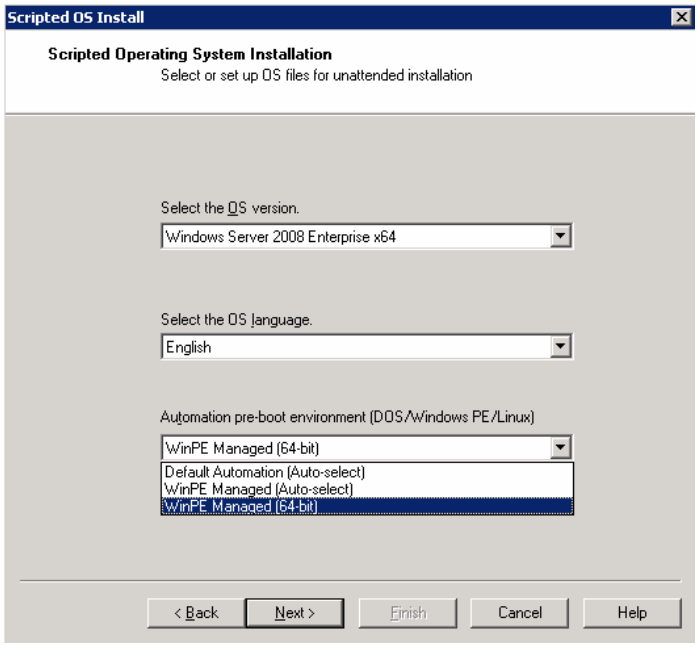
3. Select the new job and then click Add in the Jobs pane and choose Scripted OS Install.



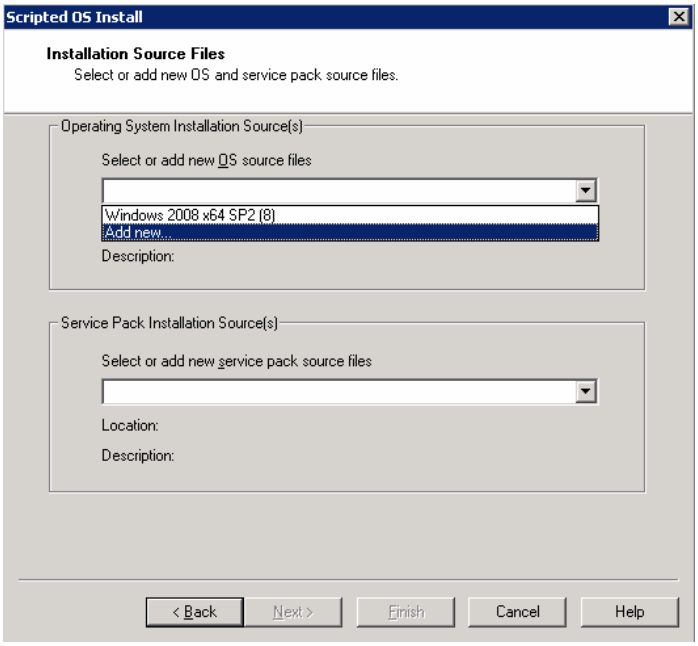
4. In the Scripted OS Install window, select the Windows button; then click Next.



5. On the following screen, from the “Select the OS version” drop-down menu, choose Windows Server 2008 Enterprise x64. Choose English for the OS Language and specify the newly modified WinPE Image for the preboot environment.



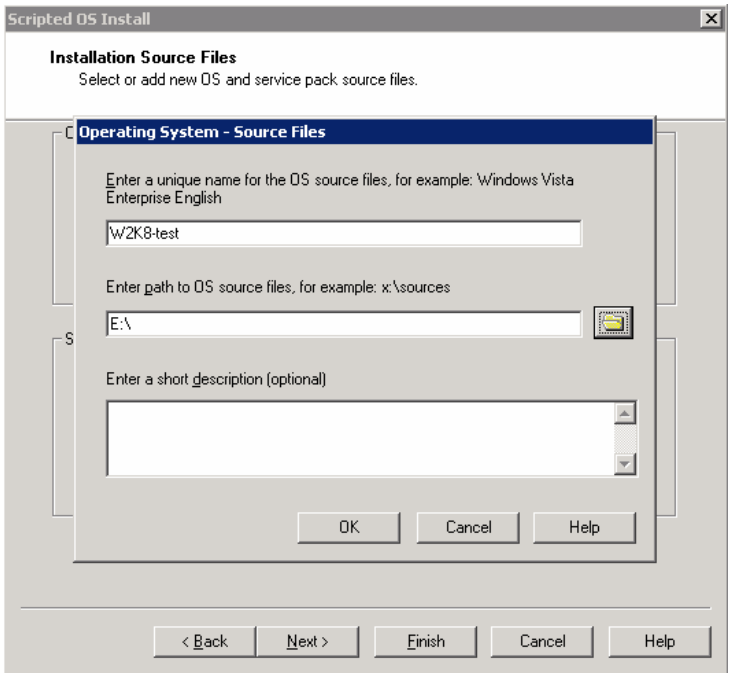
6. In the Operating System Installation Source(s) pane, choose Add New.



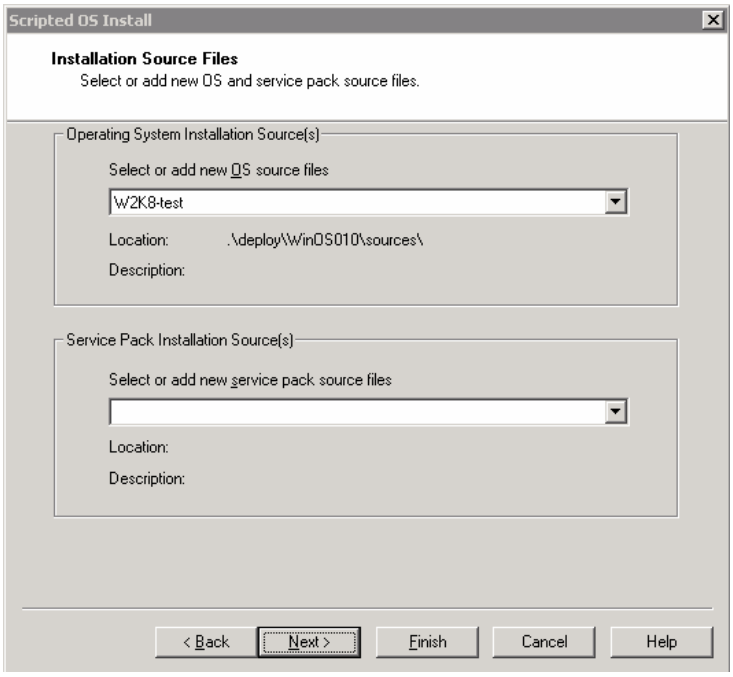
7. The wizard will now ask for the source files.
   a. Enter a unique name (W2K8-test in this example).
   b. Enter the path to the source Microsoft Windows installation media: for example, E:\.

Note: Note: Do not use the recommended path structure x:\sources. Instead browse to the Setup.exe file in the root of the source media.

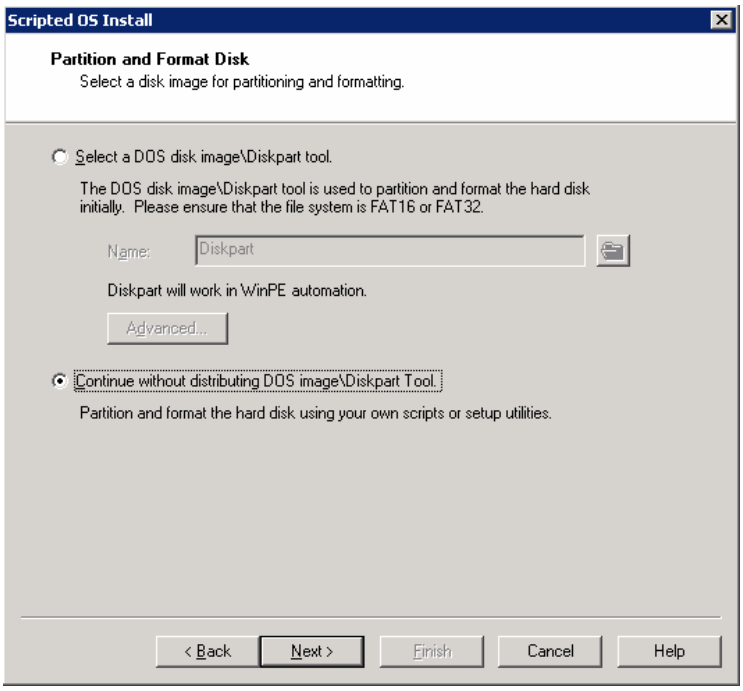
   c. Click OK. The files will begin to be copied.



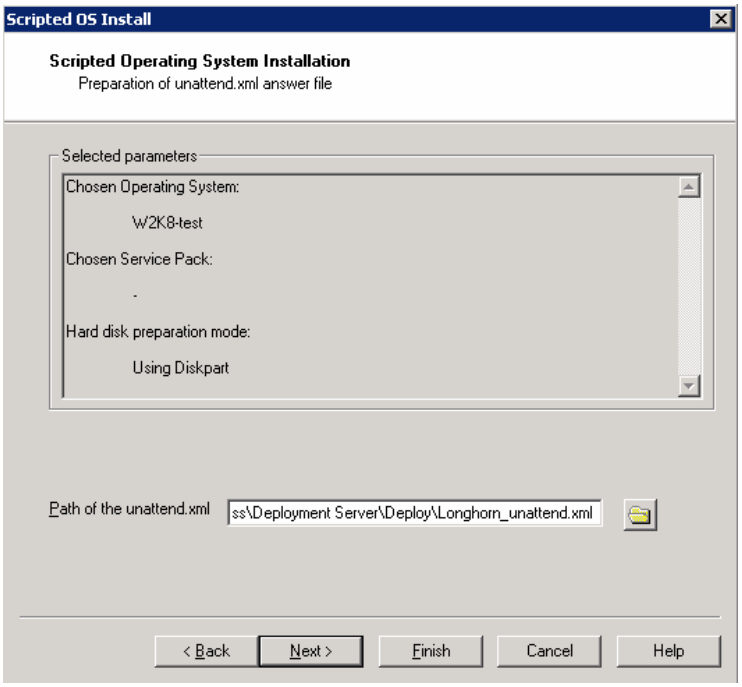
8. When copying is complete, click Next.



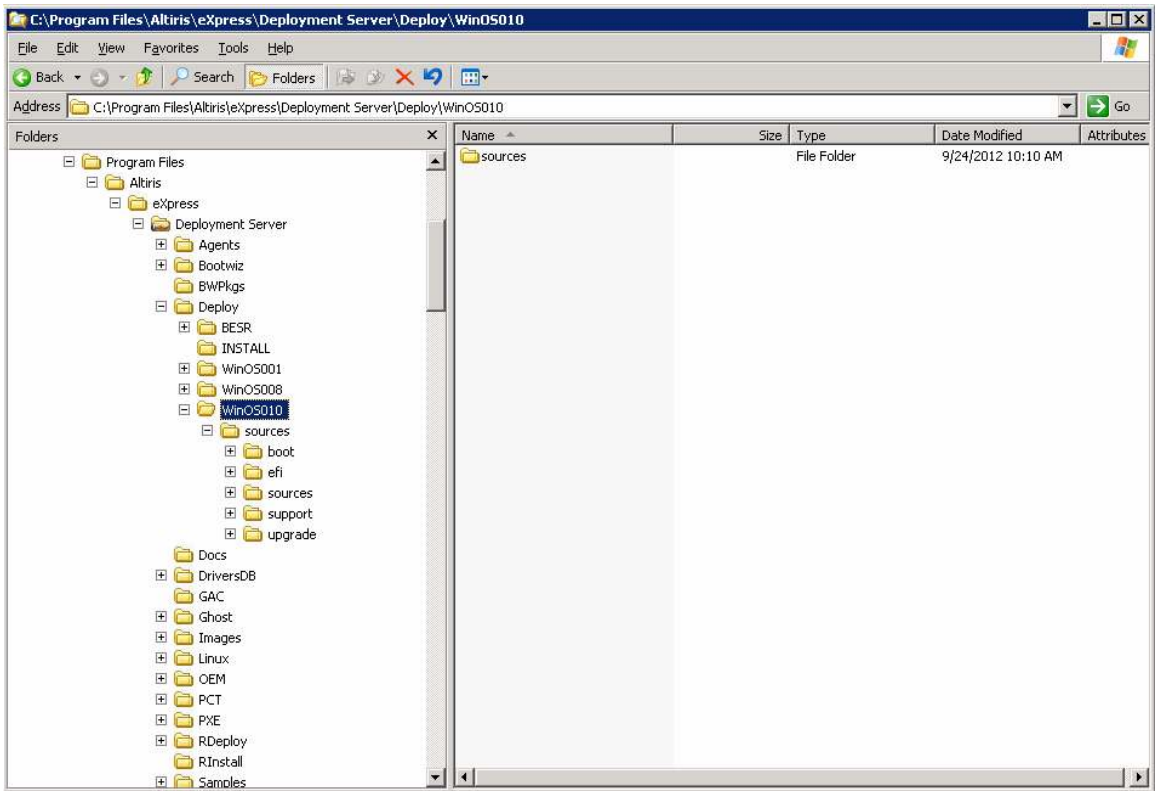
9. On the Partition and Format Disk screen, make a selection according to your environment (in the example here, a separate job is used to clean and partition the local disks before OS deployment). Then click Next.



10. Browse to the unattend.xml file (or to the default); then click Finish.

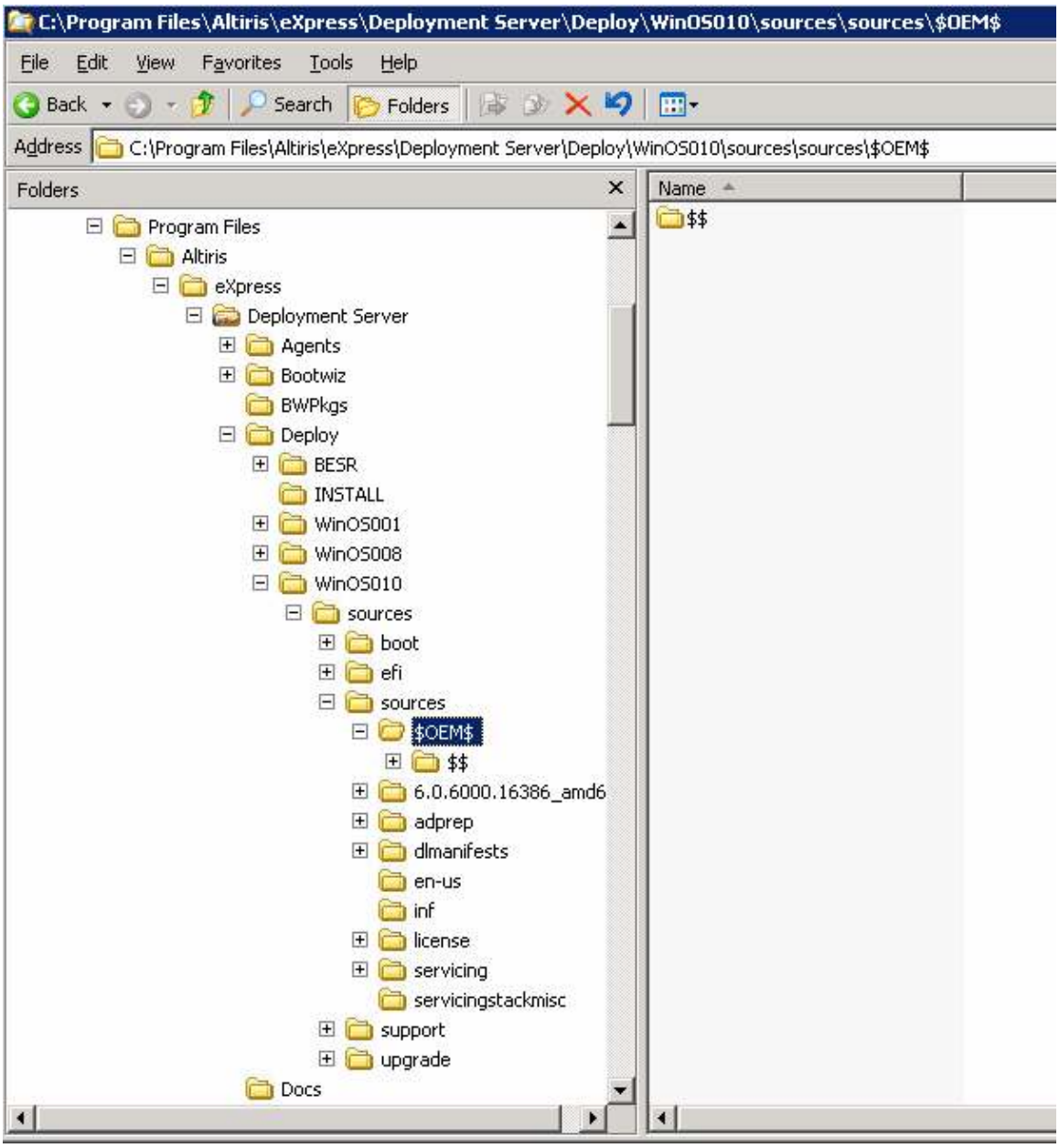


11. At this point, you will see the new OS source directory in C:\Program Files\Altiris\eXpress\Deployment Server\Deploy\WinOSxxx (WinOS010 in this example).



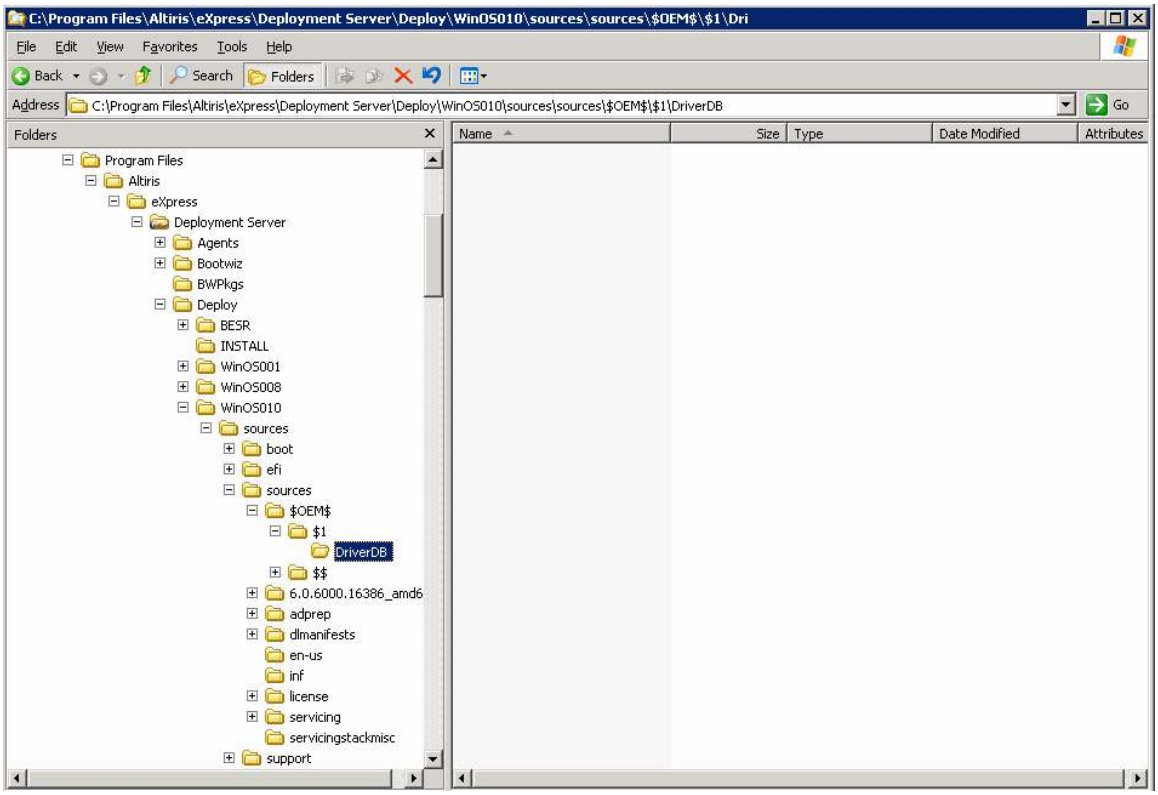
Adding a DriverDB Folder to Your Altiris OS Source Directory for Microsoft Windows 2008

1. Navigate to the sources\sources\$OEM$ folder of your new OS source directory (you will see a $$ directory, but you may or may not see a $1 directory).

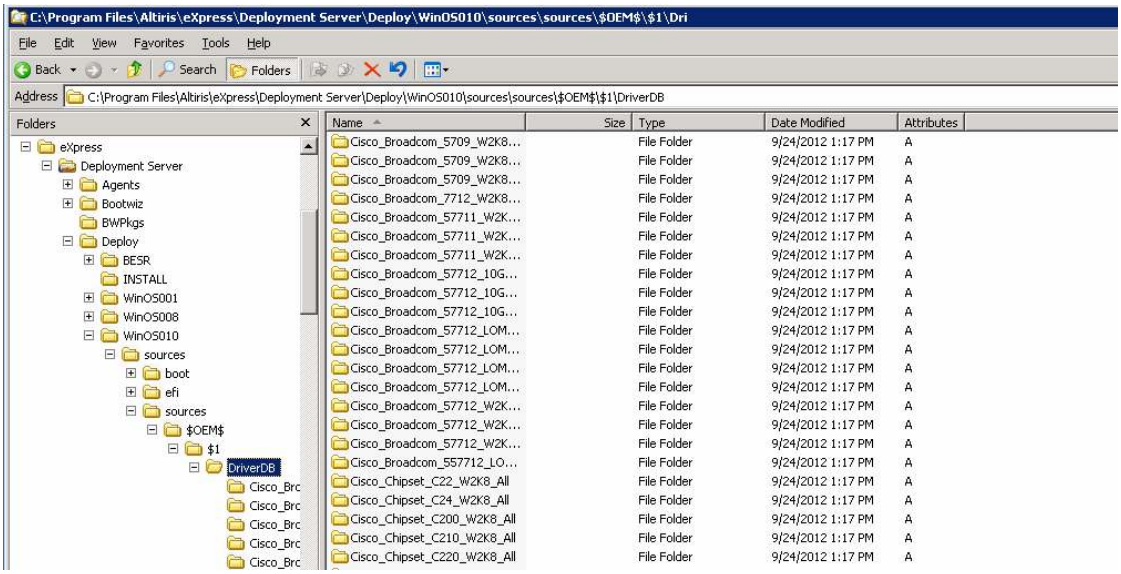


2. In the OEM folder, create a new folder called $1 (if it does not already exist), and inside the $1 folder create a new folder called DriverDB. The path in this example is C:\Program Files\Altiris\eXpress\Deployment Server\Deploy\WinOS010\sources\sources\$OEM$\$1\DriverDB\.

Note: Any folders inside the $1 folder are copied to %SYSTEMROOT% on the target drive of the OS being deployed (C:\ in this example).



3. Populate the new DriverDB directory with all the subfolders created earlier in the section “Creating a Driver Repository (DriverDB) for Use with Microsoft Windows 2008.”



4. Now that the DriverDB folder is populated, you need to modify the unattend.xml file, adding some syntax to direct the Microsoft Windows installer to install drivers from this directory during the scripted installation process. Browse to the unattend.xml file that was specified in the job and open it in a text editor. The following screen image shows the section of code that needs to be added to the unattend.xml file.

```
<settings pass="offlineServicing">
    <component name="Microsoft-Windows-PnpCustomizationsNonWinPE" processorArchitecture="amd64"
    publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
    xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State" xmlns:xsi="http://www.w3.org/2001/XMLSchema-ins
        <DriverPaths>
            <PathAndCredentials wcm:keyValue="5abbbda0" wcm:action="add">
                <Path>C:\DriverDB</Path>
            </PathAndCredentials>
        </DriverPaths>
    </component>
</settings>
```

Note: The Microsoft Windows Automated Installation Kit (WAIK) contains a utility called Microsoft Windows System Image Manager (WSIM) that can also be used to edit and validate the unattend.xml using the catalog in the Microsoft Windows installation media. This tool verifies that the options entered are valid for the specific media you are using for the installation.

Unattend.xml File for Microsoft Windows 2008

The working unattend.xml file used in the testing for this document is shown here.

Altiris_W2K8_unattend.xml

```
<?xml version="1.0" encoding="utf-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
  <settings pass="specialize">
    <component name="Microsoft-Windows-Shell-Setup" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
       <ProductKey>XXXXX-XXXXX-XXXXX-XXXXX-XXXXX</ProductKey>
    </component>
    <component name="Microsoft-Windows-Deployment" processorArchitecture="x86"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
       <RunSynchronous>
          <RunSynchronousCommand wcm:action="add">
             <Path>reg add &quot;HKLM\SOFTWARE\Policies\Microsoft\Windows
NT\CurrentVersion\NetworkList\Signatures\FirstNetwork&quot; /v Category /t
REG_DWORD /d 00000000 /f</Path>
             <Order>1</Order>
          </RunSynchronousCommand>
       </RunSynchronous>
    </component>
  </settings>
  <settings pass="windowsPE">
    <component name="Microsoft-Windows-International-Core-WinPE"
processorArchitecture="amd64" publicKeyToken="31bf3856ad364e35"
language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
       <SetupUILanguage>
          <UILanguage>en-us</UILanguage>
       </SetupUILanguage>
       <InputLocale>0409:00000409</InputLocale>
       <SystemLocale>en-us</SystemLocale>
       <UILanguage>en-us</UILanguage>
       <UserLocale>en-us</UserLocale>
    </component>
    <component name="Microsoft-Windows-Setup" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
       <ImageInstall>
          <OSImage>
             <InstallTo>
```

```
                    <DiskID>0</DiskID>
                    <PartitionID>1</PartitionID>
                </InstallTo>
                <InstallFrom>
                    <MetaData>
                        <Key>/IMAGE/Name</Key>
                        <Value>Windows Longhorn SERVERENTERPRISE</Value>
                    </MetaData>
                </InstallFrom>
            </OSImage>
        </ImageInstall>
        <UserData>
            <!--ProductKey>
                <Key>XXXXX-XXXXX-XXXXX-XXXXX-XXXXX</Key>
            </ProductKey-->
            <AcceptEula>true</AcceptEula>
            <FullName>Cisco Systems</FullName>
            <Organization>Cisco Systems</Organization>
        </UserData>
    </component>
  </settings>
  <settings pass="offlineServicing">
    <component name="Microsoft-Windows-PnpCustomizationsNonWinPE"
processorArchitecture="amd64" publicKeyToken="31bf3856ad364e35"
language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <DriverPaths>
            <PathAndCredentials wcm:keyValue="5abbbda0" wcm:action="add">
                <Path>C:\DriverDB</Path>
            </PathAndCredentials>
        </DriverPaths>
    </component>
  </settings>
  <settings pass="oobeSystem">
    <component name="Microsoft-Windows-Shell-Setup" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <OOBE>
            <HideEULAPage>true</HideEULAPage>
            <SkipUserOOBE>true</SkipUserOOBE>
            <NetworkLocation>Work</NetworkLocation>
            <ProtectYourPC>1</ProtectYourPC>
        </OOBE>
        <RegisteredOrganization>Altiris</RegisteredOrganization>
        <RegisteredOwner>Altiris User</RegisteredOwner>
        <TimeZone>Mountain Standard Time</TimeZone>
        <UserAccounts>
```

```
            <AdministratorPassword>
               <Value>YQBsAHQAaQByAGkAcwBBAGQAbQBpAG4AaQBzAHQAcgBhAHQAbwByAFAAYQBzA
HMAdwBvAHIAZAA=</Value>
               <PlainText>false</PlainText>
            </AdministratorPassword>
            <LocalAccounts>
               <LocalAccount wcm:action="add">
                  <Password>
                     <Value>YQBsAHQAaQByAGkAcwBQAGEAcwBzAHcAbwByAGQA</Value>
                     <PlainText>false</PlainText>
                  </Password>
                  <Name>Altiris</Name>
                  <Description>Altiris User</Description>
                  <DisplayName>Altiris</DisplayName>
                  <Group>Administrators</Group>
               </LocalAccount>
            </LocalAccounts>
         </UserAccounts>
      </component>
   </settings>
   <cpi:offlineImage cpi:source="catalog:e:/sources/install_windows longhorn
serverenterprise.clg" xmlns:cpi="urn:schemas-microsoft-com:cpi" />
</unattend>
```

For More Information

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