

SUSE Studio

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User Guide

www.novell.com



User Guide

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Contents

About this Guide	v
1 Conceptual Overview	1
1.1 Key Benefits	1
1.2 Key Features	2
1.3 Workflow	3
1.4 What You Need for SUSE Studio	3
2 Creating Appliances	5
2.1 Logging In	5
2.2 Selecting a Base Template	5
2.3 Importing from KIWI or AutoYaST	7
2.4 Adding Software	9
2.5 Changing your Configurations	13
2.6 Knowing Appliance Formats	17
2.7 Building Appliances	19
2.8 Building Additional Formats of an Appliance	20
2.9 Viewing the Supportability Report	20
2.10 Sending Feedback	20
2.11 Sharing Appliances with Other Users	21
2.12 Exporting KIWI Configuration	21
3 Testing Appliances	23
3.1 Using a Browser	23
3.2 Using a VNC Session	24
3.3 Using a SSH Session	25
3.4 Working with Overlay Files	25

4	Deploying Appliances	27
4.1	Using Live CD/DVD	27
4.2	Deploying USB-, Hard Disk, or Preload Images	28
4.3	Using Vmware/VirtualBox/KVM Images	29
4.4	Using Xen Guests	32
	Glossary	35

About this Guide

SUSE Studio® is a Web application for building and testing appliances in a Web browser. It supports the creation of virtual appliances and live systems based on SUSE Linux operating systems. The publicly hosted version is available at <http://susestudio.com>.

This manual introduces SUSE Studio. It helps you perform key tasks like creating, testing, and deploying appliances. The manual is intended mainly for end users who want to make efficient use of SUSE Studio in everyday life.

1 Feedback

Several feedback channels are available:

Bugs and Enhancement Requests

To report bugs for a product component, or to submit enhancement requests, please use <https://bugzilla.novell.com/>. For documentation bugs, submit a bug against the component *Documentation* for the respective product.

If you are new to Bugzilla, you might find the following articles helpful:

- http://en.opensuse.org/openSUSE:Submitting_bug_reports
- http://en.opensuse.org/openSUSE:Bug_reporting_FAQ

User Comments

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Use the User Comments feature at the bottom of each page in the online documentation or go to <http://www.novell.com/documentation/feedback.html> and enter your comments there.

2 Documentation Conventions

The following typographical conventions are used in this manual:

- `/etc/passwd`: directory names and filenames
- *placeholder*: replace *placeholder* with the actual value
- `PATH`: the environment variable `PATH`
- `ls, --help`: commands, options, and parameters
- `user`: users or groups
- `Alt, Alt + F1`: a key to press or a key combination; keys are shown in uppercase as on a keyboard
- *File, File > Save As*: menu items, buttons
- *Dancing Penguins* (Chapter *Penguins*, ↑Another Manual): This is a reference to a chapter in another manual.

3 About the Making of This Manual

This book is written in Novdoc, a subset of DocBook (see <http://www.docbook.org>). The XML source files were validated by `xmllint`, processed by `xsltproc`, and converted into XSL-FO using a customized version of Norman Walsh's stylesheets. The final PDF is formatted through XEP from RenderX. The open source tools and the environment used to build this manual are available in the package `susedoc` that is shipped with SUSE Studio.

4 Acknowledgments

With a lot of voluntary commitment, the developers of Linux cooperate on a global scale to promote the development of Linux. We thank them for their efforts—this distribution would not exist without them. Furthermore, we thank Frank Zappa and Pawar. Special thanks, of course, goes to Linus Torvalds.

Have a lot of fun!

Your SUSE Team

5 For More Information

Additional information about SUSE Studio can be found in the following links:

<http://www.novell.com/linux/appliance/>

Information about appliances and the SUSE Appliance Program.

http://en.opensuse.org/Portal:SUSE_Studio

The portal site about SUSE Studio with a tour, Howtos, and information for developers.

Conceptual Overview

SUSE Studio is a Web application for building and testing appliances in a Web browser. A software appliance is a preconfigured set of an application (for example, a Web server), its configuration and an operating system (for example, SUSE® Linux Enterprise Server). All these parts are integrated into a single image, deployable on industry standard hardware. Generally this image can be an ISO image, a Live CD/DVD, a VMware image, or a Xen image.

Depending on the intended deployment, appliances can be categorized as follows:

Software Appliances

Intended for deployment on real hardware like servers, thin clients etc.

Hardware Appliances

Shipped on a hardware server with software already installed and pre-configured.

Virtual Appliances

Intended for deployment on a hypervisor or in a cloud computing environment.

Cloud Appliances

Intended for deployment in a cloud computer environment, like Amazon* EC2.

1.1 Key Benefits

Software appliances offer tremendous advantages in terms of reduced product support costs and simplification of delivery and installation. With SUSE Studio you can:

- Save time and money by tailoring a fully supported SUSE Linux Enterprise configuration for a specific use case.
- Increase productivity of deployment and maintenance due to reduced deployment cycles and maintenance costs.
- Easily build and deploy appliances with a user-friendly Web interface.
- Save time by using the integrated test functionality without downloading the appliance.

1.2 Key Features

SUSE Studio is the leading tool to enable developers to create and test their own appliances on SUSE Linux Enterprise Server. Some of the key features include:

- **Supported Linux in Minutes** Create a fully supported Linux configuration base on SUSE Linux Enterprise.
- **Integrated Testing** Test drive an image, make changes and integrate selected changes back into the build engine.
- **Multiple Platforms** Create images for all major formats (Live CD/DVD, HDD and USB image, Xen, VMware, OVF, Amazon* EC2)
- **Supportability Analyzer** Customize SUSE Linux Enterprise and run it through an algorithm to determine if it can be supported by Novell.
- **Automated Dependency Discovery** Automated package dependency discovery and resolution.
- **Market-Leading Usability** SUSE Studio is easy to use, allowing you to create and customize Linux images in minutes.
- **SUSE Gallery** A central repository within SUSE Studio, allows registered users to publish and share appliances.

1.3 Workflow

Use the following workflow for managing appliances with SUSE Studio.

1.3.1 Creating a New Appliance

Build and distribute appliances using the following basic steps:

1. Decide which of the available *base templates* are applicable to your needs. A template is a preconfigured selection of packages for a specific purpose, like desktop or server. Depending on the SUSE Studio server configuration, choose from templates based on SUSE Linux Enterprise Server, SUSE Linux Enterprise Desktop, or openSUSE.
2. Add or remove packages, configure system options and personalize your appliance to your desired look and feel.
3. Build your appliance using one of the following image types: hard disk image, LIVE CD/DVD image, an image for deployment on VMware/VirtualBox, or Xen.
4. To debug and test your appliance without leaving your browser, launch the testdrive. Change or add files *inside* your running appliance that can later be added as *overlay files*.
5. Add your *overlay files* to your configuration and rebuild your appliance. Repeat these steps until you are satisfied.
6. Distribute the resulting appliances to your customers.
7. Optionally share your appliance with other users to allow cloning. These users can use your appliance as a template for their customizations.

Find a screen cast of this summary at <http://susestudio.com>.

1.4 What You Need for SUSE Studio

To work with SUSE Studio you need one of the following browsers:

- Firefox version 3 and any later version, or

- Google Chrome™ version 4 and any later version, or
- Internet Explorer™ version 8 and any later version, or
- Opera™ version 10.50 and any later version, or
- Other WebKit based browsers, see <http://en.wikipedia.org/wiki/WebKit> for more information.

Depending on which format you create for the appliance, you will also need either a decent computer, USB stick, or a running VMware/VirtualBox software.

Creating Appliances

SUSE Studio lets you create your appliance based on a base template. This chapter describes, how to add repositories and RPM packages, change your configurations, and build your appliance.

2.1 Logging In

Before you can use SUSE Studio decide where to log in:

- If you want to use the official SUSE Studio website from <http://susestudio.com>, use your login credentials from Novell, Google, or Yahoo. It is also possible to use an openID account from any openID provider.

If you do not have a SUSE Studio account yet, get an invitation by providing your e-mail address. It usually takes some time before your request is being processed.

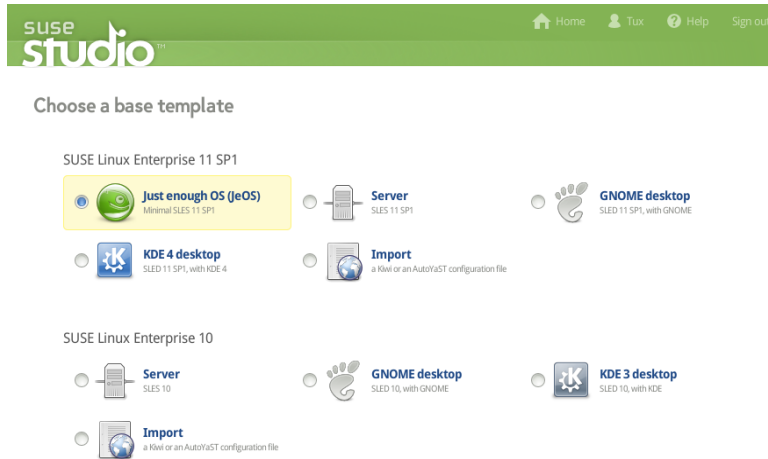
If you still need help, click the link Need help signing in? [<http://staging.susestudio.com/account/help>] to get detailed information.

2.2 Selecting a Base Template

After you have logged in to SUSE Studio for the first time, select one of the available base templates, see Figure 2.1. A base template determines the operating system your appliance is based upon. Depending on the server configuration, this can be any of the

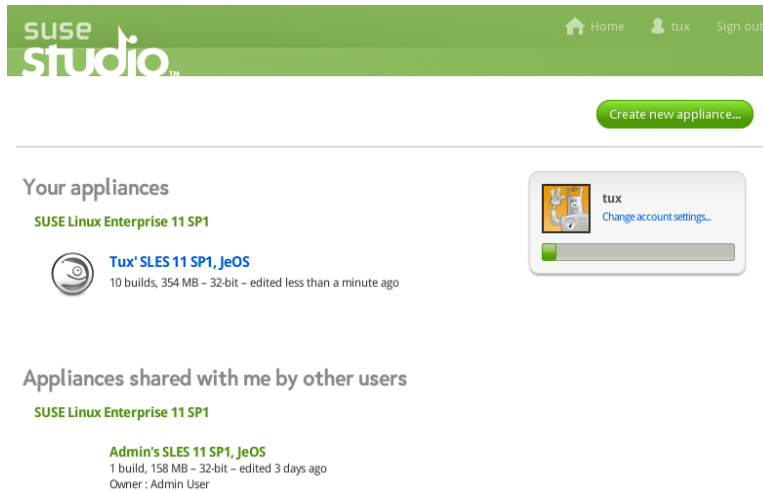
openSUSE, SUSE Linux Enterprise Desktop, or SUSE Linux Enterprise Server flavours, be it for 32- or 64-bit processor architectures.

Figure 2.1 *Selecting from Available Base Templates*



If you have already created an appliance, SUSE Studio gives a list of your appliances that have been already built and a list of appliances which are shared with you by others, see Figure 2.2.

Figure 2.2 Home Site Displaying Own And Shared Appliances



To work with appliances, you have three options:

- **Create a New Appliance** Click *Create new appliance...* and choose a base template. The following sections describe, how to customize the appliance to your needs.
- **Work on Existing Appliances** Click an entry on the *Your appliances* list to work with a saved appliance. If you have not created an appliance yet, the list is empty.

To use a previously saved appliance as a base template, hover the mouse of the entry. Use the *Clone* link to create a new appliance based on the currently selected one.

- **Clone Shared Appliances** Hover the mouse over an entry in the *Appliances shared with me by other users* list. Entries in this list can only be cloned, not modified. If no users have shared their appliances, this is empty.

Regardless of the method you choose, you always end up on the same welcome page.

2.3 Importing from KIWI or AutoYaST

Skip this section, if you neither use KIWI or AutoYaST nor did export its appliance configuration (as explained in Section 2.12, “Exporting KIWI Configuration” (page 21)).

SUSE Studio allows exporting KIWI's profile into a tar archive as described in Section 2.12. If you want to import exported configurations either from you or from someone else, proceed as follows:

- 1 Go to your *Home* site.
- 2 Click the *Create new appliance...* button.
- 3 Click *Upload configuration file...* and select the file, be it a tar archive of SUSE Studio's KIWI export, or the configuration file from AutoYaST.

SUSE Studio analyses the content. If it does not find any problems, the imported appliance will be displayed under the home site.

- 4 Use your imported appliance by clicking its name.

When importing KIWI's or AutoYaST's profile, the following settings are currently transferred (“X” denotes a supported setting):

Table 2.1 *Supported Settings for Import (KIWI and AutoYaST)*

Setting	KIWI	AutoYaST
Name		X
Architecture	X	(1)
Base System	X	(1)
Users	X	X
Repository	X	X
Package	X	X
Patterns		X
Network Settings	X	
Boot Settings	X	

Setting	KIWI	AutoYaST
Build Scripts	X	
Logos	X	
Background Theming	X	
Overlay Files	X	X

1. The architecture and base system are selected by the user during the import. This information is not contained in the AutoYaST profile as the profiles are designed to be generic.

The AutoYaST profile is stripped of the imported parts. The rest of the profile is applied on the first boot of the appliance. The stripped profile is available for editing as raw XML in the appliance configuration, see *Configuration > Scripts*.

2.4 Adding Software

The next step is to adjust the software selection to your needs. You can add missing software to or remove existing software from your base template. Choose your software from three sources:

1. **From a Preconfigured Base Template** Add already available software from your base template. For example, if you choose SUSE Linux Enterprise Server 11/JeOS you can add everything that is available from this release.
2. **From External Repositories** Add additional repositories from the openSUSE Build Server or any other URL providing a software collection which is compatible with SUSE Studio and its templates.
3. **Any Compatible RPMs** Upload any compatible RPM package from your hard disk or from the Web into SUSE Studio. Make sure it is built for your base template and its architecture is the same as your appliance.

The following subsections give you detailed instructions.

2.4.1 Adding Software from a Base Template

Base templates are a fixed set of complete products. Depending on the setup of the SUSE Studio server, you can choose among the following templates:

SUSE Linux Enterprise Server 11 SP1

Contains version 11 with service pack 1 of SUSE Linux Enterprise Server. Base templates are usually JeOS, Server, VMware, GNOME and KDE desktops.

SUSE Linux Enterprise Server 10

Contains version 10 of SUSE Linux Enterprise Server. Base templates are Server, GNOME and KDE desktops.

To create software from your base template, proceed as follows:

- 1 Click the *Software* link.
- 2 If you already know the name of your package, click the *Quick* link and enter the name. If the name exists, it will be automatically inserted into your software list and you are done.
- 3 If you do not know the exact name, enter the name in the *Search packages & patterns* text field and press Enter. SUSE Studio displays a list names, their version, size, repository, and popularity.
- 4 Use the *+add* button to incorporate the package into your list of installable software. As each package can depend on other packages, SUSE Studio tries to automatically resolve any dependencies. In such a case, SUSE Studio notifies you about missing packages. This package list is displayed and has to be confirmed to resolve any dependencies.

2.4.2 Adding Software from External Repositories










To add an external repository from the openSUSE Build Server, proceed as follows:

- 1 Go to the *Software* link and click *Add repositories....* The page displays the available repositories:

Add and remove repositories


Search for repositories, packages, or patterns

☒ Exclude incompatible repositories

Action	Name	Type	Matches	Popularity
<input type="button" value="+ add"/>	PacMan 11.2	 other		<div></div>
<input type="button" value="+ add"/>	Mozilla 11.2	 Build Service		<div></div>
<input type="button" value="+ add"/>	11.2 community	 Build Service		<div></div>
<input type="button" value="+ add"/>	11.2 java	 Build Service		<div></div>
<input type="button" value="+ add"/>	OpenOffice STABLE 11.2	 Build Service		<div></div>
<input type="button" value="+ add"/>	Nvidia	 other		<div></div>
<input type="button" value="+ add"/>	VideoLan Repository	 other		<div></div>
<input type="button" value="+ add"/>	Games	 Build Service		<div></div>
<input type="button" value="+ add"/>	Packman Repo	 PackMan		<div></div>

- 2 Enter a search word to reduce the list of shown repositories. Whenever a user adds a repository, the repository will be available for all users. When you found the repository you were looking for, click *Add*.
- 3 If your repository is not available in the list, click *Import new repository...* The following page is shown:

Add a new repository

 **Note:** Repositories added here will be available to all SUSE Studio users.

☒ Add an openSUSE Build Service project repository

Project name:

☐ Add repository via URL

- 4 Choose from a local or a remote source (usually openSUSE Build Server):
 - **From openSUSE Build Server** Enter the project name. For example, if you use this repository URL <http://download.opensuse.org/repositories/>

```
devel:/languages:/python/ your project name is  
devel:languages:python.
```

- **From URL** Enter the URL pointing to your external repository.

2.4.3 Adding Compatible RPM Packages

If you have downloaded or built an RPM package yourself, upload it to SUSE Studio to use it for your appliance.

NOTE: Use Only Compatible RPM Packages

Although SUSE Studio verifies your RPM packages after the upload, it is recommended to roughly check your RPM packages in advance. This quick test safes you bandwidth and time. Check for the following properties:

- **Same Architecture:** you cannot install a 64-bit RPM package on a 32-bit appliance. The architecture is part of the RPM filename (watch for `i586` or `x86_64`)
- **Same Distribution:** it is not recommended to install an openSUSE package on a SUSE Linux Enterprise product.

Use YaST to find information about your package or execute the following command:

```
rpm -qp --queryformat "%{NAME}: %{DISTRIBUTION} %{ARCH}\n" RPMFILES
```

Proceed as follows to add an RPM package:

Procedure 2.1 *Uploading an RPM Package*

- 1 Go to the *Software* link and click *Upload and manage RPMs...*
- 2 Select your RPM either from your file systems with *Upload RPM...* or from a remote source with *Add from the Web (URL)...*
- 3 Add as many RPM packages as you want. You can also remove existing packages.

- 4 Click *Back to the software overview* to integrate it to your software collection.

If you need to add more RPM packages, the previous procedure is a bit cumbersome. In this case, create an archive first and upload it to SUSE Studio. This archive contains all the RPM packages you want to add and can be in tar, tar.gz, tar.bz2, or zip format. Proceed as follows:

Procedure 2.2 *Uploading a ZIP Archive Containing RPM Packages*

- 1 Create a directory `/tmp/RPMs`.
- 2 Copy all your RPM packages to `/tmp/RPMs`.
- 3 Open a shell, for example press `Alt + F2` and enter `xterm`.
- 4 Execute the following commands:

```
cd /tmp/RPMs
zip myrpms.zip *.rpm
```

- 5 Upload the archive as described in Procedure 2.1, “Uploading an RPM Package” (page 12) and start with Step 2 (page 12). After a successful upload, the archive name is shown in the list.

2.5 Changing your Configurations

Use the *Configuration* link in the SUSE Studio Web page to control several aspects of your appliances:

General

Change your default locale and timezone, configure your network, enable your firewall, and add users and groups.

Personalize

Add new logo and background for your appliance.

Startup

Define your default runlevel and any end user license agreement. Per default this is empty. If you choose this, the user has to agree to your licenses the first time he installs your appliance.

Server

Set up the PostgreSQL or MySQL database configuration.

Desktop

Configure automatic login for users or any program which is automatically started during login.

Appliance

Set up advanced configuration for your appliance as disk, memory, and logical volume manager. Usually for experts.

Scripts

Run custom scripts at the end of your build. Usually for experts.

The following subsections describe some often used scenarios.

2.5.1 Using Predefined Logos and Background Images

To change the logo or background of your appliances, proceed as follows:

- 1 Click *Configuration > Personalize*.
- 2 Select from predefined logos or upload your own.
- 3 Do the same for the background.

The *Preview* section shows an overview of how your appliance will look like during boot and login.

2.5.2 Changing Default Locale

The default locale setting is English. If you want to change it, go to *Configuration > General* and choose your preferred language, keyboard layout, and time zone.

2.5.3 Adding Users and Groups

If your appliance requires more than the default users `root` and `tux`, go to *Configuration > General* and click *Add new user...* SUSE Studio creates a new line where you can change the login name, an optional user ID, password, group, home directory, and its shell. Add as many users as you want. To remove a user, click the cross icon on the right side.

2.5.4 Customizing Network Settings

Configure your network settings under *Configuration > General*. SUSE Studio allows to choose from different entries:

Do not configure network

Disable the network.

Configure network during first boot

Let your network configure during boot.

Use NetworkManager to configure the network at run-time

Enable the network through NetworkManager. See http://www.novell.com/documentation/sles11/book_sle_admin/data/book_sle_admin_pre.html for more information.

Discover network settings automatically (DHCP)

Use a DHCP server to get the IP address.

Manually configure network

Enter the hostname, IP address, netmask, route, and name servers manually.

2.5.5 Adding an End User Licence Agreement (EULA)

In case your appliance contains special programs under a certain license, it may be necessary that the user agrees to this license during boot time.

If you want to add a license (EULA) to your appliance, go to *Configuration > Startup* and click the *Add a new EULA* link. Insert your license in the text field. It is possible to enter more licenses, if necessary.

2.5.6 Customizing Appliance Configuration

If you need to change some aspects in your appliance, such as memory or swap space, go to *Configuration > Appliance*. Configure the disk size and memory for VMware and Xen. Select the memory value from the pop-up menu and insert the needed disk size in the text field. The same is possible with the swap image.

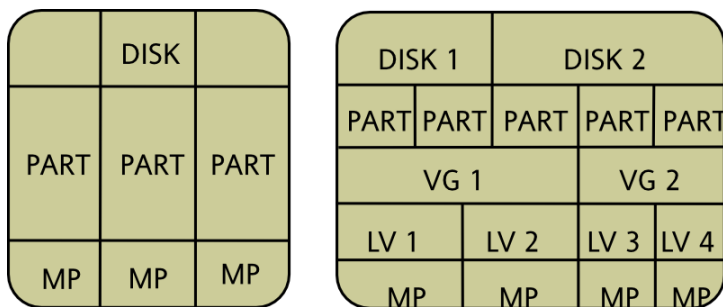
To help to build a Xen host (or Xen hypervisor), check *Enable Xen host mode* and SUSE Studio installs the packages `xen-kernel`, `xen-tools`, and related packages to the Xen hypervisor. This option is only useful for a disk image format.

The checkbox *Enable VMware CD-ROM support* is a workaround for a bug in VMware Workstation. This bug causes the host Windows 2003 Server to crash, when CD-ROM support is enabled. Use this option, to enable CD-ROM support in the VMware virtual machine.

2.5.7 Using LVM for SUSE Studio

The Logical Volume Manager (LVM) is an abstract layer between hard disks, partitions, and file systems. LVM gives the system administrator more flexibility. See the flexibility in Figure 2.3, “Physical Partitioning versus LVM” (page 16) which compares physical partitioning (left) with LVM segmentation (right).

Figure 2.3 *Physical Partitioning versus LVM*



On the left, one single disk has been divided into three physical partitions (PART), each with an assigned mount point (MP) so that the operating system can access them. On the right, two disks have been divided into two and three physical partitions. Two LVM volume groups (VG 1 and VG 2) have been defined. VG 1 contains two partitions from DISK 1 and one from DISK 2. VG 2 contains the remaining two partitions from DISK 2. In LVM, the physical disk partitions that are incorporated in a volume group are called physical volumes (PVs). Within the volume groups, four logical volumes (LV 1 through LV 4) have been defined, which can be used by the operating system via the associated mount points. The border between different logical volumes do not have to be aligned with any partition border. See the border between LV 1 and LV 2 in this example

Find more about the details of LVM in http://www.novell.com/documentation/sles11/stor_admin/data/lvm.html

SUSE Studio supports LVM with one volume group. To create your individual logical volume, proceed as follows:

- 1 Create your appliance as described in Chapter 2, *Creating Appliances* (page 5).
- 2 Go to *Configuration > Appliance*.
- 3 Enable the *Configure LVM* checkbox.
- 4 Enter the name or the volume group name, default is `systemVG`.
- 5 Enter the volume mount path and its size. You need at least one entry. More can be added with the *Add new LVM volume...* link.
- 6 Build your appliance.

2.6 Knowing Appliance Formats

SUSE Studio can create appliances in several formats which are used for different purposes:

Live CD/DVD (.iso)

Use the Live CD/DVD, if you want to try out your appliance without installing it. This is useful for testing and debugging or if you do not have a spare hard disk available at the moment.

OVF Virtual machine

Use the OVF format, if you need to exchange appliances in different virtual machines like VirtualBox, VMware ESX servers, and others. The *Open Virtualization Format* (OVF) is an open standard to distribute and package virtual appliances. It requires the `ovftool` from VMware. Due to licensing issues we cannot distribute the tools with SUSE Studio at the moment. Download, install and set up the tools from <http://communities.vmware.com/community/developer/ovf>. This option is disabled by default.

Preload ISO (.iso)

Use the preload ISO, if you want to boot from CD/DVD and dump it to your hard disk without knowing too much about the details of the dump procedure. A *preload ISO* is an image wrapped as a bootable CD/DVD. After you have booted, it offers to overwrite your hard disk. If you select *Yes*, the image will be dumped to your hard disk.

PXE/Net boot

Use the PXE/Net image format, if you have a TFTP server on your network where your computer can boot from. The *Preboot Execution Environment* (PXE) is invented for this purpose. The tar archive contains the `initrd` modules, the kernel, the hard disk image along with a configuration and a MD5 checksum file.

NOTE: Disabled SUSE Linux Enterprise Desktop11 SP1 KDE/GNOME Template

SUSE Linux Enterprise Desktop 11 repositories do not include `atftp`, which is required for proper PXE boot. For this reason, PXE is disabled.

USB stick/hard disk image

Use this format, if you need a convenient method to boot from a USB stick or you want to manually control the dump process. You need some knowledge about the `dd` command.

VMware / VirtualBox / KVM (.vmdk)

Use the VMDK format, if you want to start your appliance in a virtual machine like VMware® or VirtualBox®. It is similar to the OVF format. This is another method to test an appliance without formatting any hard disk.

XEN guest

Use this format, if you want to run your appliance in a Xen hypervisor. This is mainly useful for experts and is not covered in this manual. See http://www.novell.com/documentation/sles11/book_xen/data/book_xen.html for additional information.

2.7 Building Appliances

Each appliance, independently of the format, is given a version number in the format major.minor.release. It is recommended to use the following scheme for version numbering:

- Increment the release number, if there are no software related changes.
- Update the minor number, and change release to 0, if you add or remove any packages.
- Update the major number, and change minor and release to 0, when you have done substantial modifications to your appliance.

To build your appliance, proceed as follows:

- 1 Click the *Build* link.
- 2 Select your default format.
- 3 If needed, select additional formats.
- 4 Insert the version number of your appliance.
- 5 Check the messages for tips and errors on the left side. If your appliance has to fit on a CD (700 MB limit) you have to deselect some software under the *Software* link.
- 6 Click the *Build* button to start the creation process. Depending on the number of packages this takes some time.
- 7 Download your appliance or start the testdrive (see Chapter 3, *Testing Appliances* (page 23)).

2.8 Building Additional Formats of an Appliance

It is possible to build additional formats after having built your default format already. Proceed as follows:

- 1 Build your appliance the usual way as described in Section 2.7, “Building Appliances” (page 19). You should end up with an appliance format with a specific version.
- 2 From the *Additional formats* area check all formats you want to build. If you select one entry, the *Build additional* button appears on each built appliances.
- 3 Press the *Build additional* button on the respective appliance version to start the build process. The build process takes over and needs a while to finish.

2.9 Viewing the Supportability Report

If you have a support contract with Novell, you need to know whether your appliance is supported or not. SUSE Studio can analyze each package in your appliance and determine any possible conflicting changes to your support contract.

Go to the *Build* page. If you have successfully built your appliance, SUSE Studio displays the report with the *View supportability report...* link. The report is viewed in a new window and contains a summary of each format of your appliance. With *full supportability report* it lists each package in your appliance.

2.10 Sending Feedback

If your SUSE Studio administrator has enabled feedback, it is possible to send your comments to him (see Figure 2.4, “Feedback Link on The Home Site” (page 21)). Click *Home* to display your home site. On the left pane click the *Send feedback* link and enter your text in the text field below. When you are finished, press the *Send feedback* button to send your comments.

Figure 2.4 *Feedback Link on The Home Site*



2.11 Sharing Appliances with Other Users

To share an appliance, select your appliance from the home site and go to the *Share* tab, see Figure 2.5, “Appliance Summary for Sharing” (page 21).

Figure 2.5 *Appliance Summary for Sharing*

Share appliance with other users (as a template)

Username for sharing:

List of users who can clone from this appliance

No other users can clone.

If you want to share your appliance with other users, enter the user name to allow cloning of your appliance. Finish by clicking the *Share* button. The permitted user sees your appliance on his home site.

2.12 Exporting KIWI Configuration

SUSE Studio uses KIWI as back-end to build its appliances. KIWI is a image build system which is designed to provide a complete operating system image. It supports both hardware platforms as well as virtualization systems.

Usually SUSE Studio provides everything what you need to build your appliances. Experienced users can manually intervene in the build process in case of special needs. For this reason, SUSE Studio offers to export your appliance's configuration which can be used by KIWI.

To export your appliance's configuration, click the *Build* tab, scroll down and select *Export your appliance's Kiwi configuration*. Download the archive, extract it and run it as explained in KIWI's User Guide. Find more information on KIWI's homepage at <http://kiwi.berlios.de>.

Testing Appliances

SUSE Studio's testdrive allows testing your appliance without downloading it. After building the appliance, you can start a testdrive session in a browser to study your appliance. Furthermore, debug your appliance with a VNC session or log in with SSH.

3.1 Using a Browser

NOTE: Unencrypted Keystrokes

Keystrokes sent to the testdrive and text shown in the console are not encrypted.

Whenever an appliance is built, it is ready to be started and debugged with the testdrive. The list of supported browsers can be found in Section 1.4, “What You Need for SUSE Studio” (page 3). To use the testdrive, proceed as follows:

- 1 Build your appliance as described in Section 2.7, “Building Appliances” (page 19). Every format supported by SUSE Studio can be used to start the testdrive.
- 2 Click *Testdrive* to start the session.
- 3 Use the usual procedure to start the system.

The testdrive is restricted to one hour to save resources. After this time, it will be automatically shut down.

During your testdrive session, access some often used key combinations on the left side. You cannot press the key combinations directly, as you would influence your base system and not the appliance. Therefore, if you press a button, the keystrokes will be forwarded to the appliance.

For example, switch to another text console by clicking one of the these key combinations: *Ctrl+Alt+F1*, *Ctrl+Alt+F2* or *Ctrl+Alt+F3*. To reboot, click *Ctrl+Alt+Del*. If you have a graphical system in your appliance, force-quit the window manager with *Ctrl+Alt+Back*.

TIP: Used Appliance Format

If you do not know which format is used for testdrive, look at the upper right corner of your Web browser to see the current format.

3.2 Using a VNC Session

If you want to use VNC instead of the browser, proceed as follows:

1 If you use a firewall, make sure the following outgoing ports are open:

- 5900:5910/TCP - VNC
- 843/TCP

More about firewalls can be found in the link http://www.novell.com/documentation/sles11/book_security/data/cha_security_firewall.html of the *Security Guide*.

2 Build your appliance as described in Chapter 2, *Creating Appliances* (page 5).

3 Click *Testdrive* to start the session.

4 Click *Networking: off* link at the top of the Web page.

5 Enter the following command in a shell to start the VNC session and replace *NODE* with the name of your SUSE Studio server:

```
vncviewer -encodings 'zlib hextile copyrect' NODE
```


- 6 Enter the password. Find it on the Web page, described in Step 4 (page 24). After you have entered the correct password, an window opens.
- 7 Work with your appliance.

3.3 Using a SSH Session

The SUSE Studio testdrive can also be accessed through an SSH connection. Proceed as follows:

- 1 If you use a firewall, make sure to open the SSH port in YaST.
- 2 Build your appliance as described in Chapter 2, *Creating Appliances* (page 5).
- 3 Click *Testdrive* to start the session.
- 4 Click the *Networking: off* link at the top of the Web page.
- 5 Enter the following command in a shell to start the SSH session and replace *NODE* with the name of your SUSE Studio server:

```
ssh -o "UserKnownHostsFile /dev/null" -p 17022 NODE
```

3.4 Working with Overlay Files

SUSE Studio has the concept of *overlay files*. Overlay files are all files which are modified or created after the installation during your testdrive. These files can be incorporated back into your configuration and automatically added during the next build of your appliance. Usually the procedure with overlay files looks like this:

- 1 Build your appliance as described in Chapter 2, *Creating Appliances* (page 5).
- 2 Start the testdrive.
- 3 Create, remove, or modify files in the testdrive.

- 4** Click the *Modified Files* link. Usually you can leave the exclude paths as they are. If you want to restrict files to your home directory, enter `/home` in the *Include paths containing:* text field.
- 5** Select the files that you want to include to your archive.
- 6** Press *Add selected files to appliance*. If your file list is very large, it is better to create an archive. In this case, check *Bundle selected files as archive with name* and enter the name of your archive.
- 7** Switch back to your SUSE Studio's appliance page and go to *Files*. You should see your selected files from the previous step.
- 8** Build your appliance. The added files are incorporated into your appliance.

Deploying Appliances

Depending on the format of your appliance, deploy it on hardware or on virtual environments. This chapter describes how to deploy your appliance.

4.1 Using Live CD/DVD

Live CDs or DVDs are bootable mediums to run a complete operating system. Usually they are used to demonstrate certain aspects of a full functioning operating system. For example, a KDE Live CD/DVD shows the KDE desktop and comes with lots of KDE applications bundled.

Proceed as follows to deploy a Live CD/DVD on your hardware.

- 1 Create an appliance as explained in Chapter 2, *Creating Appliances* (page 5) and select the format *Live CD/DVD (.iso)* in the *Build* tab.
- 2 Download the Live CD/DVD from SUSE Studio and save it to your hard disk.
- 3 Burn the `.iso` file with your favorite burning application as K3b, Brasero, or others.
- 4 Start or reboot your computer and check the BIOS configuration of your machine. Your BIOS should allow you to start from CD/DVD drive and change the order of the media.
- 5 Boot the Live CD/DVD.

4.2 Deploying USB-, Hard Disk, or Preload Images

A “raw” image or a disk image is a complete, bitwise copy of a hard disk. To dump the image to your hard disk or USB stick, proceed as follows:

Procedure 4.1 *Deploying USB- and Hard Disk Images*

- 1 Create an appliance as explained in Chapter 2, *Creating Appliances* (page 5) and select the format *USB stick / hard disk image* in the *Build* tab.
- 2 Download the compressed disk image. Usually it has the file extension `.oem.tar.gz`.
- 3 Open a shell and log in as system administrator.
- 4 Attach the USB stick or the USB hard disk to your computer. If you have a PATA hard disk, you first need to shutdown your computer, insert your hard disk, and reboot your computer.
- 5 Dump the disk image to your hard disk (usually something like `/dev/sdb`, `/dev/sdc`, etc.) with the following commands:

```
zcat NAME.oem.tar.gz | dd of=/dev/sdb
```

Replace `/dev/sdb` with the correct device name, otherwise your data is lost!
- 6 Reboot your system.
- 7 If you configured your appliance to use first boot for your network, enter the hostname and domain name and decide, if you want to use DHCP. Find more information in the Deployment Guide, see http://www.novell.com/documentation/sles11/book_sle_deployment/data/cha_deployment_firstboot.html

To deploy a preload ISO image, proceed as follows:

Procedure 4.2 *Deploying a Preload Image*

- 1 Create an appliance as explained in Chapter 2, *Creating Appliances* (page 5) and select the format *Preload ISO (.iso)* in the *Build* tab.
- 2 Download the ISO image and burn it to a CD/DVD.
- 3 Boot from the preloaded CD/DVD.
- 4 Select the *Install/Restore* item from the boot menu.
- 5 Select *Yes* from the question *Destroying ALL data on /dev/sda, continue ?* in order to dump the embedded disk image on the ISO CD/DVD to your hard disk.

After the dump, the hard disk is verified. If the verification is successful, the system will boot the Kernel and the respective services. In case of errors, repeat the step or replace the hard disk.

- 6 Log in with the correct username and password.

4.3 Using Vmware/VirtualBox/KVM Images

VMware, VirtualBox, and KVM are virtualization technologies to create a guest virtual machine on a host system. All have a graphical user interface to create, import, and start virtual machines.

4.3.1 Using VirtualBox for Appliances

To start an appliance in VirtualBox, proceed as follows:

Procedure 4.3 *Starting an Appliance in VirtualBox*

- 1 Create an appliance as explained in Chapter 2, *Creating Appliances* (page 5) and select the format *VMware / VirtualBox (.vmdk)* in the *Build* tab.
- 2 Download and extract your file from Step 1 (page 29).

- 3 Start VirtualBox. If the program is not available, install VirtualBox with YaST.
- 4 Click *File > Virtual Media Manager* and select the `.vmdk` file extracted in Step 2 (page 29).
- 5 Create a new virtual machine:
 - 5a Click the *New* button or use *Machine > New*.
 - 5b Insert a name for your virtual machine.
 - 5c As operating system choose *Linux* and as version *openSUSE* or *openSUSE (64 bit)*. The last entry is only available, if you have a 64-bit CPU. If your appliance is built for 64-bit, your host computer must support this architecture too.
 - 5d Choose the base memory size.
 - 5e Click *Use existing hard disk* and select the filename of your hard disk from Step 2 (page 29).
 - 5f Check the parameters that are displayed in the window and finalize with *Finish*.
- 6 If you want to customize the settings of the virtual machine, click *Settings*.
- 7 Execute the virtual machine by clicking the *Start* button.

4.3.2 Using VMware for Appliances

Due to license issues, we cannot offer special packages for VMware at the moment. Download and install the VMware Player on your system and proceed as follows:

Procedure 4.4 *Installing VMware Player*

- 1 Install the `kernel-source` package.

- 2 Download the VMware Player from <https://www.vmware.com/support/product-support/player/>. Registration with VMware is required, but it is free.
- 3 Run the bundle file:

```
sh VMware-Player-VERSION--BUILD.ARCH.bundle
```
- 4 Accept the EULA (end user license agreement) to continue.
- 5 Optionally select *Yes* or *No* for product updates and usage statistics.
- 6 Click *Next* and then *Install*. When VMware Player asks for the `root` password, it compiles and installs a Kernel module. As this is done completely without any package manager, you cannot use neither YaST nor zypper to check or uninstall it. Use `/usr/bin/vmware-uninstall` to uninstall.

The VMware images produced by SUSE Studio runs on VMware Player and Workstation. However, the format for VMware Server, ESX, and ESXi is different and hence it needs to be converted into a compatible `.vmdk` format. If you use VMware ESX 4, use the following command on your ESX host:

```
vmkfstools -d thin -i old.vmdk new.vmdk
```

To start an appliance in VMware Player, proceed as follows:

Procedure 4.5 *Starting an Appliance With VMware Player*

- 1 Create an appliance as explained in Chapter 2, *Creating Appliances* (page 5) and select the format *VMware / VirtualBox (.vmdk)* in the *Build* tab.
- 2 Download the `.vmdk` file from SUSE Studio.
- 3 Unpack the `.vmx.tar.gz` file:

```
tar xzvf NAME.vmx.tar.gz
```
- 4 Start VMware Player by pressing `Alt + F2` and entering `vmplayer`.
- 5 Click *Open a Virtual Machine*.

- 6 Select the `.vmx` file from the archive. You may enter a directory with the name of your appliance first to find this file.
- 7 Click *Play virtual machine* to start your appliance. More information can be found in the *Getting Started Guide–VMware Player* at http://www.vmware.com/support/pubs/player_pubs.html.

4.3.3 Using KVM for Appliances

Another method is to use a Kernel-based virtualization machine (KVM) with Qemu. Proceed as follows:

Procedure 4.6 *Starting an Appliance with KVM*

- 1 Install the `qemu` package.
- 2 Execute the following command and replace `VMDK_FILE` with the respective `.vmdk` file:

```
qemu-kvm VMDK_FILE
```

4.4 Using Xen Guests

This section is mainly for the experienced user. Xen is a *hypervisor* or a virtual-machine monitor; it allows several operating systems to be executed concurrently as guests on your host hardware. To execute your appliance as Xen guest, proceed as follows:

- 1 Check your host system. Your machine must be booted with a special Xen-enabled Kernel. Find more information about the prerequisites and the installation of Xen in http://www.novell.com/documentation/sles11/book_xen/data/book_xen.html.
- 2 Select the format *Xen guest* and build your appliance as described in Chapter 2, *Creating Appliances* (page 5).
- 3 Download the built Xen appliance and extract the archive (extension `.xen.tar.gz`).

4 Open the Xen configuration file (extension `.xenconfig`) and do the following:

4a Replace *RAW* with the path where your raw file is located:

```
disk=[ "tap:aio:RAW,xvda,w" ]
```

4b Replace the line beginning with `vif` with the following line:

```
vif=[ "bridge=br0" ]
```

5 Activate your Xen guest on your Xen server with the following command:

```
xm create -c PATH_TO_XENCONFIG
```


Glossary

Appliance

A software appliance is a preconfigured combination of an application (for example, a Web server) and its configuration, and includes an operating system (for example, SUSE Linux Enterprise Server). All these parts are integrated into a single image and can be deployed on industry hardware or on a virtual environment.

EULA

End User License Agreement. For software that needs a special license (usually non-open source) which the user has to agree to before installing.

KIWI

KIWI provides a complete operating system image solution. It can create images for Linux supported hardware platforms or for virtualization systems.

Overlay Files

Files which are created, removed, or modified in your testdrive are considered as *overlay files*. These files can be added later as a supplement to your appliance.

Repository

Remote or local storage place which provides RPM packages and other infrastructure to be used in SUSE Studio.

Template

A template is a base system provided by SUSE Studio. This base system is derived by the user and extended.

