Deploying VMware® ESX Server 3.0.1 to IBM® System x™ Using Altiris® Deployment Solution™ 6.8 SP1

This document describes script-based deployment of ESX Server 3.0.1 on IBM System x servers, using Altiris Deployment Solution 6.8 SP1. This is a script-based, unattended installation, that uses a pre-configured answer file (called a kickstart file) to replace user interaction.

Configuring and running this unattended installation is described in the following five sections of this document:

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Document Version: 1.0

Last Modified: 5/31/2007

1.1 Populating the SGTK source tree

Before deploying ESX Server 3.0.1, the contents of the installation media must be copied to the Deployment Share. The files can be copied to any directory inside the Deployment Share, but copying them to the ServerGuide™ Scripting Toolkit (SGTK) source tree is recommended by the *Deployment using Altiris on System x and BladeCenter Servers* Redbook™.

As an example, the ***Scripted install of VI 3.0** sample deployment job that is included with Deployment Solution 6.8 SP1 assumes that the installation media is in the .\deploy directory within the Deployment Share by default.

Default Directory Information

The default path to the Deployment Share directory is:

C:\Program Files\Altiris\express\Deployment Server

The default path to the ServerGuide Scripting Toolkit directory is:

C:\Program Files\Altiris\express\Deployment Server\sgdeploy

This directory is also referred to as the SGTK source tree.

Follow the steps below to copy the installation media:

1. Insert the VMware ESX Server 3.0.1 installation CD into the CD-ROM drive of your Deployment Server.

2. Using Windows Explorer™, open the CD and copy the entire contents to the following directory within the Deployment Share:

   .\sgdeploy\os\esx301

Note: By default, the esx301 directory does not exist, and must be created manually.

1.2 Installing and configuring IIS for ESX Server deployment

ESX Server deployment requires an FTP server, HTTP server, or network file share from which to install the operating system installation files to the target computer. This document covers the HTTP server method of serving installation files to the target computer using Microsoft® Internet Information Services™ (IIS), and assumes the reader has a working knowledge of Microsoft IIS.

1.2.1 Installing Microsoft IIS

Note: In this example, Microsoft IIS is installed on the Deployment Server, but it is not required for the HTTP server to be on the same server as the Deployment Server.

Note: You may be asked to insert the Windows® installation CD during the installation of Microsoft IIS.

To install and configure Microsoft IIS:

1. Click **Start → Settings →Control Panel**

2. Click **Add or Remove Programs**

3. Click **Add/Remove Windows Components**

4. After the Windows Components Wizard loads, select the Application Server item from the list and click **Details** (see Figure 1-1)
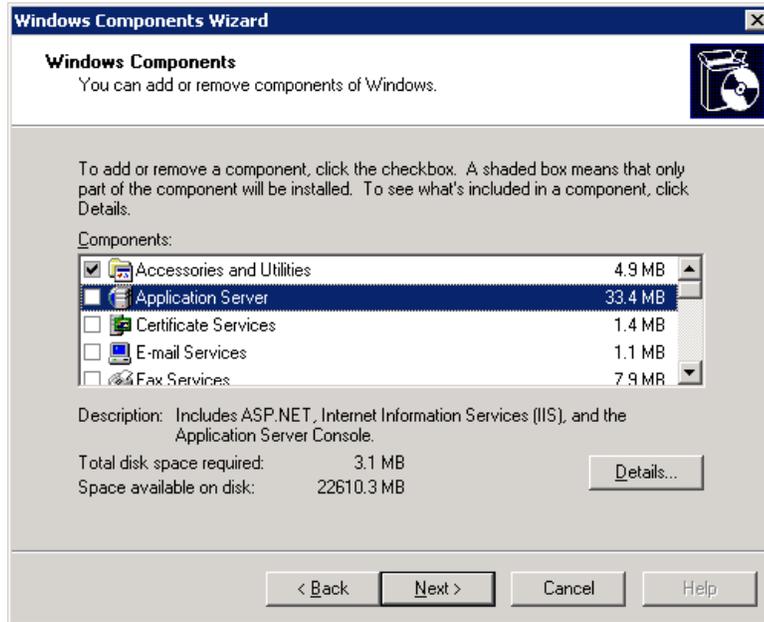

Figure 1-1   The Windows Component Wizard

5. Click to check the box for **Internet Information Services (IIS)**, and then click **OK**
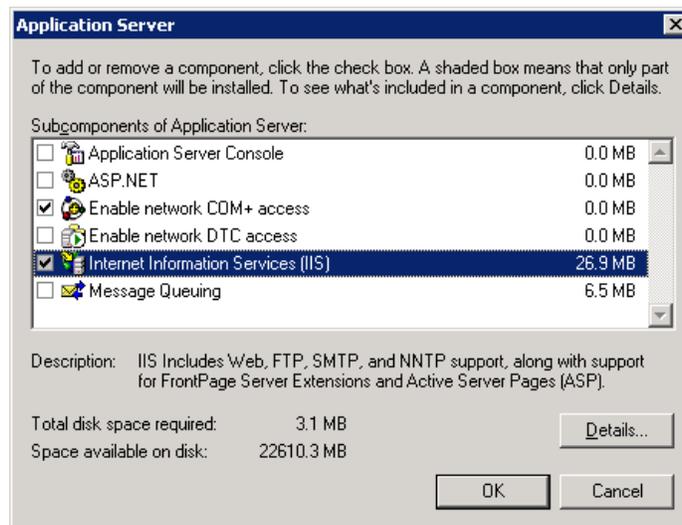
6. Click **Next** to begin installing Microsoft IIS

Figure 1-2   The Windows Component Wizard displaying the Application Server dialog box

1.2.2 Configuring Microsoft IIS

After you have installed Microsoft IIS, you need to create a virtual directory and point it to the SGTK source tree.

To create a virtual directory and point it to the SGTK source tree:

1. Open Internet Information Services Manager by clicking
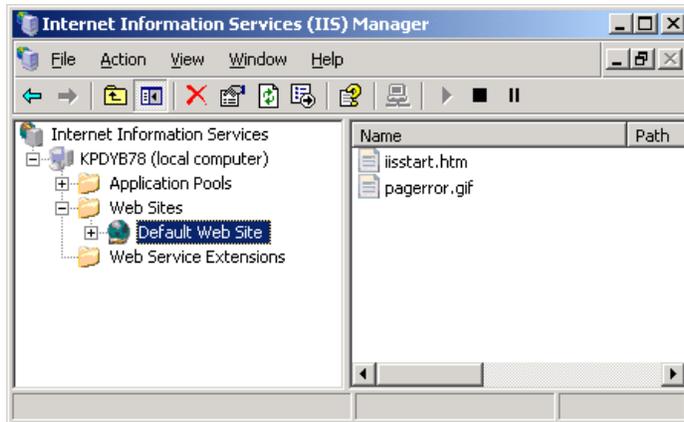   **Start →Programs →Administrative Tools →Internet Information Services (IIS) Manager**

Figure 1-3   Internet Information Services Manager

2. Expand the Web Sites node, right-click the **Default Web Site** icon, and then click **New →Virtual Directory** from the menu

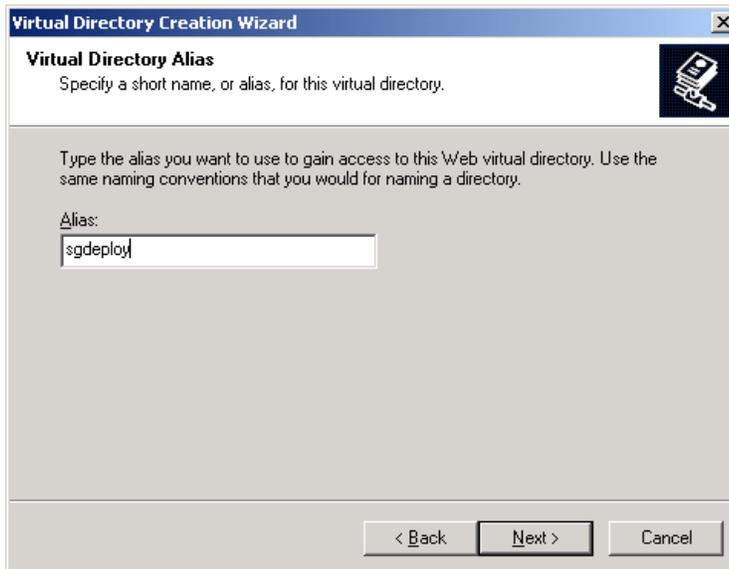3. Type **sgdeploy** as the alias for the new virtual directory, and then click **Next**

Figure 1-4   The Virtual Directory Creation Wizard displaying the Alias dialog box

4. Click **Browse**, navigate to the SGTK source tree (Figure 1-5 on page 8), and then click **Next**
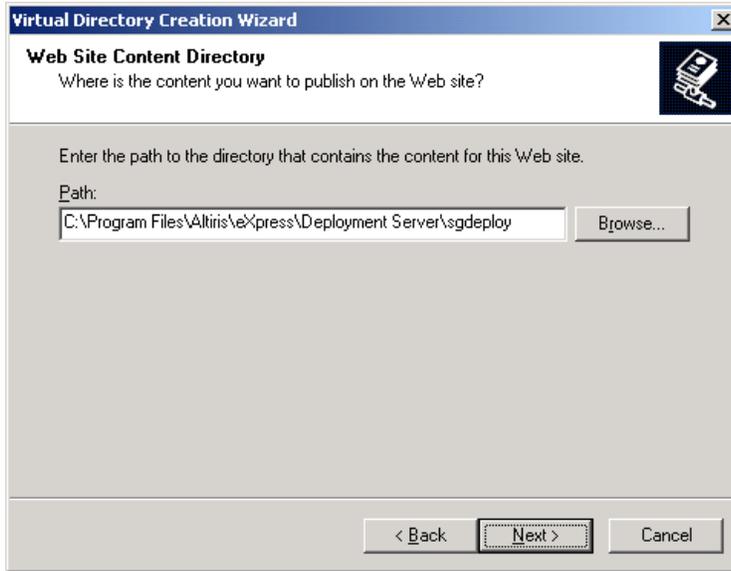
Figure 1-5   The Virtual Directory Creation Wizard displaying the Content Directory dialog box

5. On the Access Permissions dialog box, check the box for **Read** and the box for **Browse**, and then click **Next**
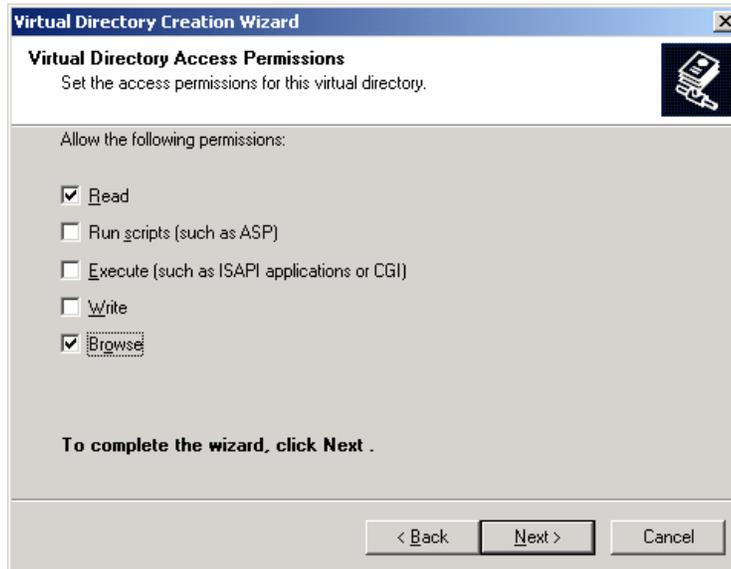

Figure 1-6   The Virtual Directory Creation Wizard displaying the Access Permissions dialog box

6. Click **Finish** to return to the Internet Information Services Manager main console (Figure 1-3 on page 7)

7. Expand the Web Sites node, and then expand the Default Web Site node. Right-click the newly created **sgdeploy** node and then click **Properties** from the menu

8. From the sgdeploy Properties dialog box, click the **HTTP Headers** tab, and then click **MIME Types** in the MIME Types section of the dialog box (Figure 1-7 on page 9)
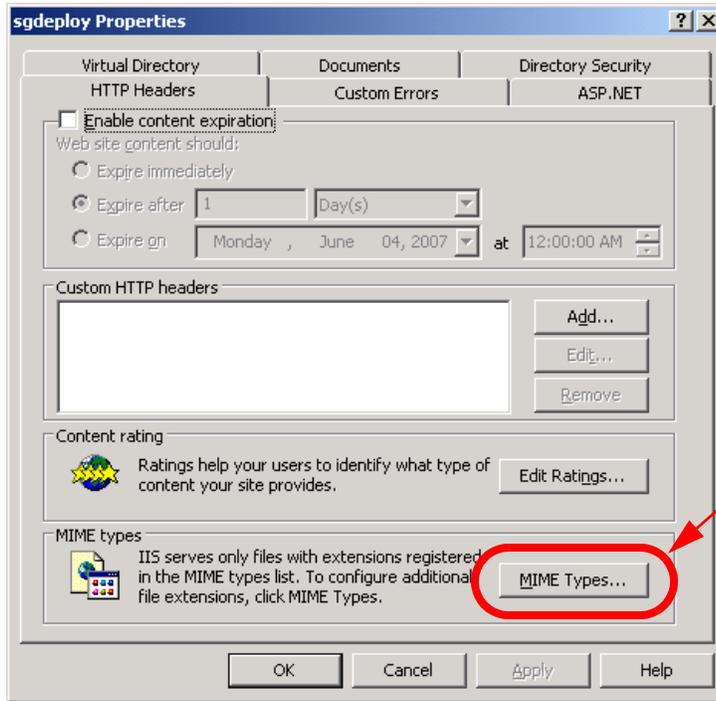
Click MIME Types

Figure 1-7   The sgdeploy Properties dialog box displaying the HTTP Headers tab
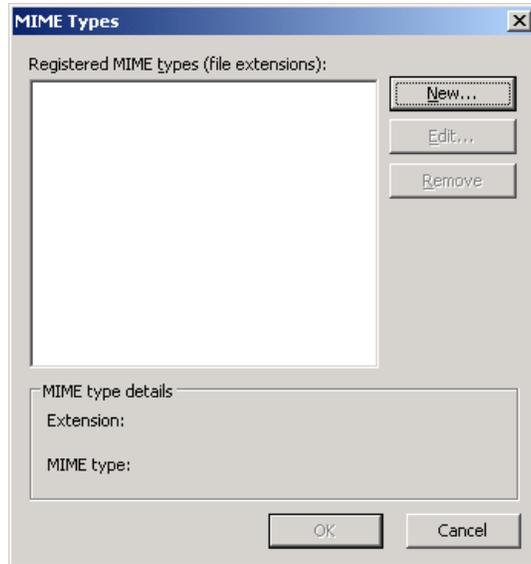
9. Click **New**

Figure 1-8   The MIME Types dialog box

10. In the Extension field type **.*** (i.e. a period, followed by an asterisk). In the MIME Type field type **application/octet-stream** (Figure 1-9 on page 10)
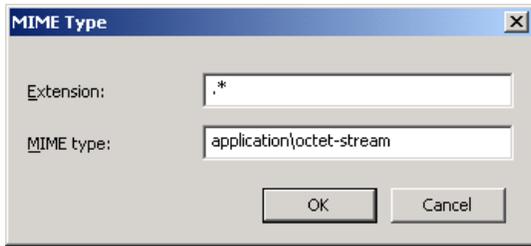
Figure 1-9   The MIME Type dialog box

11. Click **OK**, and then click **OK** again to close the Properties dialog box

Microsoft IIS configuration is now complete.

1.3 Creating a kickstart file

The kickstart file is a standard Red Hat® kickstart installation file that contains some special commands specific to VMware and Altiris.

For more information regarding generic Red Hat kickstart files, refer to official Red Hat documentation at the following URL:

http://www.redhat.com/docs/manuals/linux/

A sample kickstart file (KS.CFG) can be found in the following directory located in the Deployment Share:

.\samples\VMware\ESX3\KS.CFG

> **Important:** Use only Linux®-based text editors to edit kickstart files. If you edit the kickstart file using some Windows-based text editors, there will be a carriage return character at the end of each line that the kickstart processor will not handle properly.
>
> Should you encounter this problem, you can fix it by running the following command in Linux on the file to remove the carriage return characters:
>
> ```
> tr -d "\r" < ks.cfg > ks2.cfg
> ```

1.3.1 Kickstart sections and commands

The kickstart file for ESX Server 3.0.1 Altiris deployment is composed of up to five sections:

- ► commands
- ► %packages
- ► %pre
- ► %post
- ► %vmlicense_text

> **Important:** The commands section is **required** and must appear first in the kickstart file.

The commands section

The commands section contains a list of options for the ESX Server installation. It's composed of mostly generic Red Hat kickstart commands, but also contains some specific ESX Server commands.

Table 1-1 lists the required (unless otherwise noted) kickstart commands, and their default arguments, that appear in the commands section of the kickstart file for Altiris deployment.

Table 1-1   Basic Linux kickstart commands with their default arguments for Altiris deployment

Command	Arguments
url	Install from an installation tree on a remote server via FTP, NFS, or HTTP **--url ftp://<server ip address>/sgdeploy/os/esx** Points the install to the FTP server housing the installation media
rootpw	Configures the system's root password **<password for root>**
auth *or* authconfig	Configures authentication options **--enableshadow** Enables the use of shadow passwords **--enablemd5** Enables MD5 on user passwords
bootloader	Specifies how the bootloader should be installed **--location=mbr** Specifies where the bootloader is written
timezone	Configures the time zone of the target computer **America/Chicago**
skipx	If present, X is not configured on the installed computer
install	Sets the deployment type to install rather than update
text	Performs the kickstart installation in text mode
network	Configures the network of the target computer for both the installation and the final installed computer **--device eth0** Sets the default NIC to eth0 **--hostname=<hostname>** Defines the host name of the system **--bootproto [dhcp]|[static]** Sets the NIC to get its IP via DHCP or static If static is selected the following can be used: **--ip=<ip address>** Defines the IP address of the NIC **--netmask=<netmask>** Defines the net mask of the NIC The following two optional commands are VMware specific: **--addvmportgroup=<1 or 0>** Set to 1 to create a port group for virtual machines, or to 0 if you do not want to create a port group **--vlanid=<vlanid>** Set to an integer between 0 and 4095 to specify a VLAN to use for networking
lang	Sets the default language for the target computer **en_US** Sets the default to English
langsupport	Configures the language support for the target computer **--default en_US**
keyboard	Sets the target computer's keyboard type **us**
mouse	Configures the mouse for the target computer **none** Sets the default to no mouse
reboot	Reboots the target computer after the installation completes

Command	Arguments
clearpart	Removes partitions on the target computer prior to the creation of new partitions **--all** Removes all existing partitions **--initlabel** Initializes the disk label to the default for your architecture **--drives=sda** Specifies which drive to clear the partitions from
vmaccepteula	ESX Server specific command that accepts the EULA
vmlicense *(optional)*	ESX Server specific command that configures the licensing for the ESX server. This can also be configured post install. **--mode=server --server=<hostname or IP of the server>** Configures server-based licensing. *or* **--mode=file** The contents of the license file must be included in the %vmlicense_text section of the kickstart file. Optional arguments for either of the arguments listed above are as follows: **--features=<features>** An optional, comma-separated list of features to request from the licensing server **--edition=<edition>** The ESX Server edition

Table 1-2 lists the kickstart partitioning commands that make up the remainder of the commands section of the kickstart file. Note that the order in which they are listed in the kickstart file determines the order in which the partitions will be created on the target computer's hard disk.

Important: The last item in Table 1-2 (**part None --size 100 --fstype vmkcore --ondisk sda**), must be listed last in the commands section of the kickstart file because the partition it creates must be the last one created on the target computer's hard disk.

Table 1-2   Linux kickstart partition commands with their default arguments for Altiris deployment

Command	Arguments
part /boot	Configures a 100 MB boot partition **--size 100** **--fstype ext3** **--ondisk sda**
part /	Configures a 5 GB root file system partition. Can be made larger if desired **--size 5000** **--fstype ext3** **--ondisk sda**
part swap	Configures a 1GB swap partition **--size 1024** **--fstype swap** **--ondisk sda**
part /var/log	Configures a 2 GB system log partition. Always break this out **--size 2000** **--fstype ext3** **--ondisk sda**
part /tmp	Configures a 2 GB temp partition. Always break this out **--size 2000** **--fstype ext3** **--ondisk sda**

Command	Arguments
part None	Configures a 10 GB VMFS partition. This only creates the partition. You must create the file system later **--size 10000** **--grow** **--fstype vmfs3** **--ondisk sda**
part None	Configures a vmkernel core dump partition. Must be 100 MB. This must be the last line in partitioning section, to place at the end of the disk **--size 100** **--fstype vmkcore** **--ondisk sda**

The %packages section

The %packages section is **required**, and it must follow the commands section. The %packages section lists packages for installation, and consists of the following two lines:

```
%packages
@base
```

The %pre section

The %pre section allows you to specify scripts to run prior to installing ESX Server on the target computer. This section is **optional**, and it must come after the commands section.

The sample kickstart file does not contain a %pre section because it does not run any scripts prior to installing ESX Server on the target computer. If a script were required, it would consist of the following lines:

```
%pre
<enter your script text here>
```

The %post section

The %post section allows you to specify scripts to run after installing ESX Server on the target computer. This section is **optional**, and it must come after the commands section.

In the sample kickstart file, this section runs a number of scripts.

The first script installs the Altiris ADLagent (the Altiris Deployment Agent for Linux) by performing the following eight steps:

1. Creates a directory for the ADLagent installation files on the target computer

2. Disables the ESX Server firewall

3. Mounts the Deployment Share, and then checks for an existing ADLagent custom configuration file (adlagent.conf.custom). If the file exists, it is copied to the mount point on the target computer

4. Copies the ADLagent installation files to the target computer, and then begins installing ESX Server on the target computer

5. Unmounts the Deployment Share, and deletes the mount point on the target computer

6. Enables the ESX Server firewall

7. Configures the ESX Server firewall by opening ports 402 and 4321 to allow communication between the ADLagent and the Deployment Server

8. Starts the ADLagent service

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There are several lines (commented out by default) that come after the ADLagent installation script that enable various features within ESX Server. Read through the script, and then uncomment (i.e. remove the # symbols preceding them) lines to turn on various features.

The %vmlicense_text section

This section contains the text of the license file for the ESX Server installation, and it must come after the commands section. This section is **only required if you choose the file mode for licensing**.

Omit this section if you choose host-based licensing.

To use file mode licensing, copy the text from an existing license file to the %vm_license_text section of the kickstart file.

1.3.2 Kickstart modification

The sample kickstart file must be modified before it can be used for ESX Server deployment.

Open the kickstart file in a Linux-based text editor. The first line that requires modification is in the Installation Method section.

The Installation Method section contains three options for ESX Server deployment: NFS, FTP, or HTTP. This document covers the HTTP method for deployment.

HTTP is selected as the default method for serving the installation files. NFS and FTP are disabled (i.e. commented out by the # symbol preceding the line).

Figure 1-10 shows the Installation Method section of the sample kickstart file.

```
# Installation Method
#nfs --server=<server ip address>  --dir=/<sharename>/<directory>
#url --url ftp://<server ip address>/<directory>
url --url http://192.168.1.1/ESX301
```

Figure 1-10   The Installation Method section of the sample kickstart file

Type the IP address of your HTTP server and the directory containing the ESX Server installation files. In our example the http URL is:

```
http://192.168.0.1/sgdeploy/os/esx301
```

.

> **Important:** If you use FTP as your deployment method, the virtual directory and MIME type must still be created as described previously in section 1.2.2, "Configuring Microsoft IIS" on page 7.

After you have modified the Installation Method section, it should look like the section shown in Figure 1-11 on page 15. Replace "*<your server ip address>*" with the IP address of your HTTP server.

```
# Installation Method
#nfs --server=<server ip address>  --dir=/<sharename>/<directory>
#url --url ftp://<server ip address>/<directory>
url --url http://<your server ip address>/sgdeploy/os/esx301
```

Figure 1-11   The Installation Method section (after modification)

The Network Install Type section (see Figure 1-12) only needs to be modified if you *don't* plan to pre-provision the target computer. If you *do* plan on pre-provisioning the target computer, the Altiris tokens will be replaced during the token replacement process and no modification is required.

Server pre-provisioning is covered in section 1.5, "Altiris tokens and server pre-provisioning" on page 24.

This section assumes you are not pre-provisioning the target computer.

```
# Network install type
# network --device eth0 --bootproto dhcp --hostname=%SERIALNUM%
network --device eth0 --bootproto static --ip=%NIC1IPADDR%
--netmask=%NIC1IPNETMASK% --hostname=%COMPNAME%
```

Figure 1-12   The Network Install Type section of the sample kickstart file

The *--device eth0* argument is required to notify the installer which NIC to use during installation *if* the target computer has more than one NIC. If this argument is unspecified and the target computer has multiple NICs, the installation halts and asks the user to select which NIC to use.

In this example, the first NIC is used so the *--device eth0* argument will remain unchanged.

If you are using PXE (pre-boot execution environment) to boot the target computer instead of a boot disk, a DHCP server is available and the *--bootproto* argument can be set to DHCP instead of using a static IP address. Once the target computer has been successfully deployed with ESX Server, the administrator can assign it a custom, static IP address. This document covers the DHCP method of issuing the IP address.

In addition to the changes above, change the *--hostname* argument to a NetBIOS name appropriate to your environment.

Once you have made the modifications, the Network Install Type section should look like the example in Figure 1-13.

```
# Network install type
# network --device eth0 --bootproto dhcp --hostname=%SERIALNUM%
network --device eth0 --bootproto dhcp --hostname=<your hostname here>
```

Figure 1-13   The Network Install Type section (after modifications)

ADLagent-specific script modification

If you wish to install the ADLagent (the Altiris Deployment Agent for Linux) during the installation process, you must make modifications to the ADLagent installation script in the %post section of the kickstart file.

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> **Note:** To successfully install the ADLagent, the default username and password must be changed to a user account with administrative privileges on the Deployment Share.

You must also enable the following line (i.e remove the **#** symbol) if you do not have name resolution enabled for your environment:

`#DSADDR=%#*"select tcp_addr from dbo.aclient_prop where computer_id=0"%`

After modifications are made, the %post section should contain the lines shown in Figure 1-14. (The configuration shown is for an environment without name resolution.)

```
echo "MOUNTING EXPRESS SHARE"

# Mount the eXpress share to the mount point /mnt/ddp
# ----------
# The variable DSADDR is set to the name of the DS server by default, if your
network does
# not have name resolution uncomment the lower DSADDR variable assignment to
use the IP address.
#DSADDR=%DSSERVER%
DSADDR=%#*"select tcp_addr from dbo.aclient_prop where computer_id=0"%
mount -t smbfs -o username=<my user account>,password=<my password>
//$DSADDR/express /mnt/ddp
```

Figure 1-14   The script that mounts the Deployment Share after changes

The changes above are all the modifications **required** for ESX Server deployment; however, other modifications may be made to suit your environment.

1.4 Creating a custom deployment job

Altiris Deployment Solution includes a sample job template for deploying ESX Server 3.0.x. The sample job template is called ***Scripted install of VI 3.0**.

To find it, open the Deployment Console. From the Jobs pane, browse to the following folder:
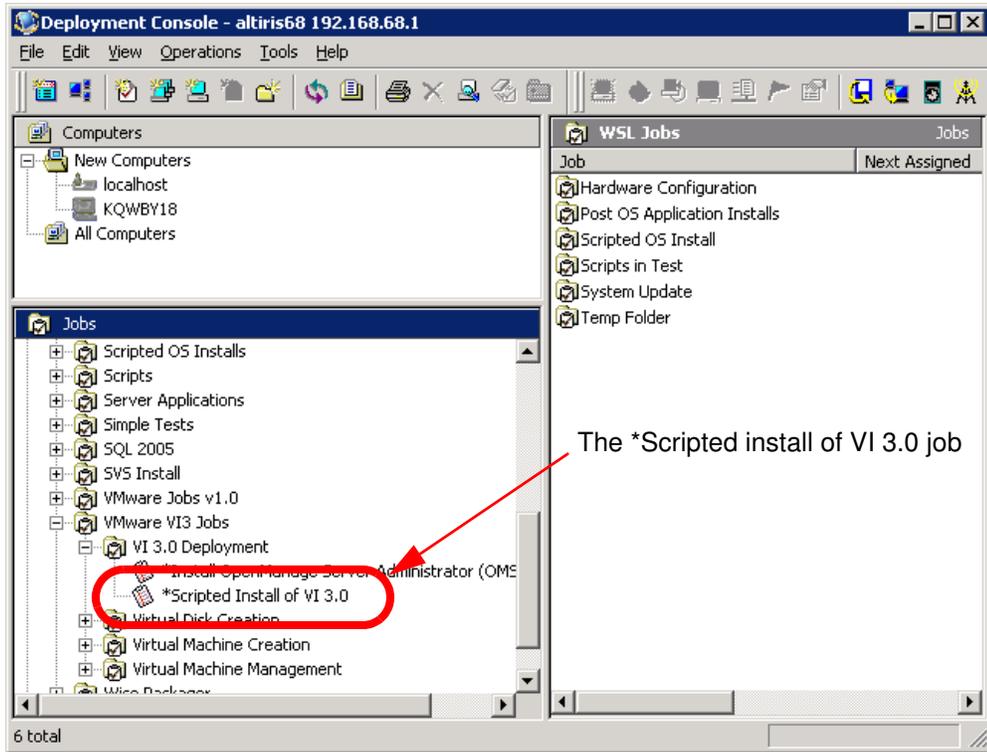
.\Samples\VMware VI3 Jobs\VI 3.0 Deployment\

Figure 1-15   The Deployment Console displaying the *Scripted Install of VI 3.0 job

The *Scripted install of VI 3.0 job contains four tasks:

1. **Distribute a DOS image**: This task uses the DOS_ONLY. IMG to create a temporary, 2 GB DR-DOS™ partition on the target computer's hard disk. The DR-DOS partition is used only for installation, and it's removed once the installation is completed.

Note:

To open the task in edit mode:

— From the Details pane of the Deployment Console, select the task, and then click the **Modify** button.

Make sure the check box for A**utomatically perform configuration task after completing this imaging task** is unchecked (Figure 1-16 on page 18).
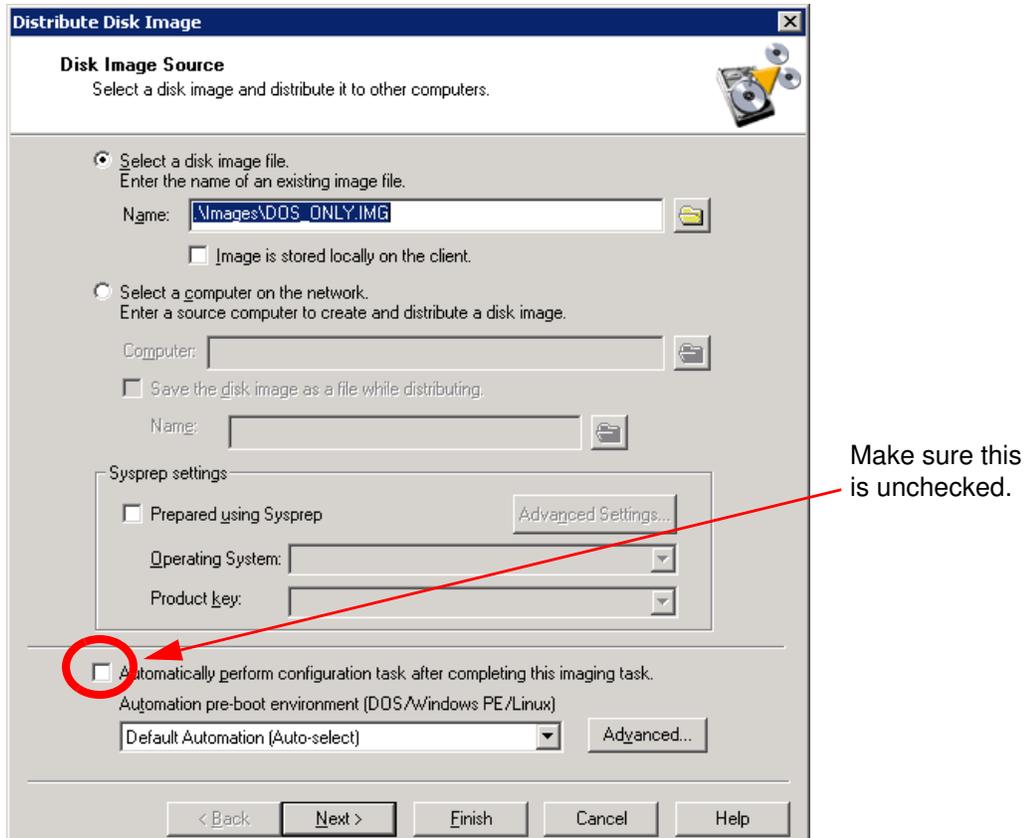

Make sure this is unchecked.

Figure 1-16   The Distribute DOS image task

> **Important:** The DOS_ONLY.IMG DR-DOS partition image that is used by default does not work properly on some older IBM System x servers. It may display the following error when it is used:
>
> `The partition is too big for this file system`
>
> If you experience this problem, use the FAT32 DR-DOS partition image supplied with Altiris Deployment Solution.
>
> See section 1.4.1, "Changing the DR-DOS partition image" on page 22 for details on changing the DR-DOS partition image.

2. **Reboot**: This task restarts the target computer, ensures that it has completed the image task, and that there is nothing in the target computer's memory.

3. **Prepare HD for a Network Scripted Install of VI 3.0**: This is a script task. It copies installation files to the target computer's DR-DOS partition so the kickstart installation can begin. The files required for installation are loadlin.exe (or linld.com), initrd.img, and vmlinuz.

   Loadlin.exe, initrd.img, and vmlinuz are included on the installation media. Loadlin.exe is in the .\dosutils directory. Vmlinuz and initrd.img are in the .\images\pxeboot directory. Linld.com is available on the Altiris Juice web site. See section 1.4.2, "Using linld.com" on page 24 for more information regarding linld.com.

   After the script copies the loadlin.exe (or linld.com), initrd.img, and vmlinuz files to the target computer's DR-DOS partition, it then copies the KS.CFG kickstart file to a

temporary directory in the Deployment Share for token replacement, which occurs in the fourth task.

Note: The kickstart file can be saved anywhere in the Deployment Share, as long as the third task is modified to point to the correct location.

After the script copies the files to the DR-DOS partition, the script creates an autoexec.bat file that will be used to launch the installation in step 4 (below).
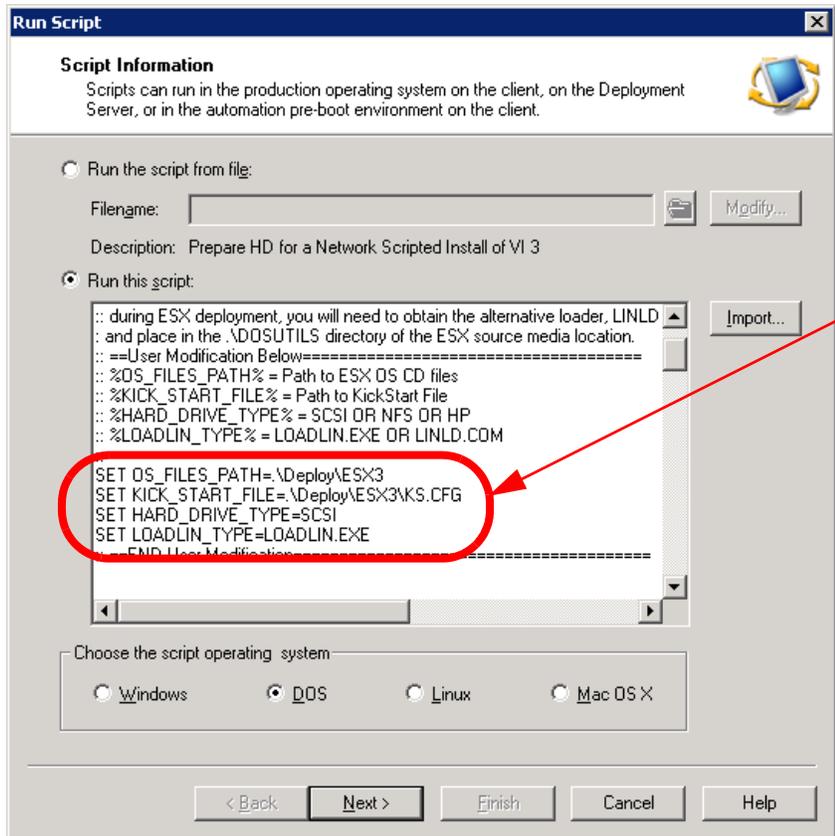
These variables must be modified to match your environment.

Figure 1-17   The Prepare HD for a Network Scripted Install of VI 3.0 task (before modification)

The user modification area of the script (see Figure 1-17) includes four environment variables. These variables are used to copy the required files to the target computer's DR-DOS partition, locate the kickstart file in the Deployment Share, and then create the autoexec.bat file. The variables are:

– **%OS_FILES_PATH%**

This variable is the path to the directory containing the ESX Server installation files in the Deployment Share. In this example the path is:

.\sgdeploy\os\esx301.

– **%KICK_START_FILE%**

This variable is the path to the kickstart file in the Deployment Share. In this example, the kickstart file is saved in the same location as the installation file, so the path is:

.\sgdeploy\os\esx301\ks.cfg

- **%HARD_DRIVE_TYPE%**

   This variable specifies whether the kickstart file is saved on the local disk, on a network file share, or if you are using an HP® brand server. If your target computer is an HP server, it must be specified using the %HARD_DRIVE_TYPE% variable so the Deployment Server can perform some special processing. In this example, the kickstart file will be copied to the target computer's DR-DOS partition so the default (SCSI) is fine.

- **%LOADLIN_TYPE%**

   This variable specifies the type of DOS-based Linux loader to use. There are two options: loadlin.exe (the default) or linld.com. Loadlin.exe is included on the ESX Server 3.0.1 installation CD. Linld.com must be downloaded from the Altiris Juice web site if you wish to use it. See section 1.4.2, "Using linld.com" on page 24 for instructions for using linld.com.

> **Important:** There is an issue running loadlin.exe on certain IBM System x servers. When using loadlin.exe, you may get the following error message when you attempt to deploy ESX Server:
>
> ```
> kernel BUG at apic.c:298!...<error codes>...Kernel panic: Fatal exception.
> ```
>
> If this occurs, use linld.com. You must place the linld.com file in the .\dosutils directory in the Deployment Share. In this example, it is the following directory:
>
> .\sgdeploy\os\esx301\dosutils\

After all modifications have been made, the script variables should look like Figure 1-18 on page 21.
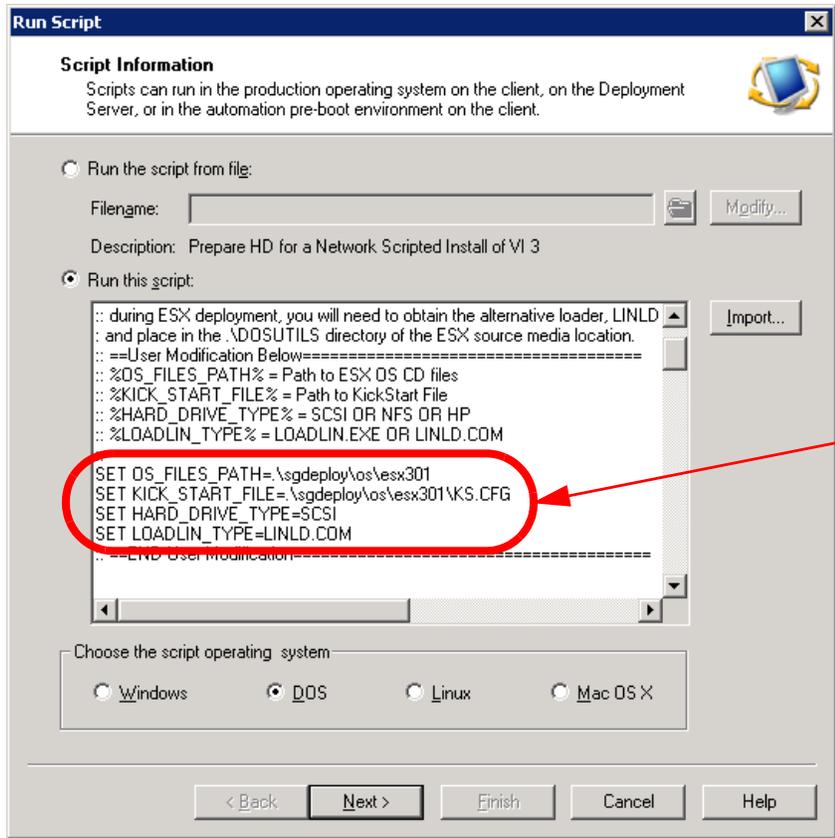
Figure 1-18   Prepare HD for a Network Scripted Install of VI 3.0 task (after modification)

4. **Perform Token Replacements and Launch Scripted Install**: This task performs several actions (see Figure 1-19 on page 22):

> **Note:** At the beginning of the script there are several REM lines (REM lines are remarks that are ignored by normal scripting engines). Although these lines are remark statements in normal scripting engines, the Altiris BootWorks™ engine is designed to ignore the "REM" portion of the statement and issue the commands regardless. No user modification is required for these remarked commands to be used.

– Unloads BootWorks to free sufficient memory for the installation.

– Performs token replacement on the kickstart file that was copied to a temporary directory in the Deployment Share during step 3. This replaces the tokens in the kickstart file with the configuration information from the Deployment Database if the target computer was pre-provisioned (see section 1.5, "Altiris tokens and server pre-provisioning" on page 24 for information about server pre-provisioning.)

– Makes the job successful regardless of the success or failure of the ESX Server installation.

– Removes any carriage return characters from the kickstart file (in case it was edited with a non-Linux-based text editor), and then copies the kickstart file from its temporary location in the Deployment Share to the DR-DOS partition on the target computer.

– Reboots the target computer.

> **Note:** Altiris token replacement is a method of using information stored in the Deployment Database to replace certain text variables in scripts, increasing the flexibility and versatility of the scripts.
>
> Please refer to Altiris Deployment Solution documentation for more information about tokens and the process of token replacement.
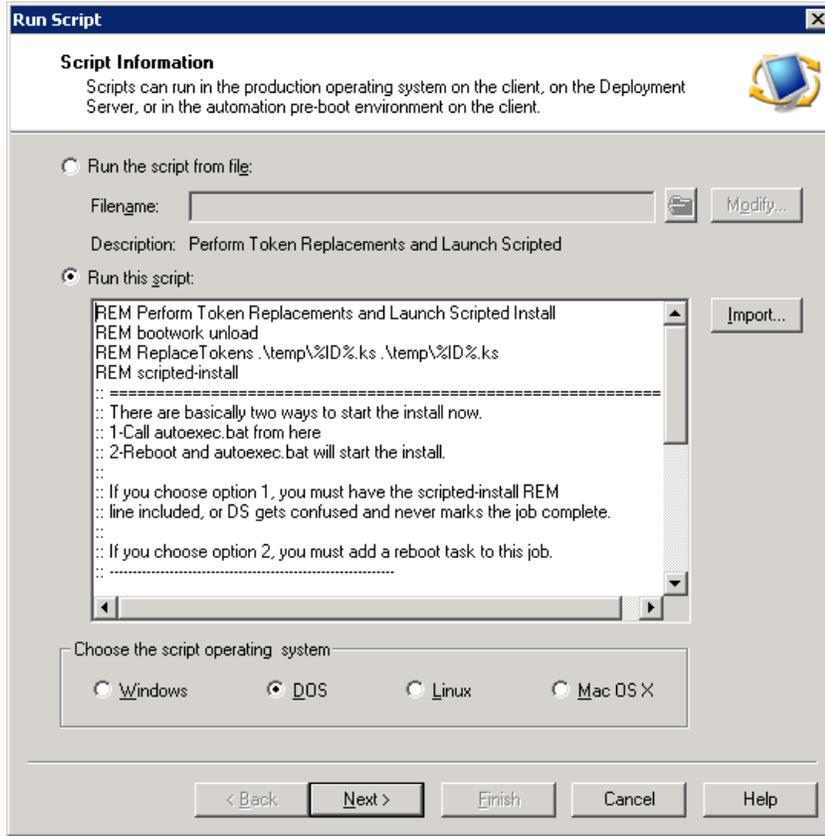

Figure 1-19   Perform Token Replacements and Launch Scripted Install

After the target computer reboots, the autoexec file runs and begins the installation process. Deployment Solution's part of the deployment process is now complete.

You can deploy your custom ESX Server 3.0.1 installation job by dragging and dropping the job onto any active computer or group of computers in the Computers pane of the Deployment Console.

1.4.1 Changing the DR-DOS partition image

Altiris Deployment Solution includes an alternate FAT32 DR-DOS partition image file for computers that cannot process the default FAT16 DR-DOS partition image. To use the FAT32 DR-DOS partition image, you must modify the first task of the *Scripted Install of VI 3.0 job (described in 1.4, "Creating a custom deployment job" on page 16).

To modify the first task of the *Scripted install of VI 3.0 job to use the FAT32 DR-DOS partition image:

1. From the Details pane of the Deployment Console, select the ***Scripted install of VI 3.0** job and click **Modify**. The task will look like that shown in Figure 1-20 on page 23
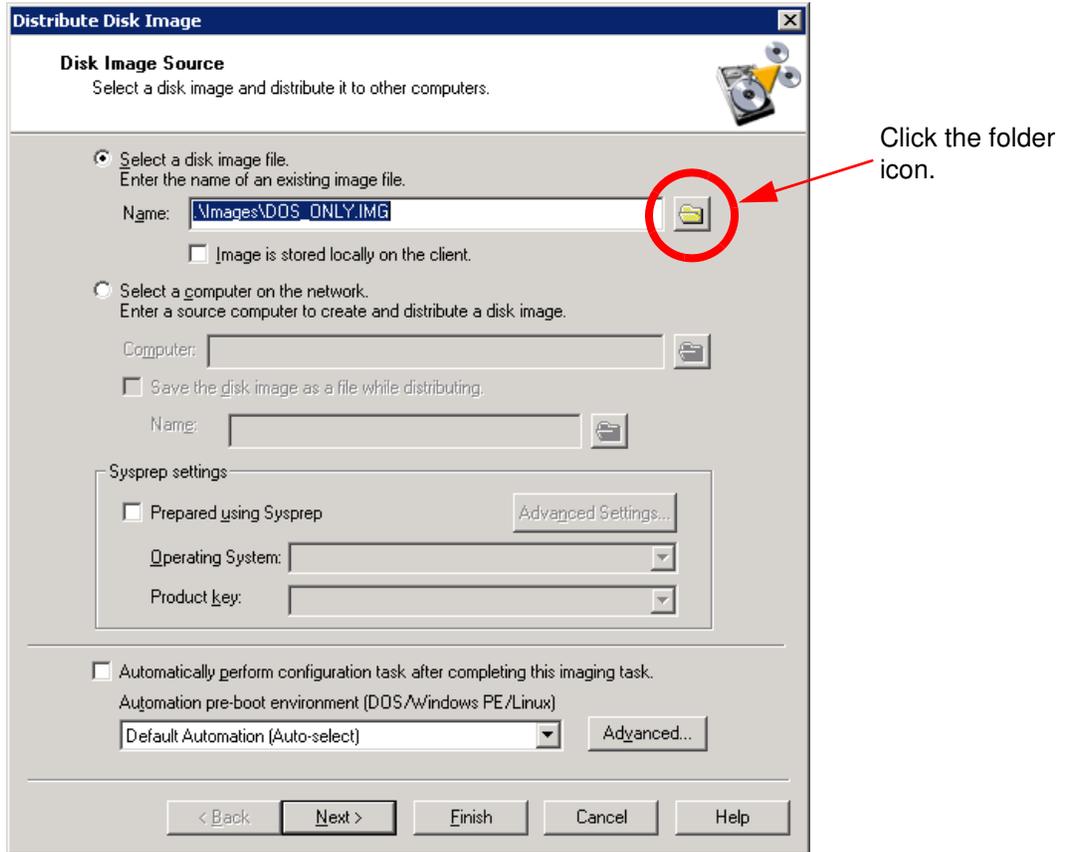

Figure 1-20   The Distribute Disk Image task

2. Click the folder icon and browse to the following directory in the Deployment Share:
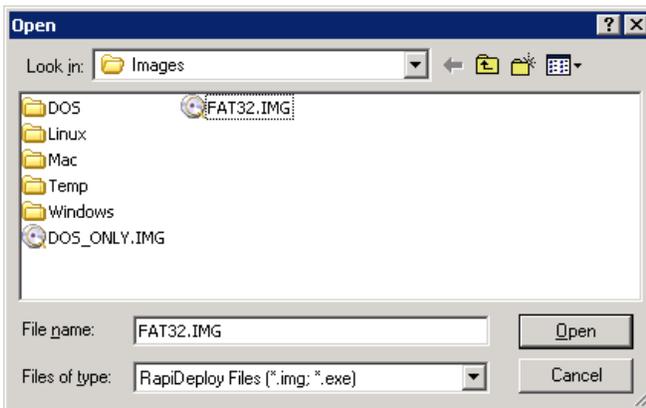
   .\Images\

Figure 1-21   The FAT32.IMG DR-DOS partition image file

3. Select the FAT32.IMG file, and then click **OK**

4. Click **Next,** and then click **Finish** to complete the FAT32.IMG selection

1.4.2 Using linld.com

The linld.com file is an alternative to loadlin.exe (a DOS-based Linux loader). Using linld.com is the preferred method of deploying ESX Server 3.0.1 to IBM System x servers, because certain IBM System x servers are incompatible with the Linux kernel used in loadlin.exe.

Linld.com can be downloaded from the following URL:

http://ibase.altiris.com/resources/ibm/other/linld.zip

After downloading and extracting the files from the linld.zip file, copy the linld.com file to the .\dosutils folder in the directory in the Deployment Share that contains the ESX Server installation files.

In this example the path is:

.\sgdeploy\os\esx301\dosutils

Once you have copied the linld.com file, the directory should look like that shown in Figure 1-22.
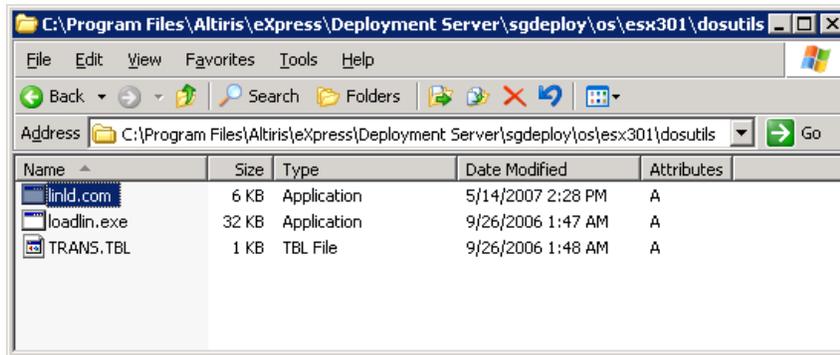

Figure 1-22   The dosutils directory with the linld.com file

Before deploying ESX Server, you must modify the third task of the *Scripted Install of VI 3.0 job:

1. From the Details pane of the Deployment Console, select the third task and click **Modify**

2. Scroll down the script until you see the following line:

   Set LOADLIN_TYPE=loadlin.exe

3. Replace loadlin.exe text with linld.com as shown here:

   Set LOADLIN_TYPE=linld.com

4. Click **Next**, and then click **Finish** to complete the process

1.5 Altiris tokens and server pre-provisioning

Server pre-provisioning is the process of populating the Deployment Database with values unique to each target computer (for example, a NETBIOS name) before the computer is discovered by the Deployment Server.

This enables administrators to configure computers and assign deployment jobs before the computers are connected to the network or powered up.

1.5.1 Tokens and Token Replacement

An Altiris token is a type of variable that can be replaced with unique data from the Deployment Database. The sample ESX Server kickstart file located in the .\Samples\VMware\ESX3 directory in the Deployment Share has many Altiris tokens placed throughout the file.

Each computer can have a unique value for each token. For example:

▶ **%NAME%**

This token stores the name of the computer being managed (as seen from the Deployment Console)

▶ **%DOMAIN%**

This token stores the Microsoft Domain to which a computer belongs.

Not every token in the Deployment Database will necessarily have a value assigned to it. Token values are dependent upon the configuration requirements for each individual computer.

Tokens are replaced with unique values during the token replacement process. The token replacement process is described below:

1. All the tokens in the original kickstart file are identified

2. The unique token values for each computer are located in the Deployment Database

3. A unique kickstart file is created for the target computer using the token values

4. The tokens are replaced by the values read from the Deployment Database

5. The kickstart file is saved with a unique name in a temporary directory specified in the deployment job

6. The new, unique kickstart file is copied to the target computer's DR-DOS partition and renamed back to its original name (KS.CFG)

When a target computer is discovered by the Deployment Server and has an ESX Server deployment job assigned to it, the token replacement process will find valid values in the Deployment Database if the target computer was pre-provisioned.

Sample Kickstart Tokens

The following line in the sample kickstart file contains three tokens:

```
network --device eth0 --bootproto static --ip=%NIC1IPADDR%
--netmask=%NIC1IPNETMASK% --hostname=%COMPNAME%
```

▶ %NIC1IPADDR% - The static IP address for NIC 1

▶ %NIC1NETMASK% - The network mask for NIC1

▶ %COMPNAME% - The hostname of the target computer

1.5.2 Server pre-provisioning

To pre-provision the target computer:

1. Right-click the computer pane of the Deployment Console, and then click **New Computer** from the menu

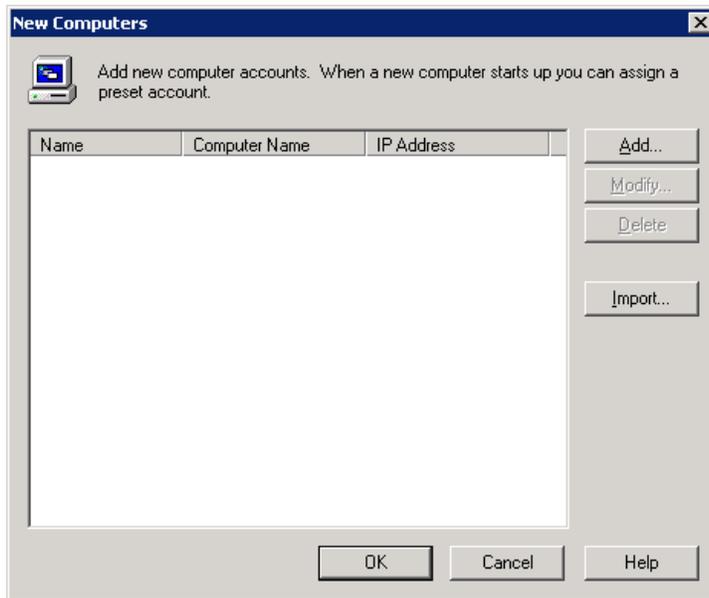2. When the New Computers dialog box appears, click **Add**

Figure 1-23   The New Computers dialog box

3. The New Computer Properties dialog box contains text fields that allow the administrator to set values for the target computer. These values will be stored in the Deployment Database.

    Figure 1-24 on page 27 shows the New Computer Properties dialog box with the General section shown.

    Note: Only fields directly applicable to ESX Server deployment are covered in this document. Please refer to Altiris Deployment Solution documentation for more information about available Altiris tokens.

    It is important to correctly enter the MAC address of the NIC that will be used to communicate with the Deployment Server. The Deployment Server uses the MAC address as a unique identifier for each target computer.

    –   The **Name** field contains the name the of target computer as it will be seen in the Deployment Console only. This is *not* the NetBIOS name of the target computer.

    –   The **Computer Name** field contains the NetBIOS name you want the target computer to have after the ESX Server deployment is completed.

    –   The **IP Address** field will be disabled initially on this page, until a valid IP address is given on the TCP/IP page (see step 4, below).
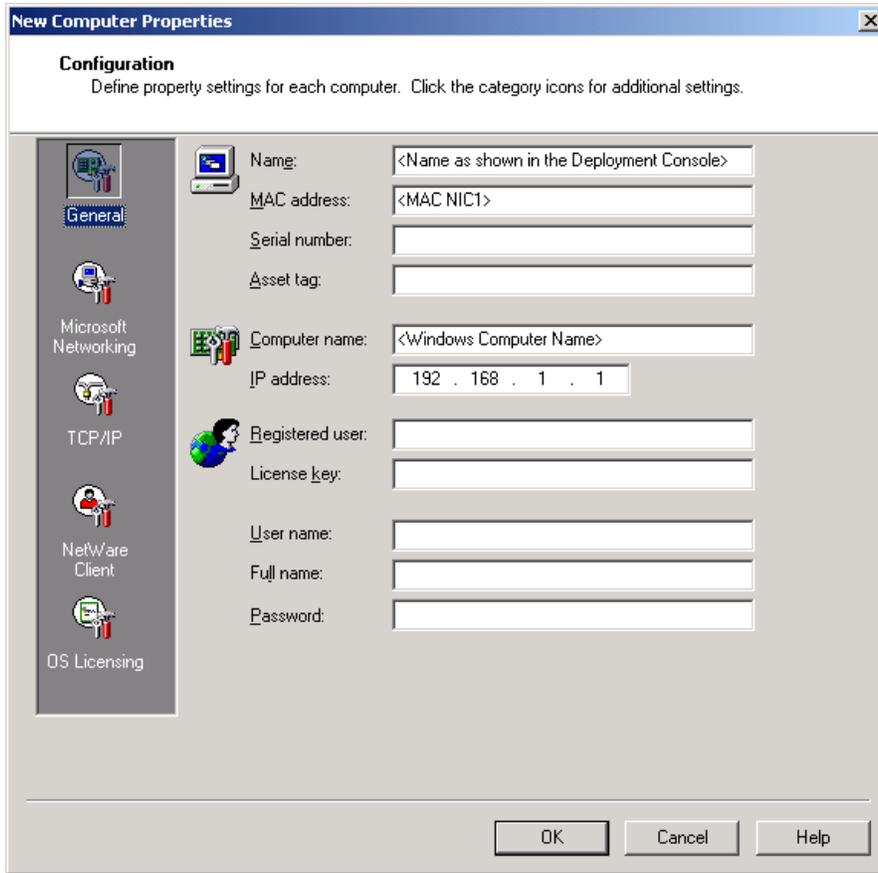
Figure 1-24   The General page of the New Computer Properties dialog box

4. From the New Computer Properties dialog box, click the **TCP/IP** icon to display the TCP/IP properties page (see Figure 1-25 on page 28).

    – The **Host Name** field contains the NetBios name of the target computer. This field will be pre-populated if a name was entered into the Name field on the General page of the New Computer Properties dialog box.

    – The **MAC Address** field contains the MAC address of the selected NIC. This field will be pre-populated if the MAC address was entered into the MAC address field on the General page of the New Computer Properties dialog box.

    To assign the NIC a static IP address to be used both before and after the ESX Server installation has completed, click **Assign a static IP address**. Type a valid IP address and network mask address. If required, also type the IP address for the gateway and DNS server into applicable fields.

Important: Assign the NIC an IP address from which it can access the web server, otherwise the installation will fail.
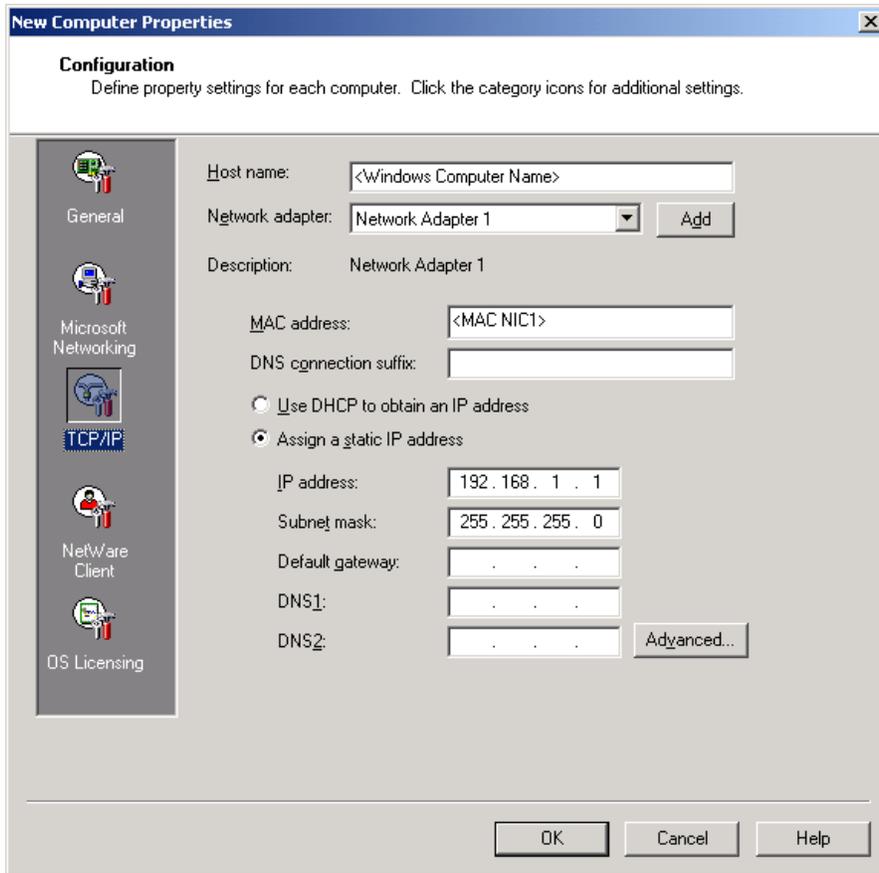
Figure 1-25 The TCP/IP page of the New Computer Properties dialog box

5. Click **OK** to add the pre-provisioned computer. The New Computers dialog box will now have a new entry for the new computer.
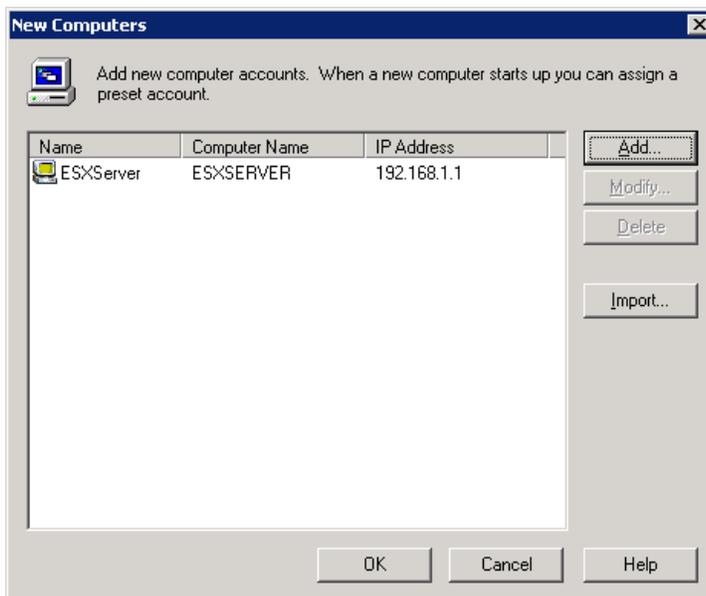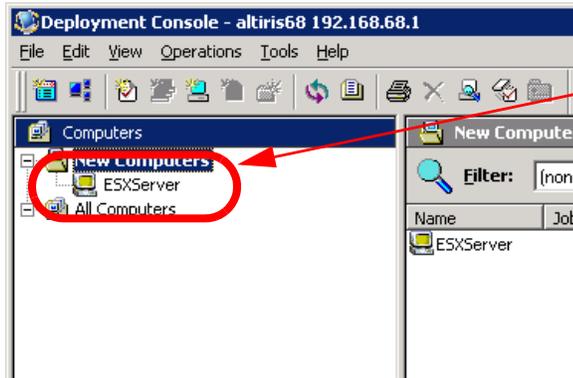

Figure 1-26 The New Computer dialog box displaying a pre-provisioned computer

6. Click **OK** to exit the New Computer dialog box. The Computers pane of the Deployment Console now shows a pre-provisioned computer to which you can assign jobs.

A pre-provisioned computer. Notice the yellow color of the computer icon.

Figure 1-27   The Computers pane of the Deployment Console displaying a pre-provisioned computer

When the target computer is discovered by the Deployment Server (via PXE boot or a boot disk), it will identify itself as being pre-provisioned. Any jobs assigned to the pre-provisioned computer will execute immediately.

When the Scripted Install of VI 3.0 job initiates token replacement on the kickstart file, it will find the values entered in the Deployment Database, and replace the tokens in the file.

1.6 References

Altiris Deployment Solution 6.8 SP1 Deployment and Migration Guide

Deployment using Altiris on IBM System x and BladeCenter Servers, Author: Roland Mueller

Altiris Install of VMWare ESX 3.0.1 on IBM BladeCenter, Author: Robert Jakes

Installation and Upgrade Guide ESX 3.0.1 and VirtualCenter 2.0.1

Linux Red Hat documentation: `http://www.redhat.com/docs/manuals/linux/`