

## 5 Deployment Strategies

There are several different ways to deploy SUSE Linux Enterprise Server. Choose from various approaches ranging from a local installation using physical media or a network installation server to a mass deployment using a remote-controlled, highly-customized, and automated installation technique. Select the method that best matches your requirements.

### 5.1 Deploying up to 10 Workstations

If your deployment of SUSE Linux Enterprise Server only involves 1 to 10 workstations, the easiest and least complex way of deploying SUSE Linux Enterprise Server is a plain manual installation as featured in *Chapter 6, Installation with YaST*. Manual installation can be done in several different ways, depending on your requirements:

#### *Installing from the SUSE Linux Enterprise Server Media*

Consider this approach if you want to install a single, disconnected workstation.

#### *Installing from a Network Server Using SLP*

Consider this approach if you have a single workstation or a few workstations and if a network installation server announced via SLP is available.

#### *Installing from a Network Server*

Consider this approach if you have a single workstation or a few workstations and if a network installation server is available.

**TABLE 5.1: INSTALLING FROM THE SUSE LINUX ENTERPRISE SERVER MEDIA**

Installation Source	SUSE Linux Enterprise Server Media Kit
Tasks Requiring Manual Interaction	<ul style="list-style-type: none"><li>• Inserting the installation media</li><li>• Booting the installation target</li><li>• Changing media</li><li>• Determining the YaST installation scope</li><li>• Configuring the system with YaST</li></ul>

Remotely Controlled Tasks	None
Details	<i>Installing from the SUSE Linux Enterprise Server Media (DVD, USB)</i>

**TABLE 5.2: INSTALLING FROM A NETWORK SERVER USING SLP**

Installation Source	Network installation server holding the SUSE Linux Enterprise Server installation media
Tasks Requiring Manual Interaction	<ul style="list-style-type: none"> <li>• Inserting the boot disk</li> <li>• Booting installation target</li> <li>• Determining the YaST installation scope</li> <li>• Configuring the system with YaST</li> </ul>
Remotely Controlled Tasks	None, but this method can be combined with VNC
Details	<i>Installing from a Network Server</i>

**TABLE 5.3: INSTALLING FROM A NETWORK SERVER**

Installation Source	Network installation server holding the SUSE Linux Enterprise Server installation media
Tasks Requiring Manual Interaction	<ul style="list-style-type: none"> <li>• Inserting the boot disk</li> <li>• Providing boot options</li> <li>• Booting the installation target</li> <li>• Determining the YaST installation scope</li> <li>• Configuring the system with YaST</li> </ul>
Remotely Controlled Tasks	None, but method can be combined with VNC
Details	<i>Installing from a Network Server</i>

## 5.2 Deploying up to 100 Workstations

With a growing number of workstations to install, you certainly do not want to install and configure each one of them manually. There are many automated or semi-automated approaches and several options for performing an installation with minimal to no physical user interaction. Before considering a fully-automated approach, take into account that the more complex the scenario gets the longer it takes to set up. If a time limit is associated with your deployment, it might be a good idea to select a less complex approach that can be carried out much more quickly. Automation makes sense for huge deployments and those that need to be carried out remotely.

Choose from the following options:

### *Simple Remote Installation via VNC—Static Network Configuration*

Consider this approach in a small to medium scenario with a static network setup. A network, network installation server, and VNC viewer application are required.

### *Simple Remote Installation via VNC—Dynamic Network Configuration*

Consider this approach in a small to medium scenario with dynamic network setup through DHCP. A network, network installation server, and VNC viewer application are required.

### *Remote Installation via VNC—PXE Boot and Wake on LAN*

Consider this approach in a small to medium scenario that needs to be installed via the network and without physical interaction with the installation targets. A network, a network installation server, network boot images, network bootable target hardware, and a VNC viewer application are required.

### *Simple Remote Installation via SSH—Static Network Configuration*

Consider this approach in a small to medium scenario with static network setup. A network, network installation server, and SSH client application are required.

### *Remote Installation via SSH—Dynamic Network Configuration*

Consider this approach in a small to medium scenario with dynamic network setup through DHCP. A network, network installation server, and SSH client application are required.

### *Remote Installation via SSH—PXE Boot and Wake on LAN*

Consider this approach in a small to medium scenario that needs to be installed via the network and without physical interaction with the installation targets. A network, a network installation server, network boot images, network bootable target hardware, and an SSH client application are required.

### Simple Mass Installation

Consider this approach for large deployments to identical machines. If configured to use network booting, physical interaction with the target systems is not needed. A network, a network installation server, a remote controlling application (such as a VNC viewer or an SSH client), and an AutoYaST configuration profile are required. If using network boot, a network boot image and network bootable hardware are required, as well.

### Rule-Based Autoinstallation

Consider this approach for large deployments to various types of hardware. If configured to use network booting, physical interaction with the target systems is not needed. A network, installation server, a remote controlling application (such as a VNC viewer or an SSH client), and several AutoYaST configuration profiles as well (as a rule setup for AutoYaST) are required. If using network boot, a network boot image and network bootable hardware are required, as well.

**TABLE 5.4: SIMPLE REMOTE INSTALLATION VIA VNC—STATIC NETWORK CONFIGURATION**

Installation Source	Network
Preparations	<ul style="list-style-type: none"><li>• Setting up an installation source</li><li>• Booting from the installation media</li></ul>
Control and Monitoring	Remote: VNC
Best Suited For	Small to medium scenarios with varying hardware
Drawbacks	<ul style="list-style-type: none"><li>• Each machine must be set up individually</li><li>• Physical access is needed for booting</li></ul>
Details	<i>Section 13.1.1, “Simple Remote Installation via VNC—Static Network Configuration”</i>

**TABLE 5.5: SIMPLE REMOTE INSTALLATION VIA VNC—DYNAMIC NETWORK CONFIGURATION**

Installation Source	Network
Preparations	<ul style="list-style-type: none"><li>• Setting up the installation source</li><li>• Booting from the installation media</li></ul>

Control and Monitoring	Remote: VNC
Best Suited For	Small to medium scenarios with varying hardware
Drawbacks	<ul style="list-style-type: none"> <li>• Each machine must be set up individually</li> <li>• Physical access is needed for booting</li> </ul>
Details	<i>Section 13.1.2, "Simple Remote Installation via VNC—Dynamic Network Configuration"</i>

**TABLE 5.6: REMOTE INSTALLATION VIA VNC—PXE BOOT AND WAKE ON LAN**

Installation Source	Network
Preparations	<ul style="list-style-type: none"> <li>• Setting up the installation source</li> <li>• Configuring DHCP, TFTP, PXE boot, and WOL</li> <li>• Booting from the network</li> </ul>
Control and Monitoring	Remote: VNC
Best Suited For	<ul style="list-style-type: none"> <li>• Small to medium scenarios with varying hardware</li> <li>• Completely remote installations; cross-site deployment</li> </ul>
Drawbacks	Each machine must be set up manually
Details	<i>Section 13.1.3, "Remote Installation via VNC—PXE Boot and Wake on LAN"</i>

**TABLE 5.7: SIMPLE REMOTE INSTALLATION VIA SSH—STATIC NETWORK CONFIGURATION**

Installation Source	Network
Preparations	<ul style="list-style-type: none"> <li>• Setting up the installation source</li> <li>• Booting from the installation media</li> </ul>

Control and Monitoring	Remote: SSH
Best Suited For	<ul style="list-style-type: none"> <li>• Small to medium scenarios with varying hardware</li> <li>• Low bandwidth connections to target</li> </ul>
Drawbacks	<ul style="list-style-type: none"> <li>• Each machine must be set up individually</li> <li>• Physical access is needed for booting</li> </ul>
Details	<i>Section 13.1.4, "Simple Remote Installation via SSH—Static Network Configuration"</i>

**TABLE 5.8: REMOTE INSTALLATION VIA SSH—DYNAMIC NETWORK CONFIGURATION**

Installation Source	Network
Preparations	<ul style="list-style-type: none"> <li>• Setting up the installation source</li> <li>• Booting from installation media</li> </ul>
Control and Monitoring	Remote: SSH
Best Suited For	<ul style="list-style-type: none"> <li>• Small to medium scenarios with varying hardware</li> <li>• Low bandwidth connections to target</li> </ul>
Drawbacks	<ul style="list-style-type: none"> <li>• Each machine must be set up individually</li> <li>• Physical access is needed for booting</li> </ul>
Details	<i>Section 13.1.5, "Simple Remote Installation via SSH—Dynamic Network Configuration"</i>

**TABLE 5.9: REMOTE INSTALLATION VIA SSH—PXE BOOT AND WAKE ON LAN**

Installation Source	Network
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Preparations	<ul style="list-style-type: none"> <li>• Setting up the installation source</li> <li>• Configuring DHCP, TFTP, PXE boot, and WOL</li> <li>• Booting from the network</li> </ul>
Control and Monitoring	Remote: SSH
Best Suited For	<ul style="list-style-type: none"> <li>• Small to medium scenarios with varying hardware</li> <li>• Completely remote installs; cross-site deployment</li> <li>• Low bandwidth connections to target</li> </ul>
Drawbacks	Each machine must be set up individually
Details	<i>Section 13.1.6, "Remote Installation via SSH—PXE Boot and Wake on LAN"</i>

**TABLE 5.10: SIMPLE MASS INSTALLATION**

Installation Source	Preferably network
Preparations	<ul style="list-style-type: none"> <li>• Gathering hardware information</li> <li>• Creating AutoYaST profile</li> <li>• Setting up the installation server</li> <li>• Distributing the profile</li> <li>• Setting up network boot (DHCP, TFTP, PXE, WOL)</li> </ul> <p><i>or</i></p> <p>Booting the target from installation media</p>
Control and Monitoring	Local or remote through VNC or SSH

Best Suited For	<ul style="list-style-type: none"> <li>• Large scenarios</li> <li>• Identical hardware</li> <li>• No access to system (network boot)</li> </ul>
Drawbacks	Applies only to machines with identical hardware
Details	<i>Section 25.1, "Simple Mass Installation"</i>

**TABLE 5.11: RULE-BASED AUTOINSTALLATION**

Installation Source	Preferably network
Preparations	<ul style="list-style-type: none"> <li>• Gathering hardware information</li> <li>• Creating AutoYaST profiles</li> <li>• Creating AutoYaST rules</li> <li>• Setting up the installation server</li> <li>• Distributing the profile</li> <li>• Setting up network boot (DHCP, TFTP, PXE, WOL)</li> </ul> <p><i>or</i></p> <p>Booting the target from installation media</p>
Control and Monitoring	Local or remote through SSH or VNC
Best Suited For	<ul style="list-style-type: none"> <li>• Varying hardware</li> <li>• Cross-site deployments</li> </ul>
Drawbacks	Complex rule setup
Details	<i>Section 25.2, "Rule-Based Autoinstallation"</i>



## 5.3 Deploying More than 100 Workstations

Most of the considerations brought up for medium installation scenarios in *Section 5.1, “Deploying up to 10 Workstations”* still hold true for large scale deployments. However, with a growing number of installation targets, the benefits of a fully automated installation method outweigh its drawbacks.

It pays off to invest a considerable amount of time to create a sophisticated rule and class framework in AutoYaST to match the requirements of a huge deployment site. Not having to touch each target separately can save you a tremendous amount of time depending on the scope of your installation project.

As an alternative, and if user settings should be done during the first bootup, create preload images with kiwi and firstboot. Deploying such images could even be done by a PXE boot server specialized for this task. For more details, see <http://doc.opensuse.org/projects/kiwi/doc/>, *Chapter 27, Automated Deployment of Preload Images*, *Chapter 25, Automated Installation*, and *Chapter 24, Deploying Customized Preinstallations*.