

Installation Guide

SUSE Linux Enterprise Server for SAP Enterprise Search

written by



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**Linux / Open Source Consulting, Training,
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1 Introduction

The following guide refers to the former version „SUSE Linux Enterprise Server for SAP Applications" (ISO image: SLES-10-SP3-SAP-APL-x86_64-GM-DVD1.iso), which is based on the SUSE Linux Enterprise Server 10 Service Pack 3. The download link can be found in chapter 4 Sources.

The DVD contains the following products:

- SUSE Linux Enterprise Server for SAP Business All-in-One
- SUSE Linux Enterprise Server for SAP NetWeaver Enterprise Search (supporting multi-node/clustered SAP set ups).

The DVD image contains the standard SUSE Linux Enterprise Server installation. Additionally, this image provides tools which allow the integrated, automated, standardized and optimized installation of SAP applications.

Find additional advice and information on installation in chapter Note.

Note

This part of the documentation gives a quick overview of important advices on installation. Buggy configurations lead to non-predictable states during or after installation which can only be resolved by reinstalling.

- If you entered incorrect information, for example, adjusting the network configuration, it is recommended to quit the installation process and start again. This also refers to errors during the copying process of SAP media.
- Network configurations are checked for syntactic correctness, the logical correctness is **not** checked.
- Network masks are entered in „long“ format, for example, 255.255.255.0. The declaration of the IP address followed by the network mask (192.168.1.1/24) is not allowed.
- While copying the installation media make sure the media is correctly assigned to the requested copying process. Due to various application scenarios no checks are being carried out.

2 Installation SUSE Linux Enterprise Server for SAP Applications

2.1 Installation Profiles

After starting the installation DVD, the installation dialog with a selection of the installation profiles appears. The following profiles are available:

- INSTALL SAP AIO
- INSTALL SAP NetWeaver Enterprise Search
- INSTALL SAP generic (load external profile).

This documentation refers to the „SAP NetWeaver Enterprise Search“ installation profile.



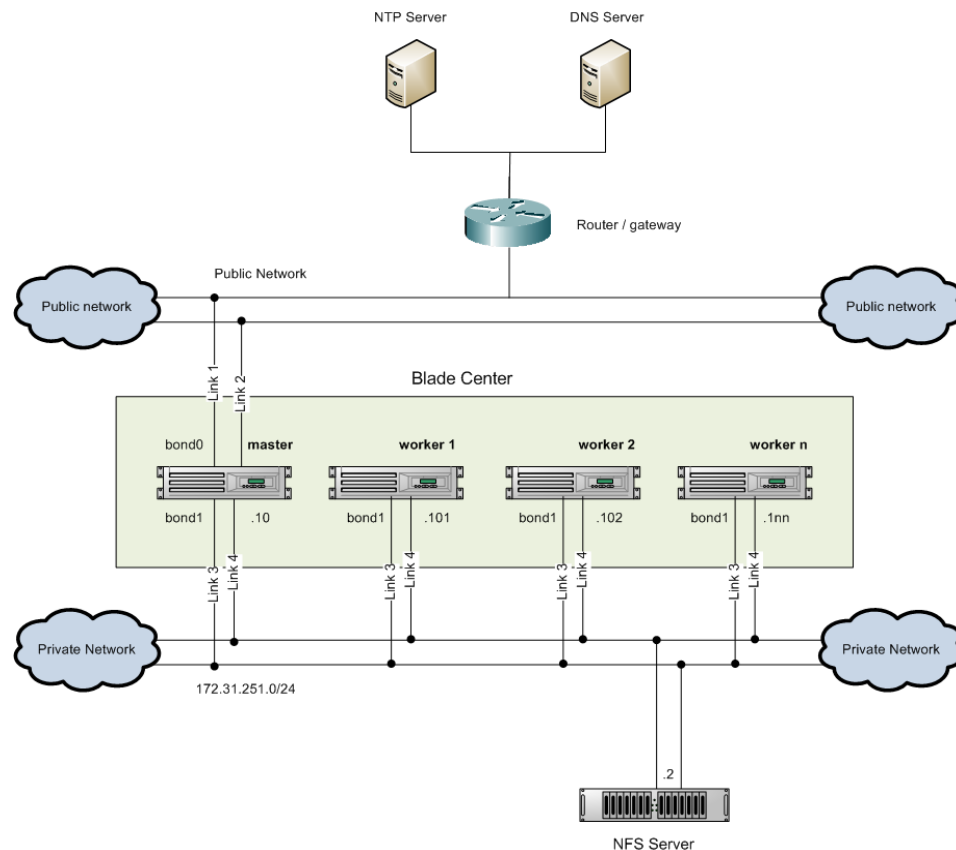
Graphic 1: Selection of Installation Profiles

2.2 Installation Profile „INSTALL SAP NetWeaver Enterprise Search“

The installation profile „INSTALL SAP NetWeaver Enterprise Search“ provides the product „SUSE Linux Enterprise Server for SAP Netweaver Enterprise Search“.

The selection allows the installation of multi-node SUSE Linux Enterprise Servers. This product is intended and optimized for the operation as „SAP NetWeaver Enterprise Search“.

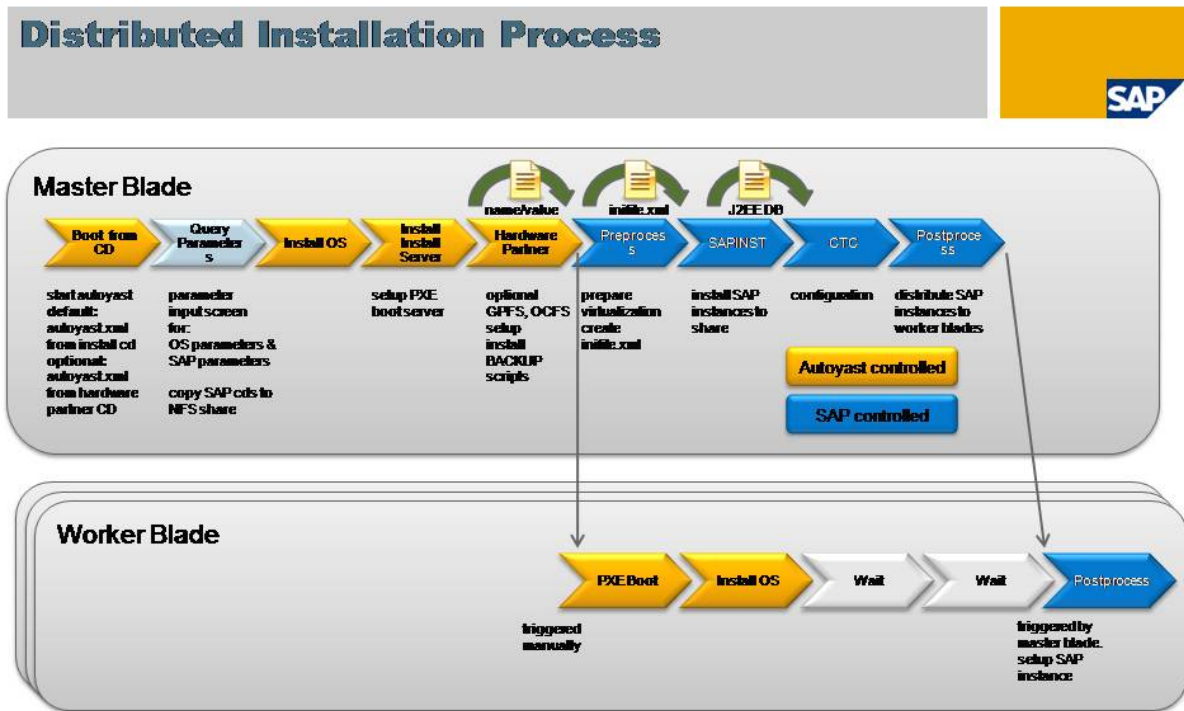
Graphic 2 shows one possible use case of the product. If the „INSTALL SAP NetWeaver Enterprise Search“ profile is chosen, the installation of the **masters** is possible. For the installation of the **worker** the **master** provides the installation media on the network.



Graphic 2: Possible Hardware Structure (Source: Novell)

At the same time the **master** provides a DHCP server on the private network which supplies the private network infrastructure.

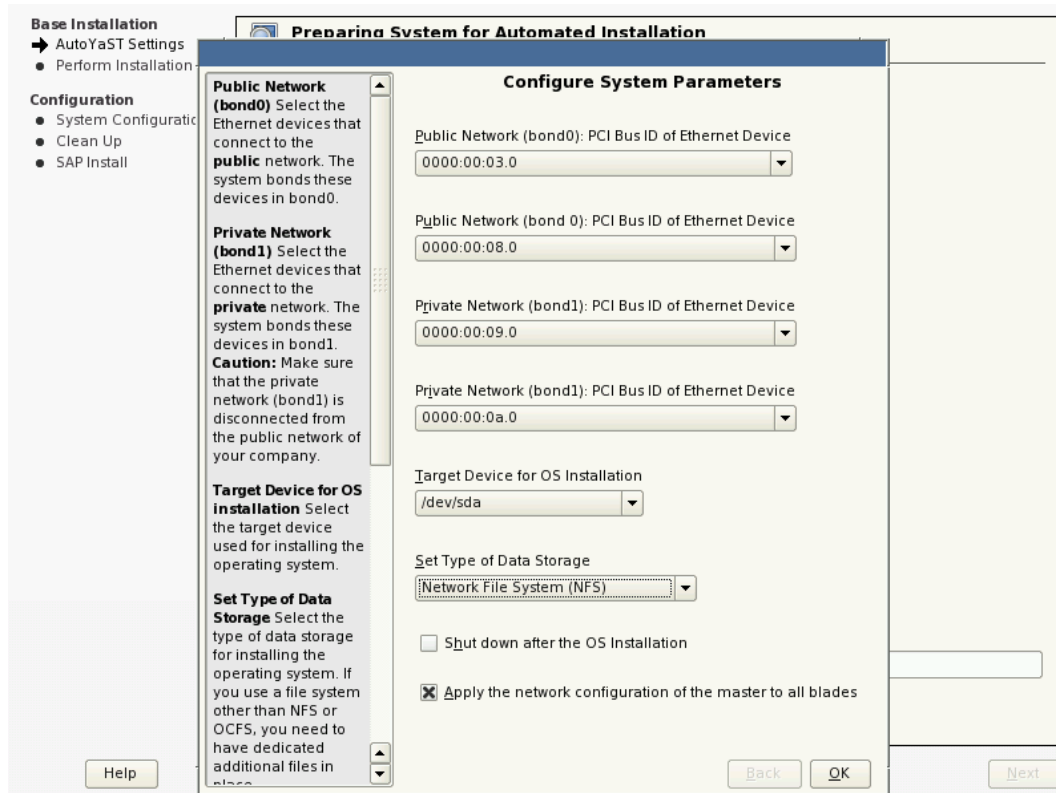
Graphic 3: the flow-chart illustrates the installation process.



Graphic 3: SAP-Enterprise-Search Flow-Chart

Note: Please note that there is only one DHCP server allowed in the network!

Graphic 4 shows the installation dialog after the start of the installation profile.



Graphic 4: Network, HD and Data Storage Configuration

In this dialog, the network card, the target hard disk and the type of the data storage to be used are configured. When configuring the network card, the bonding of the different available interfaces has to be determined. The first two network cards create the connection between the server and the public network, and the last two create the connection to the private network (see *Graphic 2*).

If several hard disks are available, in this dialog choose the hard disk that has to be used by the system. The first hard disk at the first hard disk controller is named `/dev/sda`, the second `/dev/sdb`, etc.

Note: The chosen partition is overwritten without further enquiry calls or checks and existing data will be lost!

The SAP installation proceeds to the private network.

Here, the network file system (NFS), the Oracle cluster file system (OCFS2) and the „Other File Systems“ options are available. The option „Other File Systems“ refers to 3rd-party cluster file systems which can be added via supplement media (for example, GPFS from IBM via the supplement CD from IBM).

Note: This shared storage has to exist in the private network before the installation.

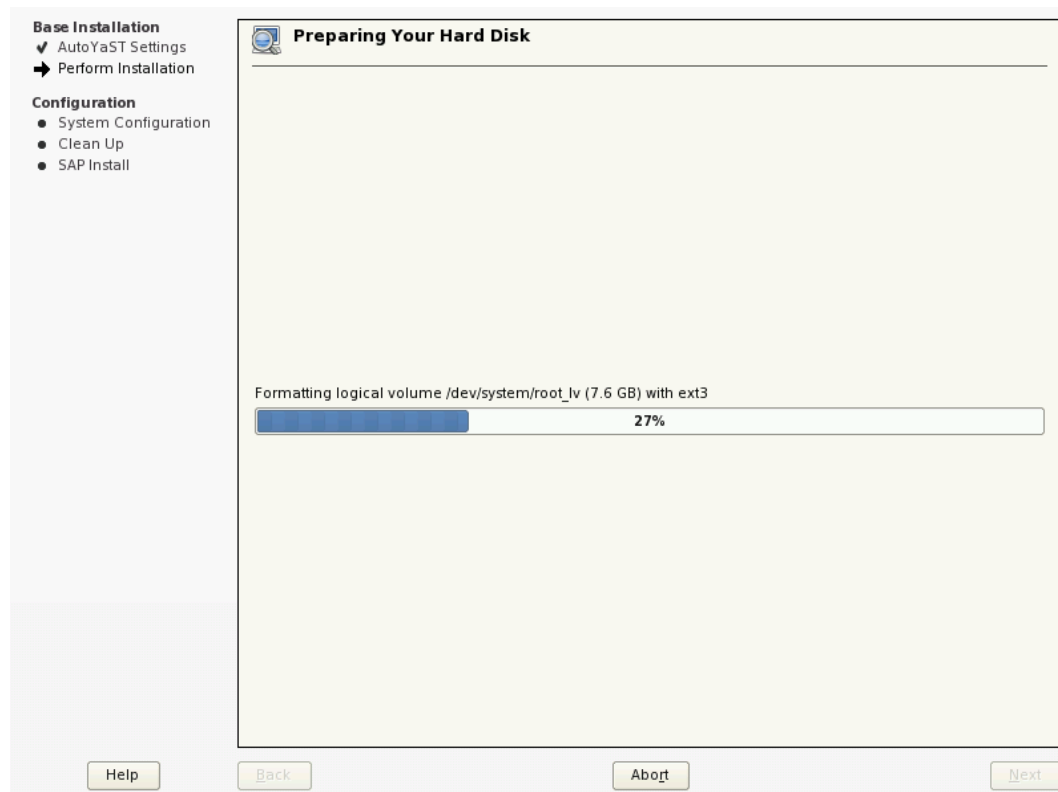
The dialog allows to shut down the system after the operating system has been installed. This can be helpful if you want to continue the installation at a later time.

In the last configuration option the worker can adopt the master's network configuration if master and worker have identical hardware configurations, for example, when using blade systems.

Note: The network cards eth2 and eth3 are connected to the private network in case they have identical hardware configurations.

After the confirmation of this dialog the partitions and the logical volume manager are set up automatically and the file systems are created.

Graphic 5 illustrates the process.



Graphic 5: Automated Setup of the Partitions and the File Systems

After finishing the automated partitioning, the required installation media have to be copied. This is a three-step-process:

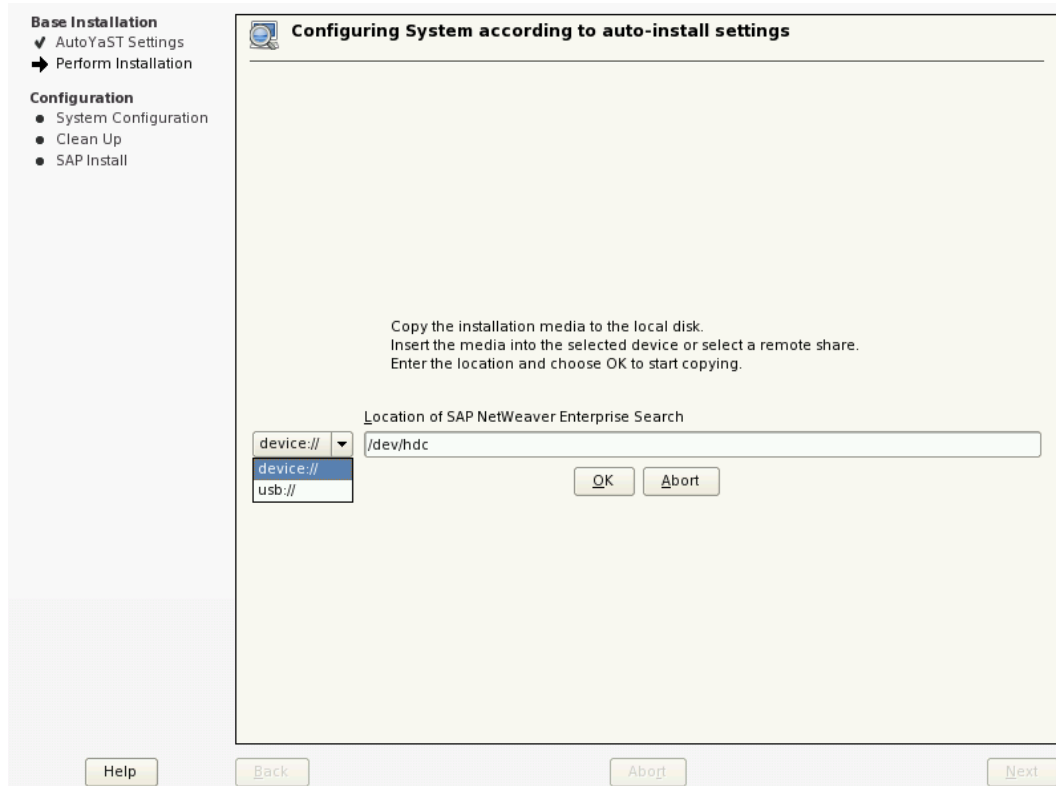
1. SAP Installation media
2. Supplementary media
3. SUSE Linux Enterprise Server media

The installation media are copied to the local hard disk to make provisioning time-efficient and to allow a fully-automated installation of SAP.

At last, the SUSE Linux Enterprise Server medium is copied to provide an installation server for the network-capable installation of the worker nodes (via AutoYaST and PXE).

WARNING: It is necessary that the mapping between the media and the related dialog is correct. Due to various application scenarios no media checks are being carried out. Incorrect mapping will lead to an erroneous installation process!

Graphic 6 shows the first of three steps of the copying process. In this dialog the location of the „SAP NetWeaver Enterprise Search“ media has to be specified.



Graphic 6: Step 1: Location of SAP NetWeaver Enterprise Search

The „SAP NetWeaver Enterprise Search“ media correspond to the following, available SAP CDs:

- SAP-CD 1 – Export (CD Label: DATA_UNITS)
- SAP-CD 2 – Java (CD Label: ES-JAVA-DVD)
- SAP-CD 3 – Database (CD Label: MAXDB)
- SAP-CD 4 – Installation Master (CD Label: ESH).

The media can either be copied from a block device or from a USB storage device. After the confirmation of this dialog the copying process of the media is carried out.

Note: Making alternative ISO images available as loop devices:

This method can be used, if the media are copied to a directory for the loop devices on the master or are provided on the network.

If the media are provided via the network, they can be added to the master, for example, via NFS.

To use this option, perform the following steps on the master:

- Switch to a text console (<Strg> + <Alt> + <F2>)
- Log in as the system administrator „root“
- Temporary configuration of a network card: the network card has to be connected to the network where the NFS server is located:

```
# ip addr add <IP-Adresse>/<Netz-Maske> dev eth<num>
# ip link set up dev eth<num>
```
- Create a mount point (do **not** use /mnt)

```
# mkdir /isofiles
```
- Mount the NFS share

```
# mount <IP-NFS-Server>:/isofiles-sles-sap /isofile
```
- Provide the ISO files with losetup

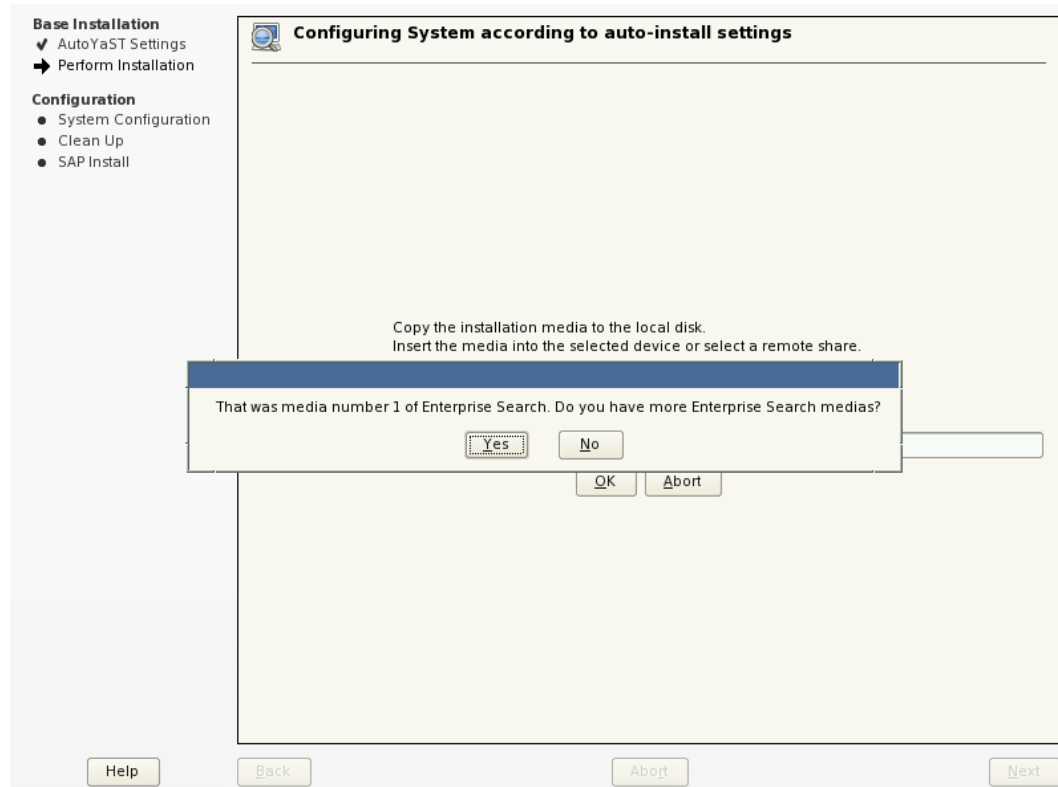
```
# losetup /dev/loop<num> sapcd1.iso
# losetup /dev/loop<num + 1> sapcd2.iso
# losetup /dev/loop<num + 2> sapcd3.iso
# losetup /dev/loop<num + 3> sapcd4.iso
...
```
- Disconnect the ISO files from the loop devices

```
# losetup -d /dev/loop<num>
# losetup -d /dev/loop<num + 1>
# losetup -d /dev/loop<num + 2>
# losetup -d /dev/loop<num + 3>
...
```
- Switch to the graphical YaST2 gui with <Alt> + <F7>
- In the YaST2 gui indicate the block devices according to the respective media with /dev/loop<num>.

Note: The temporary network configuration can also be activated at the beginning of the installation process with the boot parameter `netsetup=1`. This method of temporary network configuration is explained in the appendix in 3.1 Netsetup.

After the copying process is finished you will be asked for further „SAP NetWeaver Enterprise Search“ media. In this case, the copying process has to be repeated until all four SAP media have been copied. The copying process is necessary to be able to start the SAP installation after SUSE Linux Enterprise Server has been installed.

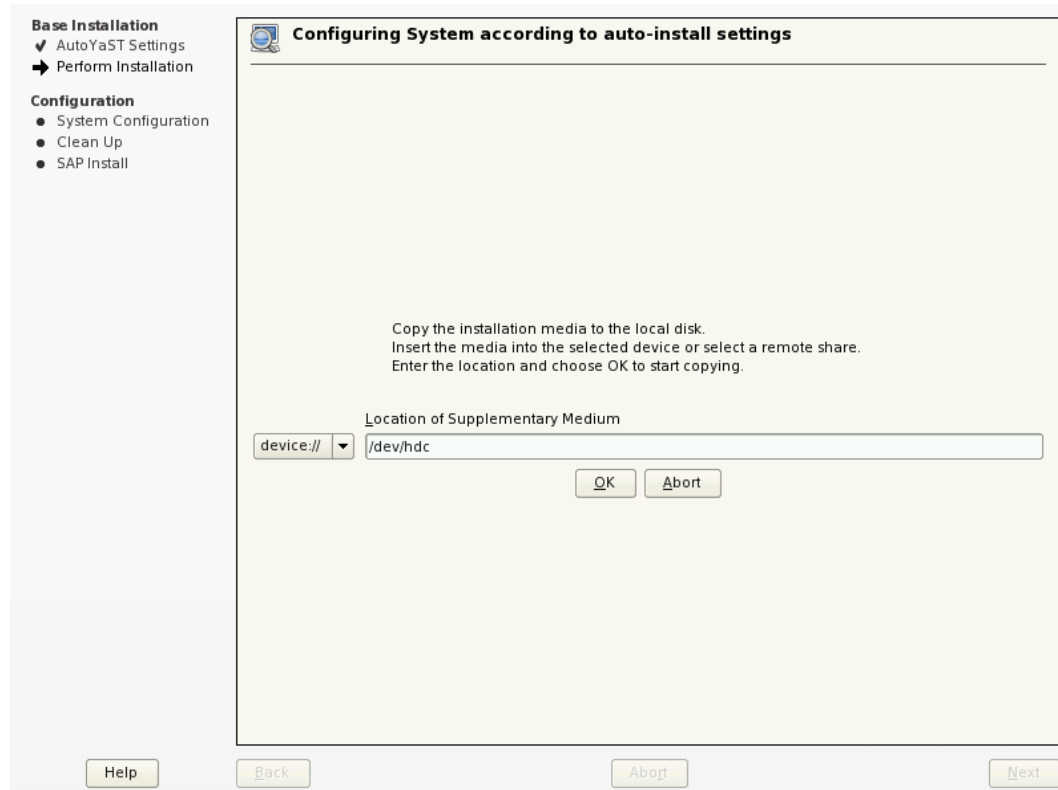
Graphic 7 shows the dialog that asks for further media.



Graphic 7: Location of the Installation Media– Step 1

As soon as all SAP media have been copied, abort this dialog with „No“ to switch to the next step of the copying process.

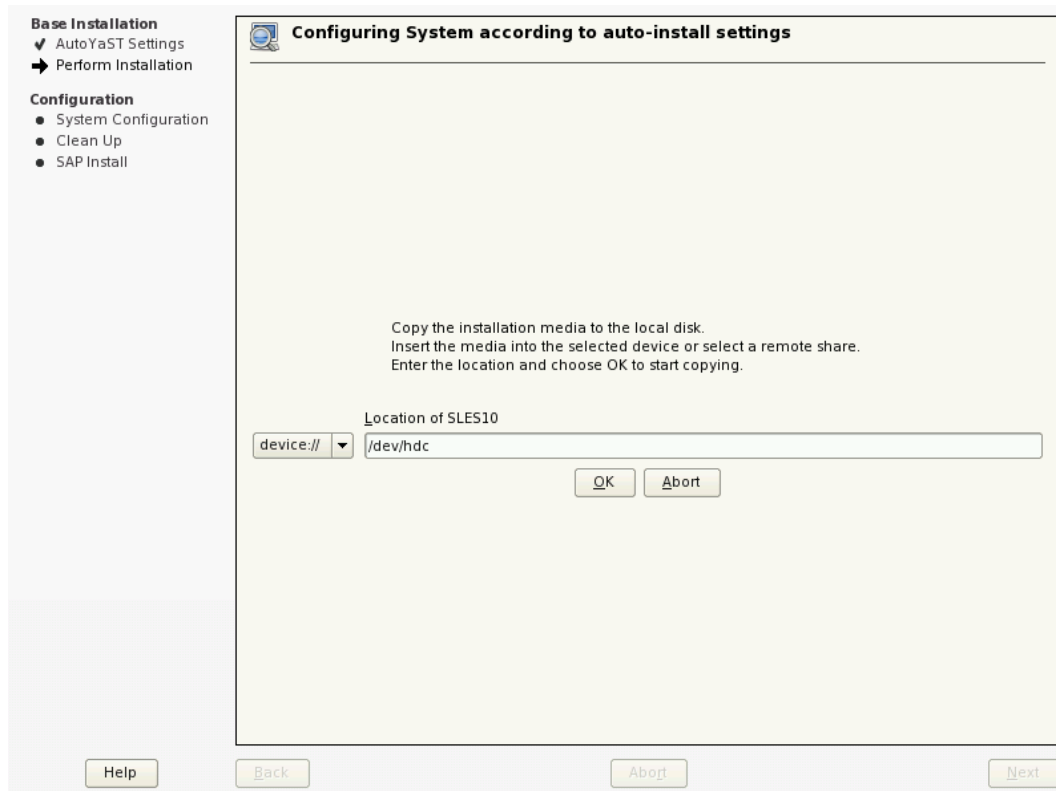
After that, the copying process of the supplementary media is carried out (see *Graphic 8*). These media can be specified optionally. If no other media are available, finish with „Abort“ to go to the next step of the copying process.



Graphic 8: Location of Supplementary Media – Step 2

If supplementary media have to be copied, you are asked if there are other media available after finishing the copying process. If there are no other media available, quit the dialog with „No“.

Now, the location of the „SLES10“ medium is required (see *graphic 9*).



Graphic 9: Location of SLES10 Media – Step 2

After the last copying process is completed, a confirmation dialog appears (see *graphic 10*). Confirm the dialog.

WARNING: The media are not checked. Only a copying process is carried out.

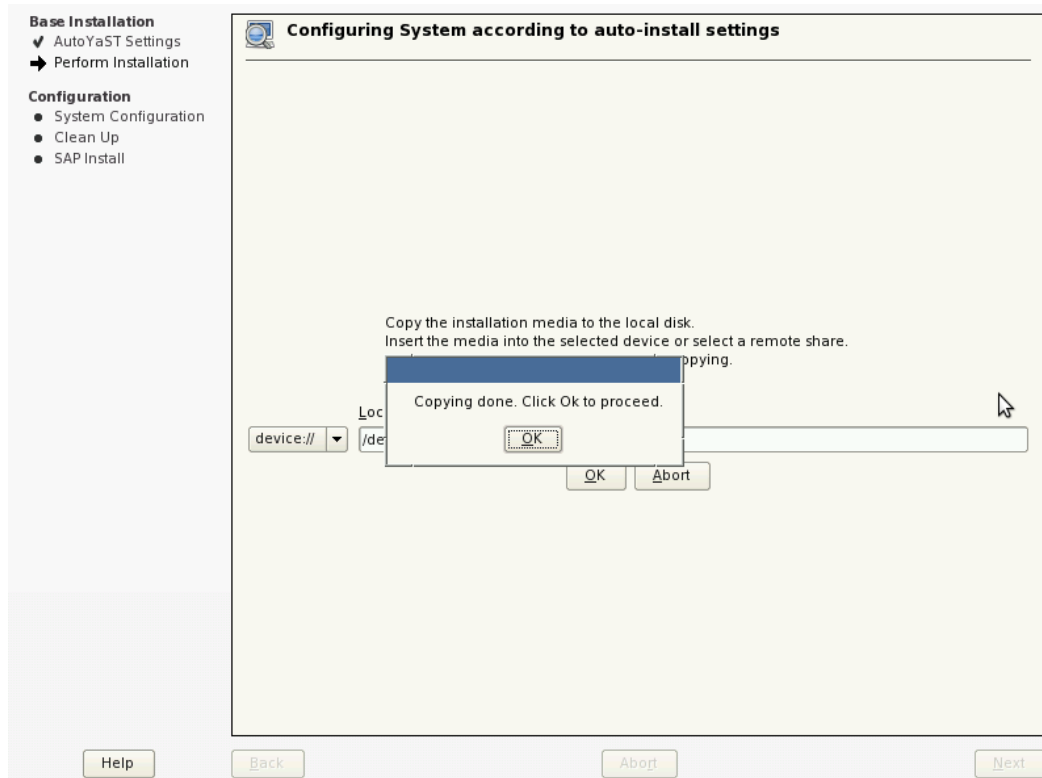
The installation dialog informs you which media has to be connected. If any errors occur during this process, the SAP installation and the later worker installation cannot be accomplished correctly.

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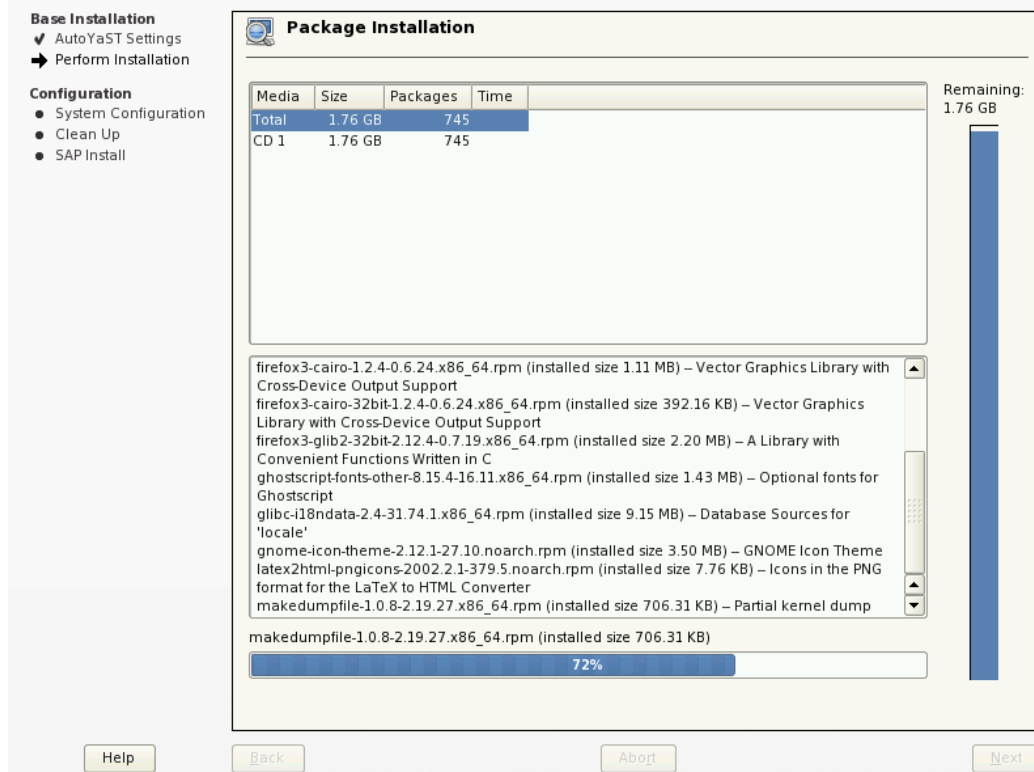
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Graphic 10: Confirmation Dialog of the Copying Process of the SLES10 Media

Subsequently, the installation of the SUSE Linux Enterprise Server packages is automatically activated by the installer (see *graphic 11*).



Graphic 11: Installation of the SUSE Linux Enterprise Server Packages

The further installation is carried out automatically, the SUSE Linux Enterprise Server packages are configured, and the boot loader is installed. Depending on the configurations in the first installation dialog (see *graphic 4*), the system is rebooted. After the reboot of the system YaST2 is started for the concluding configuration of the system.

The network configuration follows (see *graphic 2*). *Graphic 12* illustrates the first dialog of this step: the configuration of the IP address for the public and the private network. In the „Private Network Address“ text field enter the network address (**not** the IP address) without the subnet mask, e. g. 172.31.251.0.

In the „Target for SAP Installation“ text field, enter the target of the shared storage on which the SAP system is going to be installed. This shared storage has to exist before the installation.

WARNING: The IP addresses are checked logically. Incorrect IP addresses lead to errors in the SAP or fully-automated worker installation process.

It is necessary to enter correct information in the network-related text fields. Otherwise, installation errors may occur. Enter the network mask in quad-dotted decimal format (for example, 255.255.255.0).

Graphic 12: IP Network Configuration

Furthermore, the DNS server, the NTP server and, if necessary, the proxy are configured. If you select the proxy server option, the IP address of the proxy server is needed. The „No Proxy“ text field allows a comma-separated listing of targets which the proxy server is not used for. In the last two text fields enter the login data for the proxy server. *Graphic 13* illustrates the input mask of the configuration.

WARNING: The configuration information has to be logically correct. The logical correctness in **not** checked!

Additional Network Settings

IP Address of DNS Server
Enter the IP of the name server (DNS) in your company network.

IP Address of DNS Server
149.205.40.1

Domain Name Search List
Enter a space separated list of DNS domains.

Domain Name Search List

NTP Server
Enter the IP address or the DNS name of the time server (NTP) in your company network.

NTP Server

Use Proxy

Proxy Server

Proxy Server
http://proxy.domain:3128

No Proxy

No Proxy
master, localhost, 127.0.0.1

Proxy User

Proxy User
puser1

Proxy Password

Proxy Password
puser1234

Back OK

Graphic 13: Further Network Configurations

Finish the network configuration by entering the administrator's contact information (e-mail address and the corresponding mail server).

Adminstrator E-Mail Settings

Administrator E-Mail Address
Enter the e-mail address of the administrator who is to receive the system messages. For more

Administrator E-Mail Address
admin

Mail Relay Server

Mail Relay Server
smtp.fa.de

Back OK

Graphic 14: Administrator's E-Mail Configuration

Graphic 15 illustrates the configuration of the SAP NetWeaver Enterprise Search installation. In this dialog enter the preferred Blade server including the master server. Furthermore, determine the preferred SAP ABAP dialog instances. Make sure the number of blades and SAP ABAP dialog instances is correct, as they depend on each other.

NOTE: The information you enter is not checked!

Finish the dialog by entering the SAP master password. The password has to conform the requirements on the left of the dialog. The password is used for the operating system as well as for the SAP system.

Configure SAP NetWeaver Enterprise Search Installation

Total Number of Blades: Enter the number of blades on which you want to install the SAP system (including the master blade).

Number of ABAP Dialog Instances: Enter the number of dual-stack dialog instances (only AS ABAP is active) for scaling out the blade system.

SAP System ID (SID): Enter an SID that identifies the SAP system, including all instances on all blades.

Caution: Choose your SID carefully. Renaming requires you

Total Number of Blades: 1

Number of ABAP Dialog Instances: 1

SAP System ID (SID): ESA

SAP Master Password: *****

Back OK

Graphic 15: Configuration of the SAP NetWeaver Enterprise Search Installation

Graphic 16 illustrates the configuration dialog of the virtual SAP network. The configurations are SAP-specific and should not be changed.

NOTE: The network configuration is not checked.

For further adjustments use the „Advanced Installation Options“ text field.

Parameter:

- Deactivate the DHCP server in the private network:

```
dhcpcserver=false
```

This parameter deactivates the master's automatic supply of a DHCP server for the private network.

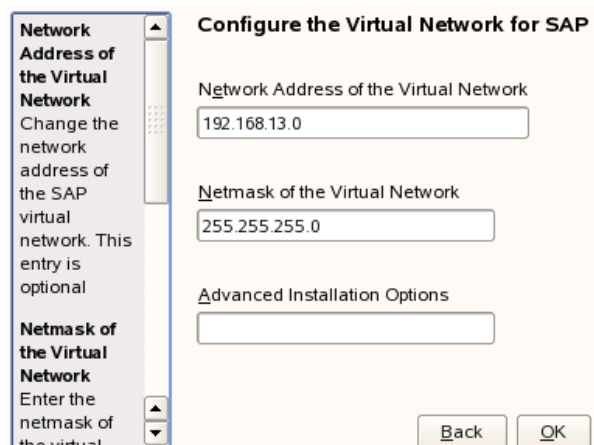
- Deactivate the automatic SAP installation:

```
sapinstall=false
```

This parameter deactivates the SAP installation which starts automatically after the SUSE Linux Enterprise Server installation. In this case, the SAP installation can be carried out subsequently.

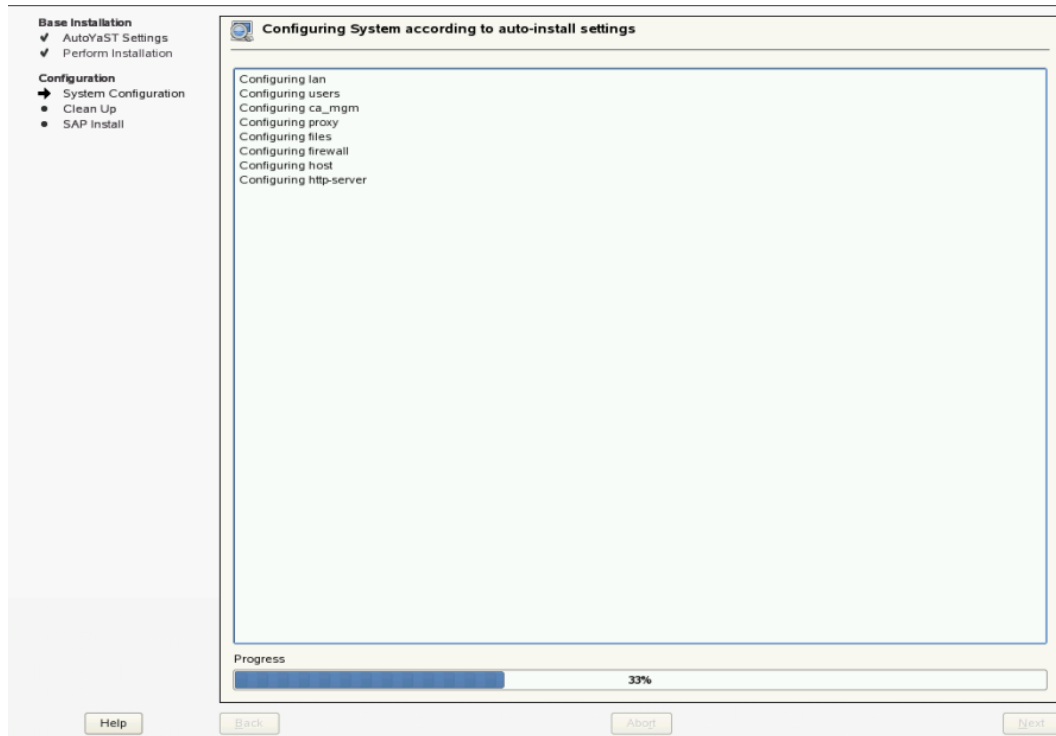
WARNING: Here, the default configuration of the DHCP server can be modified to avoid problems with an already existing DHCP server (see 2.2 Installation Profile „INSTALL SAP NetWeaver Enterprise Search“).

The deactivation of the master's automatic supply of a DHCP servers affects the automatic worker installation, as the DHCP server provides the PXE boot information for the worker in the private network. When deactivating the automatic supply of a DHCP server, that information has to be distributed by an already existing DHCP server.



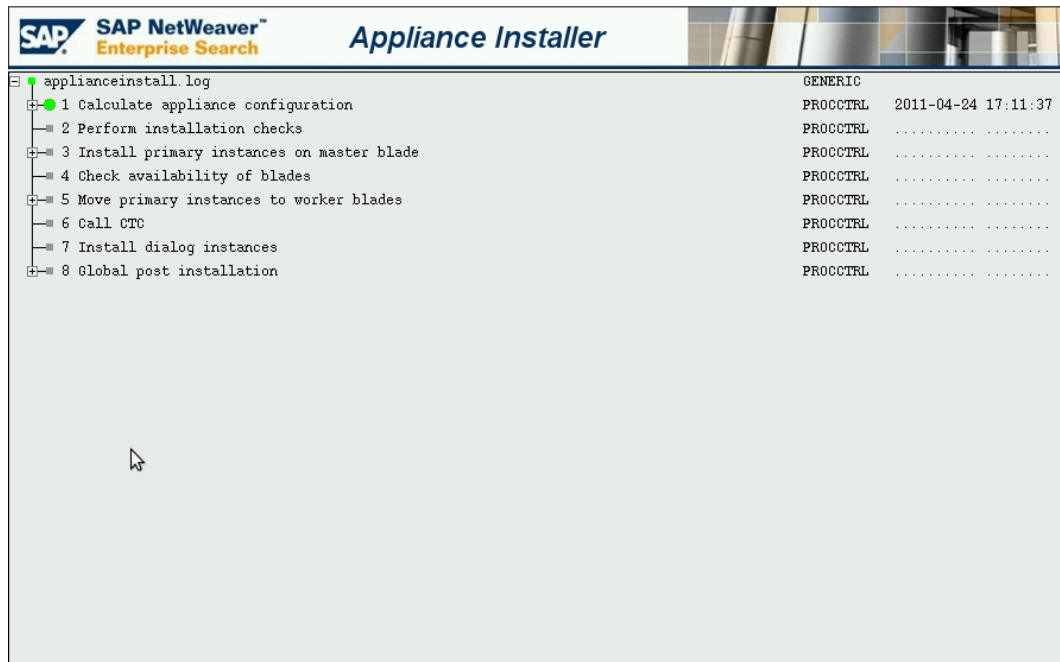
Graphic 16: Configuring SAP-VPN

After the confirmation of the dialog the system is automatically configured (see *graphic 17*).



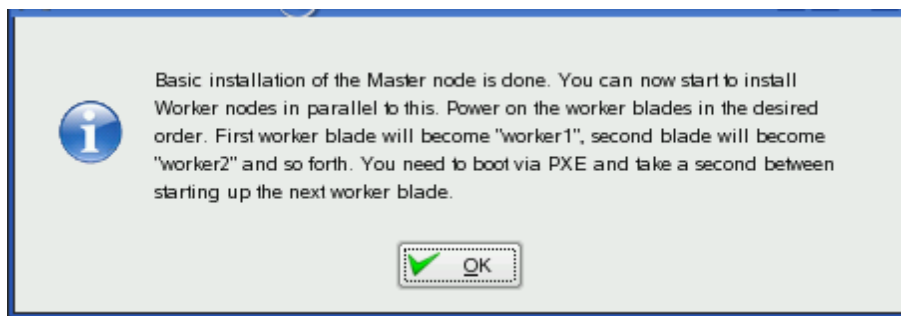
Graphic 17: Finishing SUSE Linux Enterprise Server Configuration/Installation

After the configuration is finished the X11 interface and the pending SAP installation come up. *Graphic 18* illustrates the continuation of the SAP installation.



Graphic 18: Starting the SAP Installation

From that moment the installation of the worker can be started (see *graphic 3*), as the PXE boot system is already operational after finishing SUSE Linux Enterprise Server installation and configuration. The dialog in *graphic 19* indicates that the basic installation of the master is done.



Graphic 19: Worker Can Now be Installed

2.3 Worker Installation

Start any worker installation by booting the worker computer. Make sure the PXE network boot parameter is correctly set up in the BIOS/Firmware on the worker system, as the installation of the worker runs on the network. If the worker system is already set up for the PXE network process, the installation starts automatically.

NOTE: The worker installations can be started simultaneously.

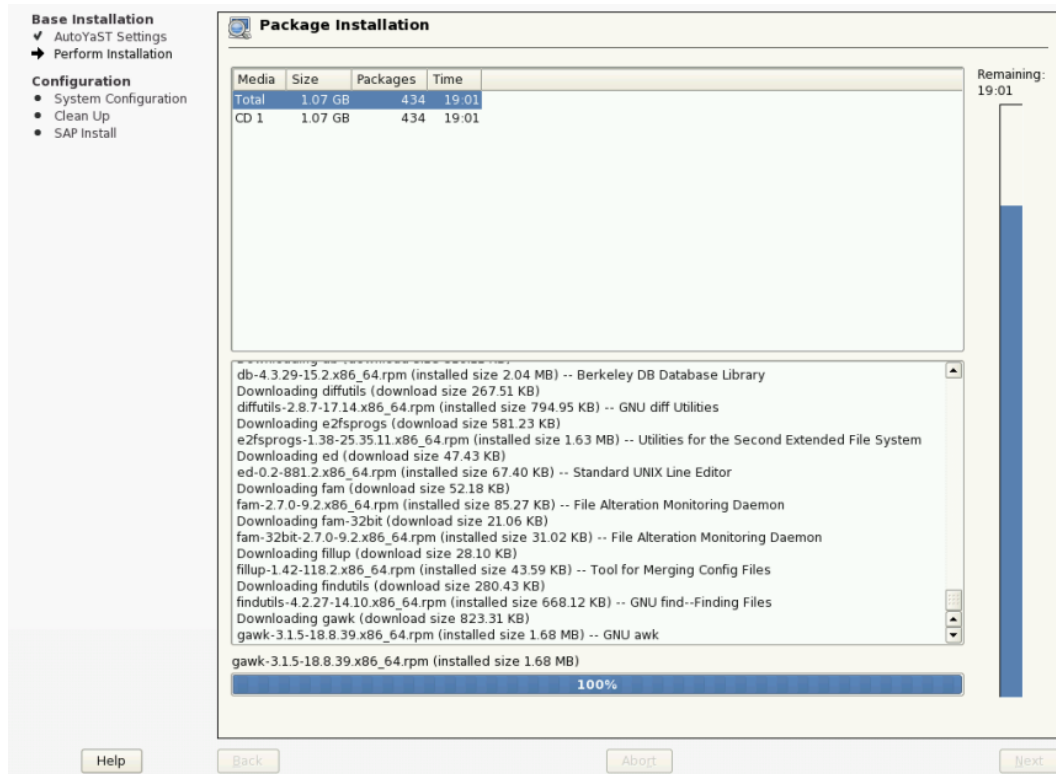
A boot request follows (see *graphic 20*). Confirm with <Enter> or enter `worker<number>` to assign the respective host name „worker<number>“ to the worker. If you press enter without any specific entry, the default profile is used without a host name and, after the timeout of the boot menu, the installation is started automatically.

```
worker9          - Install 'worker9' ES Worker on this blade
worker10         - Install 'worker10' ES Worker on this blade
worker11         - Install 'worker11' ES Worker on this blade
worker12         - Install 'worker12' ES Worker on this blade
worker13         - Install 'worker13' ES Worker on this blade
worker14         - Install 'worker14' ES Worker on this blade
worker15         - Install 'worker15' ES Worker on this blade
worker16         - Install 'worker16' ES Worker on this blade
worker17         - Install 'worker17' ES Worker on this blade
worker18         - Install 'worker18' ES Worker on this blade
worker19         - Install 'worker19' ES Worker on this blade
worker20         - Install 'worker20' ES Worker on this blade
worker21         - Install 'worker21' ES Worker on this blade
worker22         - Install 'worker22' ES Worker on this blade
worker23         - Install 'worker23' ES Worker on this blade
worker24         - Install 'worker24' ES Worker on this blade
worker25         - Install 'worker25' ES Worker on this blade
worker26         - Install 'worker26' ES Worker on this blade
worker27         - Install 'worker27' ES Worker on this blade
worker28         - Install 'worker28' ES Worker on this blade
worker29         - Install 'worker29' ES Worker on this blade
worker30         - Install 'worker30' ES Worker on this blade
worker31         - Install 'worker31' ES Worker on this blade
worker32         - Install 'worker32' ES Worker on this blade
boot: _
```

Graphic 20: Boot Dialog – Worker Number Request

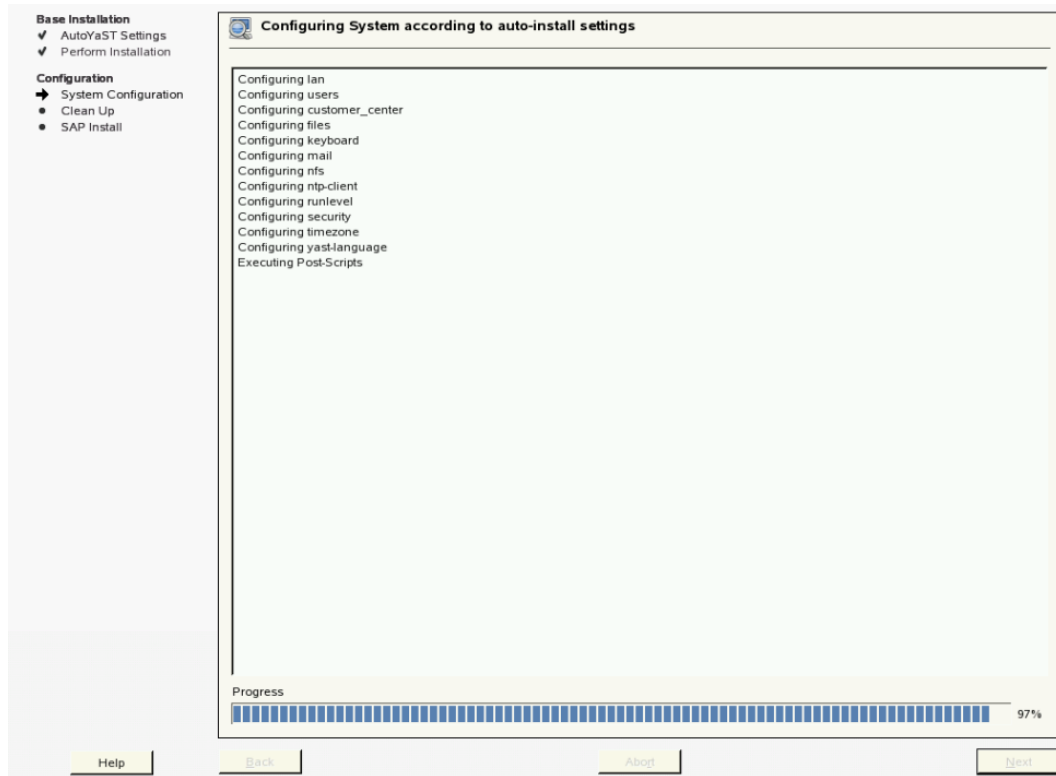
Now the worker installation proceeds automatically (see *graphic 21*).

NOTE: The worker automatically gets all the configuration data from the master.



Graphic 21: Automated Worker Installation Process

After the SUSE Linux Enterprise Server installation process has been successful the system is rebooted and an automatic configuration process follows (see *graphic 22*).



Graphic 22: Automatic Worker Configuration Process

The worker system is ready to use after the configuration process.

3 Appendix

3.1 Netsetup

With the `netsetup=1` parameter a temporary network configuration for the installation process can be activated. This configuration is only responsible for the installation process and is overwritten when the operating system is configured.

Graphic 23 illustrates the boot parameter which activates the temporary network configuration with the value 1.

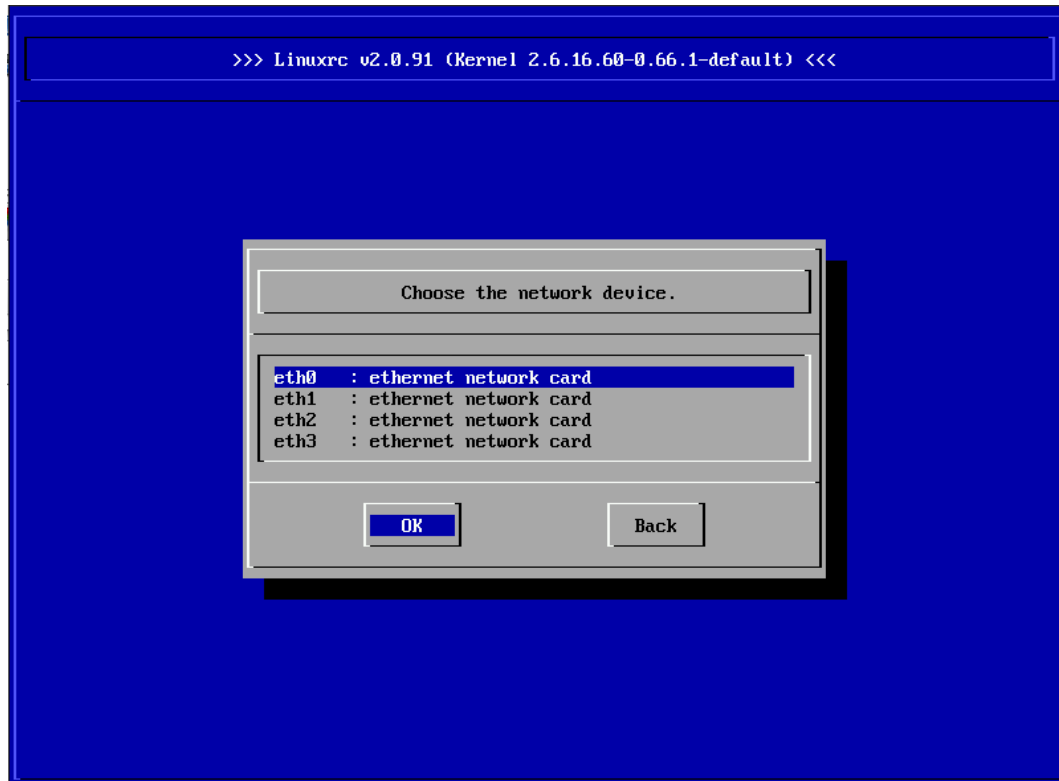


Graphic 23: Netinstall Activation

The Netinstall activation can be used to mount the shared storage to, for example, make the SAP Installation media available over the network (see page SAP Installation media).

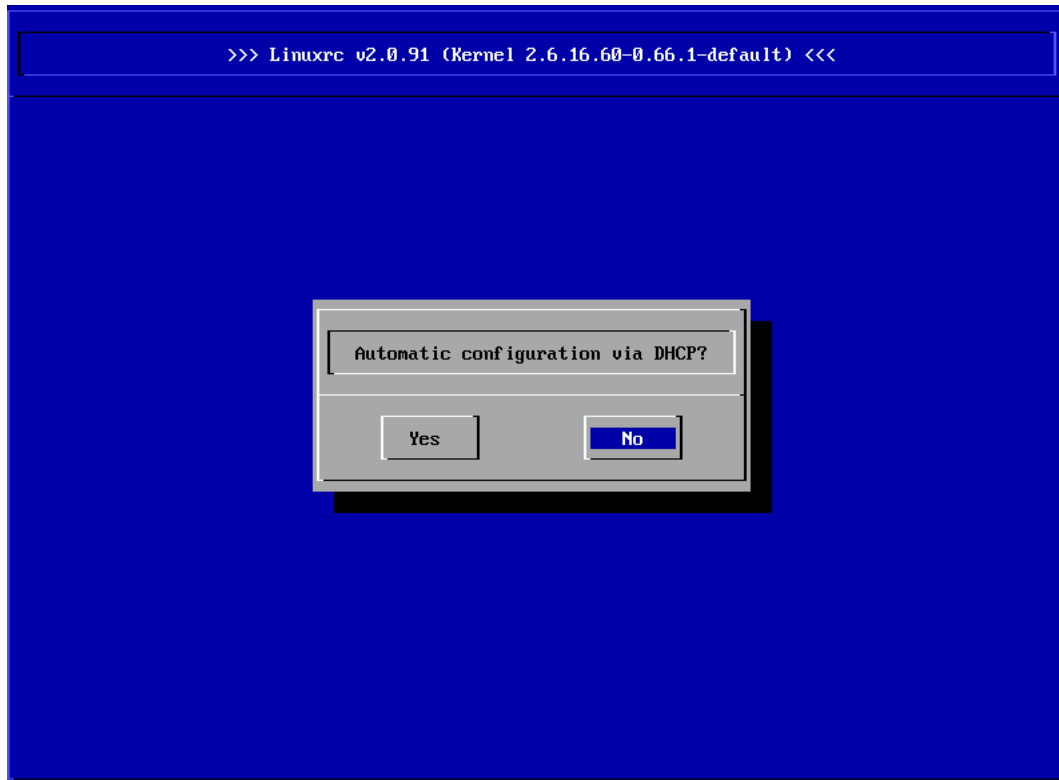
After the Kernel is loaded a YaST dialog for the temporary network configuration follows. In this dialog (see *graphic 24*) choose the network card which is connected to the „service“ network during the installation process.

NOTE: If a DHCP service is provided by the temporary “service” network, this network has to be deactivated after the copying process of the SAP media. That is done by deactivating the network card on a console or by removing the network cable. As the master itself provides a DHCP service for the private network after the operating system has been installed, no other DHCP server may be available there.



Graphic 24: Selection of the Network Card for Temporary Network Configuration

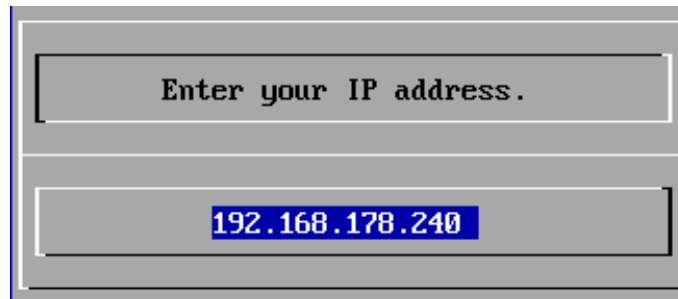
The selection of the network configuration (static/DHCP) follows (see graphic 25). If DHCP is chosen the network card is configured automatically and is available for the standard installation process which starts automatically.



Graphic 25: Selection of the Network Card for the Temporary Network Configuration

In the selection of the static network configuration enter your IP address, the network mask, the IP address of the gateway and the IP address of the DNS servers in the following dialogs (see *graphics 26, 27, 28, 29*).

NOTE: The entry of the network configuration is not logically checked!



Graphic 26: Entry of the IP Address for Static, Temporary Network Configuration

Enter your netmask. For a normal class C network, this is usually 255.255.255.0.

255.255.255.0_

Graphic 27: Entry of the Network Mask for Static, Temporary Network Configuration

If you need a gateway to reach the server, enter the IP address of the gateway.
If you do not need a gateway, enter your own IP address.

192.168.178.1

Graphic 28: Entry of the IP Address of the Gateway for Static, Temporary Network Configuration

Enter the IP address of your name server. If you do not use a name server, press
ESC.

192.168.178.1

Graphic 29: Entry of the IP Address of the DNS Servers for Static, Temporary Network Configuration

4 Sources

Download of the ISO image for SUSE Linux Enterprise Server for SAP applications (Novell registration necessary):

<http://download.novell.com/protected/Summary.jsp?buildid=HkisvrMhDLs>

Information page on SUSE Linux Enterprise Server for SAP Applications:

<http://www.novell.com/de-de/products/sles-for-sap.html>

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