

# Novell OES2 AutoYaST Server Configuration

prepared for

## Novell OES2 Linux Customers

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# Contents

<b><u>Installing &amp; Configuring an OES2 AutoYaST Server</u></b> .....	<b>1</b>
<u>Network (Remote) Installation</u> .....	1
<u>Prepare an AutoYaST Configuration File</u> .....	1
<u>Set Up a Network Installation Server Using YaST</u> .....	3
<u>Configure TFTP Services</u> .....	4
<u>Configure DHCP</u> .....	7
<u>Test the Installation</u> .....	8
<b><u>Post Deployment</u></b> .....	<b>10</b>
<u>Check the AutoYaST Deployment Image</u> .....	10
<b><u>Network Configuration Script</u></b> .....	<b>12</b>
<u>AutoYaST Configuration Script</u> .....	12
<b><u>Online Documentation</u></b> .....	<b>15</b>
<u>AutoYaST Web Links</u> .....	15



# Installing & Configuring an OES2 AutoYaST Server

Novell Open Enterprise Server 2 is based on and incorporates SUSE Linux Enterprise Server 10 SP1 as the core operating system. OES 2 service components are incorporated as “add-ons.” In other words:

OES2 Linux = SUSE Linux Enterprise Server 10 SP1 + Novell OES2 Linux Components

This document provides information about using a network, or remote, installation method for installing OES 2. Use it in conjunction with the following:

- [Installing and Configuring Samba on Open Enterprise Server 2 \(OES2\)](#)
- [Installing Open Enterprise Server 2 into an Existing Tree](#)
- [Setting Up Dynamic Storage Technology with Open Enterprise Server 2 \(OES2\)](#)

SUSE Linux Enterprise® servers can be installed in several different ways. In addition to the usual CD or DVD installation, you can choose from various network-based approaches or even take a completely hands-off approach.

**Note:** In the following sections, the system that will hold the new SUSE Linux Enterprise installation is referred to as the target system or installation target. The term installation source is used for all sources of installation data. This includes physical media, such as CD and DVD, and network servers distributing the installation data across the network.

To install OES2 with AutoYaST using a network-based installation method, you will need to complete the following:

- Prepare an AutoYaST configuration file
- Set up a network installation source
- Configure TFTP
- Configure DHCP
- Test the installation

Brief instructions for completing each of these tasks are included below.

## Prepare an AutoYaST Configuration File

AutoYaST is the technology used by SUSE Linux systems to accomplish unattended (remote) installations. With AutoYaST, system configuration parameters such as partitioning, software selections, and X windows are specified in and read from an XML file. The XML file can be created and edited with any text or XML editor, but using the Autoinstallation YaST module makes setting up the XML file easier.

To create a base AutoYaST configuration file, complete the following:

1. Select YaST and provide the root password when prompted.

2. Select `Misc > Autoinstallation`.

The Autoinstallation window appears, as shown in Figure 1.

**Figure 1: Use the Autoinstallation YaST Module to Create a Base XML File**



Once you have accessed the Autoinstallation module, use the left menu to navigate and the right window to set configuration options.

**Note:** Creating a complete AutoYaST configuration file can be a complex process and is not explained here. Extensive documentation can be found at </usr/share/doc/packages/autoyast2/html/index.html>, or online.

3. When creating the AutoYaST configuration file, make sure you select the proper software settings. Do the following:
  - a. In the Autoinstallation module, expand `Software` and then select `Package Selection`.
  - b. In the `Package Selection` window, select `Configure`.
  - c. In the `Software Selection` window, select the pattern you would like to change.
  - d. If additional packages are needed, select `Detailed Selection` and then select the desired packages.
  - e. Select `Next`.
4. Once the configuration has been set, save the configuration file by selecting `File > Save`.

To set or modify the configuration parameters manually, open the AutoYaST configuration file in a text or XML editor and insert any needed configuration parameters before the `</configure>` tag. You can edit the file at any time using the `File > Open File` option.

## Set Up a Network Installation Server Using YaST

YaST offers a graphical tool for creating network installation sources. It supports HTTP, FTP, and NFS network installation servers.

1. Log in as root to the machine that will act as installation server.
2. Start `YaST > Miscellaneous > Installation Server`.
3. Select the server type (HTTP, FTP, or NFS).

The selected server service is started automatically every time the system starts.

If a service of the type selected is already running on your system and you want to configure it manually, deactivate the automatic configuration of the server service with `Do Not Configure Any Network Services`. In either case, you will need to define the directory in which the installation data should be made available on the server.

4. Configure the required server type. This step relates to the automatic configuration of server services. It is skipped if you deactivate the automatic configuration.
  - a. Define an alias for the root directory of the FTP or HTTP server on which the installation data should be found.

The installation source will later be located under `ftp://Server-IP/Alias/Name` (FTP) or under `http://Server-IP/Alias/Name` (HTTP).  
Name stands for the name of the installation source, which is defined in Step 5.
  - b. Conditional: If you selected NFS in the previous step, define wild cards and export options. The NFS server will be accessible under `nfs://Server-IP/Name`.
  - c. Make sure the firewall settings for your server system allow traffic on the ports for HTTP, NFS, and FTP. If they currently do not, start the YaST firewall module and open the respective ports.
5. Configure the installation source.
  - a. Before the installation media are copied to their destination, define the name of the installation source (ideally, use an easily remembered abbreviation of the product and version).
  - b. YaST allows you to use ISO images of the media instead of copies of the installation CDs. If you use this option, activate the relevant check box and specify the directory path under which the ISO files can be found locally.
  - c. Depending on the products to be distributed using this installation server, you may need to provide additional add-on CDs or service pack CDs. These should be added as extra installation sources.
  - d. To announce your installation server in the network via OpenSLP, activate the appropriate option.

**Tip:** Consider announcing your installation source via OpenSLP if your network setup supports this option. This saves you from entering the network installation path on every target machine. Instead, the target systems are booted using the SLP boot option and find the network installation source without any further configuration.

#### 6. Upload the installation data.

The most lengthy step in configuring an installation server is copying the actual installation CDs.

- a. Insert the media in the sequence requested by YaST and wait for the copying procedure to complete.
- b. When the sources have been fully copied, return to the overview of existing information sources and close the configuration by selecting `Finish`.

Your installation server is now fully configured and ready for service. It is automatically started every time the system is started. No further intervention is required.

You only need to configure and start this service manually if you have deactivated the automatic configuration of the selected network service with YaST as an initial step.

- To deactivate an installation source, select the installation source to be removed and then select `Delete`.
- To deactivate the network service, use the respective YaST module.

**Note:** If your installation server needs to provide installation data for more than one product or product version, start the YaST installation server module and select `Add` in the overview of existing installation sources to configure the new installation source.

## Configure TFTP Services

To boot from the network, a tFTP server needs to be set up to deliver the boot image. When the server boots, DHCP will deliver the name of a server and the location on that server of the boot image to be retrieved.

To set up OES to provide the boot image, complete the following:

1. Set up the TFTP server.
  - a. In YaST, select `Network Services > TFTP Server`.
  - b. In `TFTP Server Configuration`, select `Enable`.
  - c. In `TFTP Server Configuration`, select `Browse`.
  - d. In the `Browse` window, create a folder in / (root) named `tftpboot`.
  - e. Select `tftpboot`, and then select `OK`. The boot image directory should now be `/tftpboot/`.
  - f. Select `Finish`.
2. Create the boot image in the `/tftpboot` directory.

- a. Insert SLES10 sp1 CD 1 into the CD drive and change directories to boot/loader (e.g. `#cd /media/cdrom/boot/loader`).
- b. Copy the `linux` and `initrd` files to the `/tftpboot` directory (e.g. `#cp linux initrd /tftpboot`).

**Note:** You will need to complete this procedure for each OS version you will be making available through PXE (e.g., 32 and 64 bit versions), so the best approach is to copy `linux` and `initrd` to the `/tftpboot` directory using names that can be assigned to their respective OS (e.g., `initrd_sles10sp1_32bit`).

3. Using YaST, install the `syslinux` package.

The `syslinux` package contains the pxe boot image.

- a. Copy the pxe boot image, `pxelinux.0`, to `/tftpboot`. (e.g. `#cp /usr/share/syslinux/pxelinux.0 /tftpboot`).
- b. Change directories to `/tftpboot` (e.g. `#cd /tftpboot`).
- c. Create a directory under `/tftpboot` called `pxelinux.cfg` (e.g. `#mkdir pxelinux.cfg`).
- d. Change directories to `pxelinux.cfg` and create a default configuration file called `default` (e.g. `#cd pxelinux.cfg ; touch default`).
- e. Edit the default file and add the following text:

```
#default
        label linux
        kernel linux
        append initrd=initrd ramdisk_size=65536
        install=nfs://192.168.1.3/installroot/oes
        autoyast=nfs://192.168.1.3/installroot/oes-ay.xml
```

**Note:** All of the text after "append" is one line. Also, be sure to change the install parameter to point to the install source server and the AutoYaST parameter to point to the AutoYaST configuration file.

When the new system boots, it will connect to the tFTP service to get its boot image as defined in DHCP. The new system will also look in the `pxelinux.cfg` folder for the default file. The default file specifies which kernel to boot and appends the options indicating where the installation media and the AutoYaST control file are located.

Note that you can specify any other options normally put in the "Boot Options" field of a regular SUSE install here.

### Sample `pxelinux.cfg` File

A sample `pxelinux.cfg` file is included below:

**Note:** This file has been customized to include a graphical menu instead of text.

```
## Start of pxelinux.cfg file
MENU TITLE <company name>, Novell AutoYaST PXE BOOT MENU
```

```
##
## settings for the simple menu system
##
DEFAULT vesamenu.c32
PROMPT 0

##
## boot options, ^means hotkey
##
    label 1
        MENU LABEL Hard disk
        localboot 0x80

    label 2
        MENU LABEL SLES10 SP1 32 Bits - Manual Installation
        MENU PASSWD novell
        kernel sles10sp1_32bit_linux
        append initrd=sles10sp1_32bit_initrd splash=verbose
install=http://164.226.195.33/autoyast/sles10-sp1-i386
#append is one line only

    label 3
        MENU LABEL SLES10 SP1 32 Bits - Auto Install - HP DL385
        MENU PASSWD novell
        kernel sles10sp1_32bit_linux
        append initrd=sles10sp1_32bit_initrd splash=verbose
install=http://164.226.195.33/autoyast/sles10-sp1-i386
autoyast=http://164.226.178.79/autoyast/xml/autoinstdl385.xml
#append is one line only

    label 4
        MENU LABEL SLES10 SP1 64 Bits - AutoYaST Install - HP
DL385
        MENU PASSWD novell
        kernel sles10sp1_64bit_linux
        append initrd=sles10sp1_64bit_initrd splash=verbose
install=http://164.226.195.33/autoyast/sles10-sp1-x86\_64/
autoyast=http://164.226.195.33/autoyast/xml/autoinstdl385.xml

    label 5
        MENU LABEL SLES10 SP1 64 Bits - AutoYaST Install - HP
DL365
        MENU PASSWD novell
        kernel sles10sp1_64bit_linux
        append initrd=sles10sp1_64bit_initrd ramdisk_size=65536
vga=791 splash=verbose
install=http://164.226.195.33/autoyast/sles10-sp1-x86\_64/
autoyast=http://164.226.195.33/autoyast/xml/autoinstdl365.xml
#append is one line only

    label 6
        MENU LABEL SLED10 SP1 32 Bits - Manual Install
        MENU PASSWD novell
        kernel sled10sp1_32bit_linux
        append initrd=sled10sp1_32bit_initrd dhcp=1
ramdisk_size=65536 vga=791 splash=verbose
install=http://164.226.195.33/autoyast/sled10-sp1-i386/

    label 7
```

```

        MENU LABEL SLED10 SP1 32 Bits - AutoYaST Install
        MENU PASSWD novell
        kernel sled10sp1_32bit_linux
        append initrd=sled10sp1_32bit_initrd dhcp=1
        ramdisk_size=65536 vga=791 splash=verbose
        install=http://164.226.195.33/autoyast/sled10-sp1-i386/
        autoyast=http://164.226.195.33/autoyast/xml/sled10splautoyast.xml

label 8
        MENU LABEL MS Windows XP
        MENU PASSWD novell
        kernel winxp.0

##
## various settings
##
MENU BACKGROUND bg.png
NOESCAPE 1
ALLOWOPTIONS 0
timeout 600

menu color title      1;31;49      #eeff1010 #cc553333 std
menu color sel        7;37;40      #ff000000 #bbaa9999 all
menu color border     30;44        #ffffffff #00000000 std
menu color pwdheader  31;47        #eeff1010 #20ffffff std

        ## End of pxelinux.cfg file

```

Make sure the following files are included in the `/tftpboot` directory:

- `bg.png` (background picture)
- `vesamenu.c32` (allows you to display menus in graphical mode with background jpg/png images)

## Configure DHCP

The network DHCP server needs to be configured to deliver two items: the address of the tFTP server and the PXE boot image filename.

To add these items, complete the following:

1. Start YaST and select `Network Services > DHCP Server`.
2. Select `Expert Options`, and then select `Yes`.
3. In the `Configured Declarations` window, select the subnet where the new system will be located and select `Edit`.
4. In the `Subnet Configuration` window, add an option and select `filename` as the option to add. The `filename` option value should be the name of the pxe boot image file, in this example, `pxelinux.0`. Add another option, `next-server`, and set its value to the IP address of the tFTP server.
5. Select `OK`.
6. Select `Finish` to complete the DHCP server configuration.

You can check the <company name> /etc/dhcpd.conf file below:

```
option domain-name "company domain name";
option domain-name-servers (insert server IP addresses);
option routers <insert IP address of option routers>;
default-lease-time 400;
ddns-update-style none;
allow booting;
allow bootp;
subnet 164.226.195.0 netmask 255.255.255.0
{
    range 164.226.195.120 164.226.195.125;
    default-lease-time 10;
    max-lease-time 172800;
    next-server 164.226.195.33;
    filename "pxelinux.0";
}
```

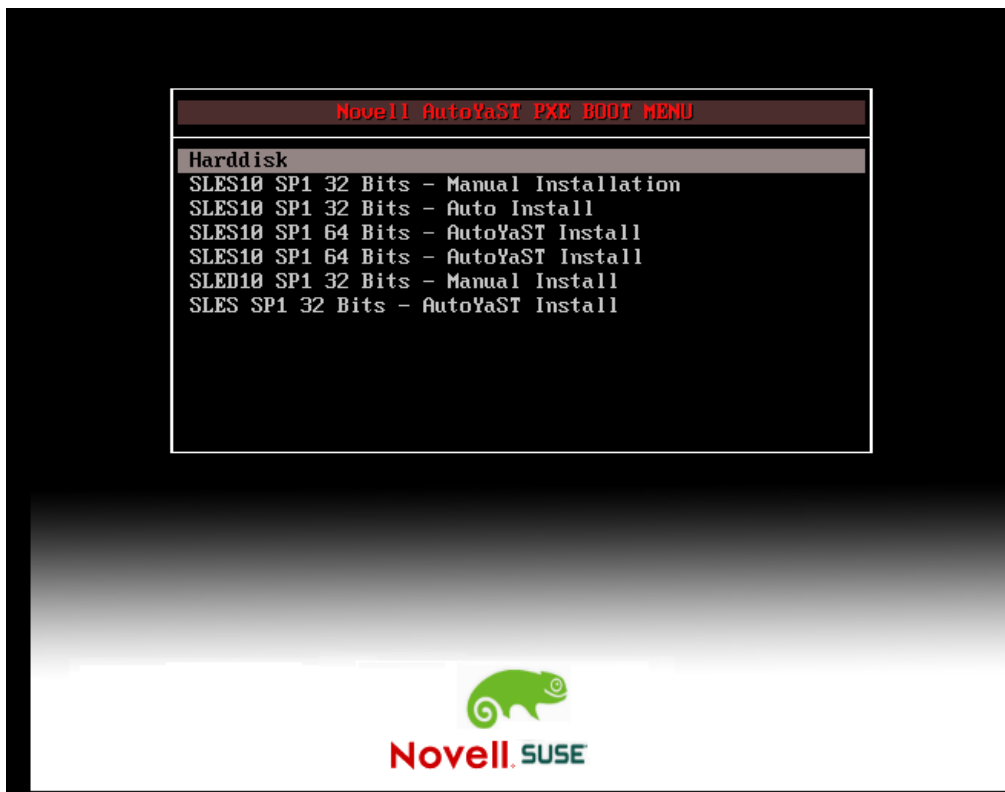
## Test the Installation

To test the installation, boot a machine that is PXE boot capable. When the machine boots, make sure it boots from the network, and then verify the following DHCP server operation:

- Make sure the PXE boot finds the DHCP server.
- Make sure the DHCP server delivers the network boot information.

The figure below shows a successful PXE boot.

**Figure 2: Sample AutoYaST PXE Boot Menu**



# Post Deployment

## Check the AutoYaST Deployment Image

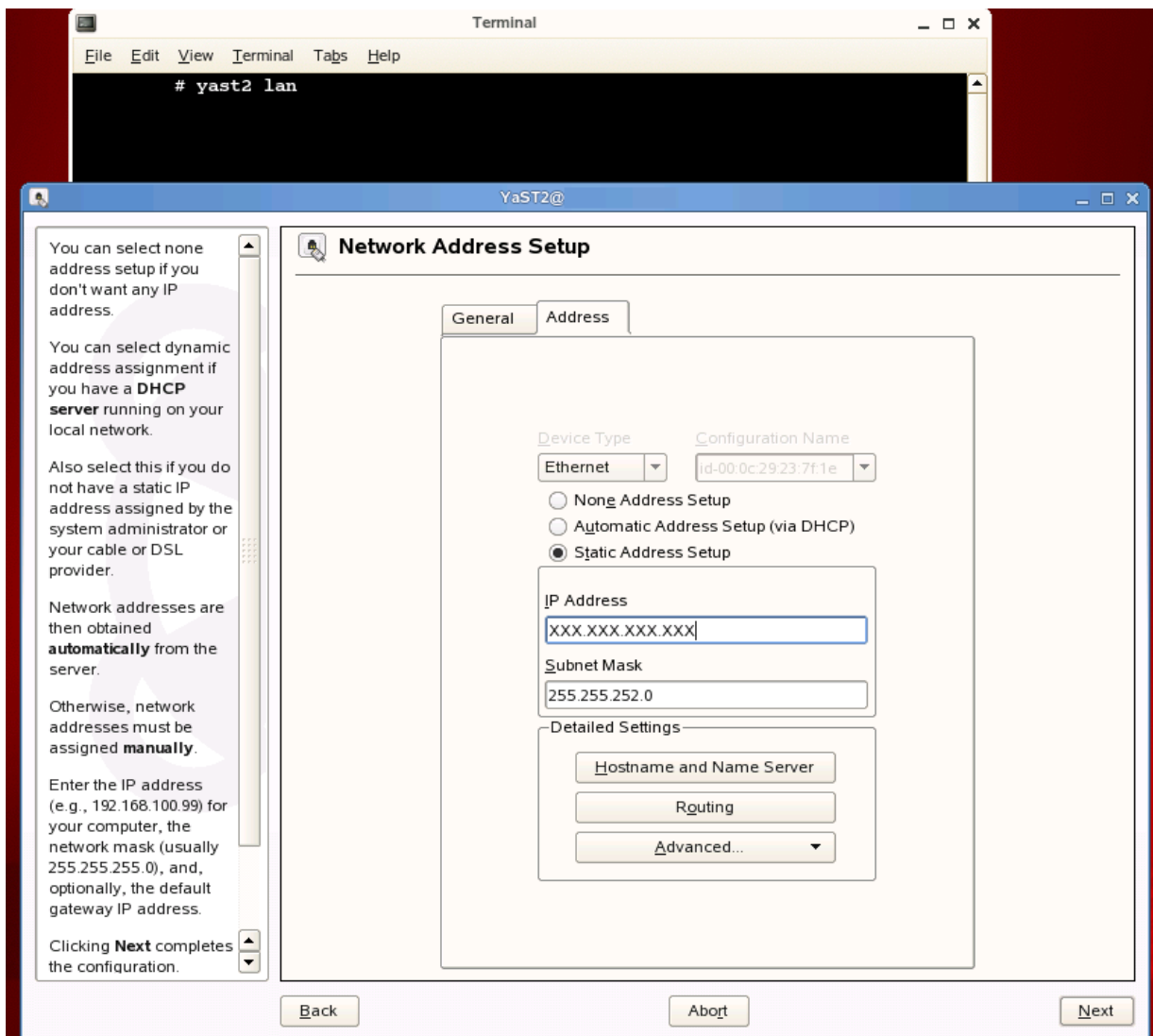
After installing the new OS using AutoYaST, the following items need to be checked and changed where necessary:

### DHCP

- Hostname: make sure you have an unique hostname and IP address.
- IP address

You can use the “yast2 lan” command to change the above items as illustrated below.

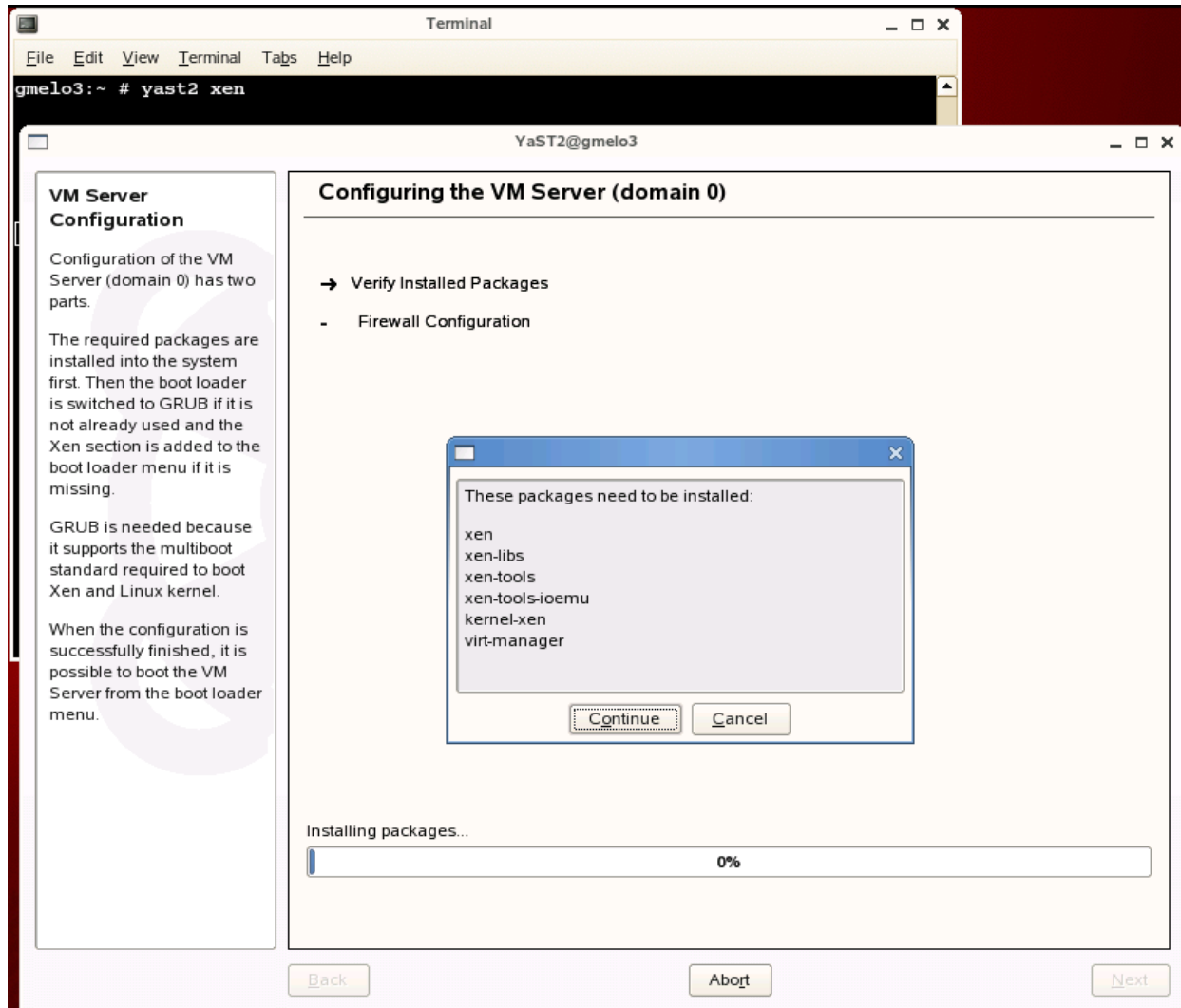
Figure 3: Changing the Hostname and IP Address Using yast2 lan



## XEN

You can also use the “yast2 xen” command to check XEN as shown below.

**Figure 4: Checking XEN Packages with YaST2**



Make sure the packages described on this screen are installed correctly.

# Network Configuration Script

## AutoYaST Configuration Script

If you have an environment in which you can use a single `Autoinst.xml` for setting up your systems, and you want them all to have different static IP addresses for one Active Ethernet interface, then the following script can help you accomplish this goal.

Two assumptions are implied when using this script.

1. DNS is defined for each host that is being set up with `/Autoinst.xml`.
2. DHCP is set up so that each host being set up with this script/`Autoinst.xml` has a static host definition defined in the `dhcpd.conf`.

Here is an example of a static host definition:

```
group test{
# Hosts List.
host test-host1 { fixed-address 172.18.0.100; hardware ethernet
00:11:22:33:44:55; }
host test-host2 { fixed-address 172.18.0.101; hardware ethernet
00:22:99:88:77:66; }
}
```

This script takes the dynamic address information it receives and makes it into a static configuration. This script needs to be executed at a point during the installation that it won't interfere with the rest of the install, for example, during the Init Scripts element of the AutoYaST xml.

You can find references to the syntax for this element in the following locations:

- SLES 10 AutoYaST Documentation  
HTML: <http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/>
- Latest AutoYaST Documentation  
<http://www.suse.de/~ug/>

## Script:

Copy the text below and paste it into the Init Scripts element of your `Autoinst.xml`.

```
#!/bin/bash
#network_setup.sh

### Disable IPV6 - comment this line out if you don't want to
disable IPV6
echo 'install ipv6 /bin/true' >> /etc/modprobe.conf.local

### Variables to Calculate Network Configuration Settings for a
static configuration
ACTIVE_INTERFACE=`/sbin/ifconfig | grep eth | awk '{print $1}'`
IP_ADDRESS=`/sbin/ifconfig $ACTIVE_INTERFACE | grep 'inet addr' |
awk '{print $2}' | sed 's/addr://'`
NETMASK=`/sbin/ifconfig $ACTIVE_INTERFACE | grep 'inet addr' | awk
'{print $4}' | sed 's/Mask://'`
```

```

BROADCAST=`/sbin/ifconfig $ACTIVE_INTERFACE | grep Bcast: | awk
'{ print $3 }' | sed 's/Bcast:/'`
NETWORK=`/sbin/ip route list | grep $IP_ADDRESS | awk '{ print $1 }'
| sed 's/\[[1-9]\[[1-9]\]'`
GATEWAY=`/sbin/route | grep default | awk '{print $2}'`
HOSTNAME=`/usr/bin/host $IP_ADDRESS | awk '{print $5}' | sed
'$s/.$//'`

### Setup HOSTNAME
echo "$HOSTNAME" > /etc/HOSTNAME

### Setup Gateway Address
echo "default $GATEWAY - -" > /etc/sysconfig/network/routes

### Setup /etc/hosts with correct host information
HOST=`/usr/bin/host $IP_ADDRESS | awk '{print $5}' | sed '$s/.$//' |
cut -d "." -f 1`
echo "$IP_ADDRESS    $HOSTNAME $HOST" >> /etc/hosts

### Network configuration file rewrite for static configuration

INT_CONF_FILE=/etc/sysconfig/network/ifcfg-eth-id-`ifconfig eth0 |
grep HWaddr | awk '{ print $5 }' | perl -ne '$var=$_; print
lc($var) `

echo 'DEVICE=eth0' > $INT_CONF_FILE
echo 'BOOTPROTO=static' >> $INT_CONF_FILE
echo "IPADDR=$IP_ADDRESS" >> $INT_CONF_FILE
echo "NETMASK=$NETMASK" >> $INT_CONF_FILE
echo "BROADCAST=$BROADCAST" >> $INT_CONF_FILE
echo "NETWORK=$NETWORK" >> $INT_CONF_FILE
echo 'STARTMODE=onboot' >> $INT_CONF_FILE
echo 'TYPE=Ethernet' >> $INT_CONF_FILE
### Restart Network
/etc/init.d/network restart

```

Once this script has been copied into the Autoinst.xml in the Init Scripts element it will look like the example below.

```

<scripts>
  <init-scripts config:type="list">
    <listentry>
      <filename>network_setup</filename>
      <interpreter>shell</interpreter>
      <source><![CDATA[#!/bin/bash
### Disable ipv6
echo 'install ipv6 /bin/true' >> /etc/modprobe.conf.local

### Variables to Calculate Network Configuration Settings for a static
configuration ###
ACTIVE_INTERFACE=`/sbin/ifconfig | grep eth | awk '{print $1}'`
IP_ADDRESS=`/sbin/ifconfig $ACTIVE_INTERFACE | grep 'inet addr' | awk
'{print $2}' | sed 's/addr:/'`
NETMASK=`/sbin/ifconfig $ACTIVE_INTERFACE | grep 'inet addr' | awk
'{print $4}' | sed 's/Mask:/'`
BROADCAST=`/sbin/ifconfig $ACTIVE_INTERFACE | grep Bcast: | awk '{ print
$3 }' | sed 's/Bcast:/'`
NETWORK=`/sbin/ip route list | grep $IP_ADDRESS | awk '{ print $1 }' |
sed 's/\[[1-9]\[[1-9]\]'`
GATEWAY=`/sbin/route | grep default | awk '{print $2}'`

```

```

HOSTNAME=`/usr/bin/host $IP_ADDRESS | awk '{print $5}' | sed 's/.$//'`

### Setup HOSTNAME
echo "$HOSTNAME" > /etc/HOSTNAME

### Setup Gateway Address
echo "default $GATEWAY - -" > /etc/sysconfig/network/routes

### Setup /etc/hosts with correct host information
HOST=`/usr/bin/host $IP_ADDRESS | awk '{print $5}' | sed 's/.$//' | cut
-d "." -f 1`
echo "$IP_ADDRESS $HOSTNAME $HOST" >> /etc/hosts

### Network configuration file rewrite for static configuration

INT_CONF_FILE=/etc/sysconfig/network/ifcfg-eth-id-`ifconfig eth0 | grep
HWaddr | awk '{ print $5 }' | perl -ne '$var=$_; print lc($var)'`

echo 'DEVICE=eth0' > $INT_CONF_FILE
echo 'BOOTPROTO=static' >> $INT_CONF_FILE
echo "IPADDR=$IP_ADDRESS" >> $INT_CONF_FILE
echo "NETMASK=$NETMASK" >> $INT_CONF_FILE
echo "BROADCAST=$BROADCAST" >> $INT_CONF_FILE
echo "NETWORK=$NETWORK" >> $INT_CONF_FILE
echo 'STARTMODE=onboot' >> $INT_CONF_FILE
echo 'TYPE=Ethernet' >> $INT_CONF_FILE

### Restart Network
/etc/init.d/network restart
]]</source>
</listentry>
</init-scripts>
</scripts>

```

Now run through an AutoYaST installation to test the script. If you run into trouble, check the installation logs at `/var/adm/YaST/.`

**Note:** This script can be adapted in order to auto-configure multiple Ethernet Interfaces.

# Online Documentation

## AutoYaST Web Links

- AutoYaST  
[http://www.suse.de/~ug/autoyast\\_doc/index.html](http://www.suse.de/~ug/autoyast_doc/index.html)
- Autoyast installation using a network installation source  
[http://en.opensuse.org/Autoyast\\_installation\\_using\\_a\\_network\\_installation\\_source](http://en.opensuse.org/Autoyast_installation_using_a_network_installation_source)
- Automating Installations with AutoYaST  
[http://support.novell.com/techcenter/articles/nc2006\\_03a.html](http://support.novell.com/techcenter/articles/nc2006_03a.html)
- AutoYaST: Network Auto-Configuration Script  
<http://www.novell.com/coolsolutions/feature/18955.html>
- Novell SLES 10 Documentation – Remote Installation  
[http://www.novell.com/documentation/sles10/sles\\_admin/data/cha\\_deployment\\_remoteinst.html](http://www.novell.com/documentation/sles10/sles_admin/data/cha_deployment_remoteinst.html)

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