

SLES Minimal VM Quick Start

The following document provides an overview of SLES Minimal VM (formerly known as JeOS) and describes the setup procedure.

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Contents

- 1 Introduction 2
- 2 Available image flavors 5
- 3 Installing and running SLES Minimal VM on KVM 9
- 4 Using Combustion with SLES Minimal VM 13
- 5 Legal notice 14
- 6 GNU Free Documentation License 14

1 Introduction

SLES Minimal VM refers to a minimal customizable operating system that is tailored for a specific usage scenario: a container host, a virtual machine guest, an appliance base, or a small server image. SLES Minimal VM acts as a foundation for building systems for use in a data center, creating desired virtual application images or appliances. You can choose what packages and components to install based on a specific use case. To that end, SLES Minimal VM provides access to all regular software repositories.

If you already have SUSE Linux Enterprise Server certification, you are automatically certified for SLES Minimal VM, as it is derived from the same code base. SLES Minimal VM allows you to reduce the operating system to the packages essential for the specific usage scenario. This minimizes the number of packages and patches that need to be managed and applied. By removing unnecessary packages, you also reduce the number of potential vulnerabilities, thus making the resulting system more secure. Reducing the system's footprint also results in lower resource consumption and improved performance.

SLES Minimal VM is delivered as preconfigured and ready-to-run virtual machine images. The system comes with the JeOS Firstboot wizard for configuring system locales and the root password during the first boot. SLES Minimal VM ships with the SSH server enabled and excluded from the firewall configuration. The supplied KIWI NG templates make it possible to create customized SLES Minimal VM images.

SLES Minimal VM provides ready-to-deploy server images on the AMD64/Intel 64 architecture for the following usage scenarios:

- KVM/Xen with HVM
- Xen Paravirtualized
- Microsoft Hyper-V
- VMware
- OpenStack Cloud

1.1 System requirements

The minimum SLES Minimal VM system requirements are similar to SUSE Linux Enterprise Server. For more information, refer to *Book "Deployment Guide", Chapter 2 "Installation on AMD64 and Intel 64", Section 2.1 "Hardware requirements"*.

1.2 Differences between SLES Minimal VM and SUSE Linux Enterprise Server

There are several significant differences between SLES Minimal VM and SUSE Linux Enterprise Server.

DIFFERENCES BETWEEN SLES MINIMAL VM AND SUSE LINUX ENTERPRISE SERVER

JeOS Firstboot

SLES Minimal VM comes with the JeOS Firstboot tool, which can be used to configure basic settings during the first boot. This includes keyboard layout and language, time zone, and root password.

The default network configuration is set to use DHCP, and the system automatically creates a Btrfs snapshot of the initial configuration.

kernel-default-base

Because of size constraints, SLES Minimal VM images use the kernel-default-base as the default kernel. Since the kernel does not contain drivers for bare metal, this allows for a smaller footprint.

If a specific usage scenario requires any of the omitted modules, install the kernel-default package to get a full tree of the kernel modules. This is the same kernel used by a regular SUSE Linux Enterprise Server installation.

No repositories by default

When installing a SUSE Linux Enterprise Server from the installation media, the system automatically sets the installation media as the default offline channel.

SLES Minimal VM has no channel by default, and you need to register your system to access online channels. Refer to *Book "Deployment Guide", Chapter 10 "Registering SUSE Linux Enterprise and managing modules/extensions", Section 10.3.2 "Registering with SUSEConnect"* for further information.



Note

The JeOS Firstboot, jeos-licenses and live-langset-data packages receive updates only if the Development Tools Module is enabled. However, these packages are not essential for running SLES Minimal VM instances, so they can be removed or left untouched.

Zypper configuration

SLES Minimal VM is a slimmed-down version of SUSE Linux Enterprise Server. The reduction in size is achieved in part by enabling the following two options in `/etc/zypp/zypp.conf`: `rpm.install.excludedocs = yes` (excludes all files marked as documentation from being installed by default) and `solver.onlyRequires = true` (disables installation of suggested and recommended packages by default).

Base packages

SLES Minimal VM images are built using the KIWI NG tool. KIWI NG's configuration files, called templates, explicitly list packages that must be included in the images. Keep in mind that these base packages pull their dependencies during the image building process. Therefore, the list of preinstalled packages in an image usually contains more packages than the list of base packages.

The KIWI NG configuration files used to create the official SLES Minimal VM images are available from the openSUSE Build Service at <https://build.opensuse.org/> (https://build.opensuse.org/package/view_file/SUSE:SLE-15-SP4:GA/kiwi-templates-Minimal/Minimal.kiwi?expand=1).⁷



Note: Specific host tools packages

Each SLES Minimal VM flavor contains certain host tools packages. Refer to the specific flavors section in the documentation for further information.

Disk layout

Unlike SUSE Linux Enterprise Server, which calculates the disk layout during installation, SLES Minimal VM features the following fixed virtual image partitioning scheme:

- 2 MB BIOS boot
- 33 MB EFI system
- 24 GB Linux file system

To get additional disk space, you can either extend the existing disk from the virtual host or add a secondary disk to the virtual machine. If you choose the latter option, you must partition and format it manually.

systemd-coredump disabled

Due to the limited amount of memory and disk space available by default on SLES Minimal VM images, systemd-coredump is disabled by default on SLES Minimal VM images. To collect application core dumps necessary for troubleshooting, follow these steps:

- Install the `systemd-coredump` package, which contains `/usr/lib/sysctl.d/50-coredump.conf`
- To apply the configuration changes to your system, reboot or use the `sysctl --system` command.

For further information, refer to <https://documentation.suse.com/sles/html/SLES-all/cha-tuning-systemd-coredump.html>.

2 Available image flavors

Ready-to-use SLES Minimal VM images are available for the x86_64 architecture only. You can download SLES Minimal VM for the following deployment targets:

- Fully Virtual SLES Minimal VM for KVM and Xen (FV/HVM)
- SLES Minimal VM for VMware
- SLES Minimal VM for Microsoft Hyper-V
- SLES Minimal VM for OpenStack
- Paravirtual SLES Minimal VM for Xen (PV)



Important: Supported virtualization hosts (hypervisors)

SLES Minimal VM can run as a virtualization guest on the same virtualization hosts (hypervisors) as SUSE Linux Enterprise Server.

2.1 SLES Minimal VM Image for OpenStack Cloud

SLES Minimal VM for OpenStack Cloud is an image designed specifically for use in an OpenStack environment.

Instead of the JeOS Firstboot tool, SLES Minimal VM for OpenStack Cloud uses cloud-init (<https://cloudinit.readthedocs.io/en/latest/#>)  for configuring the image. The image also uses the XFS file system and the following kernel configuration:

```
"plymouth.enable=0 console=ttyS0,115200 console=tty0 net.ifnames=0"
```

This means that the image ships without packages required by JeOS Firstboot and Btrfs. SLES Minimal VM for OpenStack Cloud includes several OpenStack-related packages, such as cloud-init, cloud-init-config-suse, and xfspgfs.

2.1.1 cloud-init basics

cloud-init automatically applies custom configuration to running instances. The tool features a wide range of configuration modules, and it can execute specific commands in the image during the boot phase.

The default configuration for cloud-init is part of the cloud-init-config-suse package, and it is located in the /etc/cloud/cloud.cfg directory.

2.1.2 cloud-init configuration examples

By default, cloud-init does not set a root password. Instead, it creates a user account called sles that acts as the default user and has sudo rights. Use the following example to create passwords for both users.

EXAMPLE 1: ADD PASSWORDS

```
#cloud-config
chpasswd:
  list: |
    root:$6$SaLTsaLt$miA./Q1ilmKR0sYicn/yAzNHP6y32Jj0dVIn5agAiaEKaSaZdC3X6CVTW2d/
    xslQfevCc20teWLurq12x8mbe1
    sles:$6$SaLTsaLt$.cuqsgjNGxHJZSLmVqkI/
    j9.kWIiUQHqjLRswbHjTw9hIXdPomgey2DHZmp6Ho6wgqIKz3ufb0IKdQCnQHPSA1
  expire: False
```

To create the SHA-512 hashes used in the example, run the command: openssl passwd -6 -salt SaLTsaLt PASSWORD.



Warning: User passwords

To avoid potential security risks, do not use passwords in production environments. Even when using hashed passwords, you are exposed to dictionary attacks. For better security, use SSH authentication instead of passwords.

When creating users, keep in mind that logging in with a password is disabled by default, and that the newly created users do not have sudo rights.

The following examples show configurations for creating various users.

EXAMPLE 2: NEW USER WITH PASSWORD AND SUDO

```
#cloud-config
users:
  - default
  - name: USER
    shell: /bin/bash
    groups: users
    # lock_passwd: Disable password login. Defaults to true
    lock_passwd: false
    passwd: $6$SaLTsaLt$.cuqsgjNGxHJZSLmVqkI/
j9.kWiIUQHqjLRswbHjTw9hIXdPomgey2DHZmp6Ho6wgqIKz3ufb0IKdQCnQHPSA1
    sudo: ALL=(ALL) NOPASSWD:ALL
```

EXAMPLE 3: NEW USER WITH SSH KEYS AND SUDO

```
#cloud-config
users:
  - name: USER
    shell: /bin/bash
    groups: users
    ssh_import_id: None
    lock_passwd: true
    sudo: ALL=(ALL) NOPASSWD:ALL
    ssh_authorized_keys:
      - SSH_PUBLIC_KEY_1
      - SSH_PUBLIC_KEY_2
```

To connect and register with the SUMA, RMT, or SUSEConnect, use the `runcmd` module to run the desired commands, for example:

```
#cloud-config
runcmd:
```

```
- SUSEConnect -r REGISTRATION_CODE -e EMAIL_ADDRESS
```

For further information, see <https://documentation.suse.com/sles/html/SLES-all/cha-register-sle.html>.

For RMT, the configuration is as follows:

```
#cloud-config
runcmd:
- curl http://RMT_SERVER/tools/rmt-client-setup \ --output rmt-client-setup
- sh rmt-client-setup https://RMT_SERVER/
```

For further information, see <https://documentation.suse.com/sles/html/SLES-all/cha-rmt-client.html>.

For SUMA, the configuration is as follows:

```
#cloud-config
runcmd:
- curl -O http://suma01/pub/bootstrap/bootstrap.sh
- /bin/bash bootstrap.sh
```

For further information, see <https://documentation.suse.com/external-tree/en-us/suma/4.0/suse-manager/client-configuration/registration-bootstrap.html>.

Finally, the following example shows a configuration that installs a package and starts a service during the first boot.

```
#cloud-config
packages:
- qemu-guest-agent
runcmd:
- systemctl enable qemu-guest-agent.service
- systemctl start --no-block qemu-guest-agent.service
```

2.2 KVM/Xen and Xen flavor

The SLES Minimal VM image for KVM/Xen and Xen ships with the following packages:

- xen-tools-domU
- grub2-x86_64-xen
- xen-libs

2.3 Microsoft Hyper-V flavor

The SLES Minimal VM image for Microsoft Hyper-V ships with `hyper-v`.

2.4 VMware flavor

The SLES Minimal VM image for VMware ships with `open-vm-tools`.

3 Installing and running SLES Minimal VM on KVM

Provided you have KVM installed on your local machine, you can use a ready-made SLES Minimal VM image to create a virtual machine. This allows you to experiment with SLES Minimal VM safely.

Download a 60-day trial SLES Minimal VM image for KVM at <https://www.suse.com/products/server/jeos/>.

Refer to the following procedure to create a SLES Minimal VM virtual machine in KVM.

PROCEDURE 12: CREATING A SLES MINIMAL VM VIRTUAL MACHINE

1. Launch Virtual Machine Manager and choose *File > New Virtual Machine*.
2. Select *Import existing disk image* and click *Forward*.
3. Click the *Browse* button next to the *Provide the existing storage path* field.
4. Click the *Add Pool* button, and in the *Create Storage Volume* dialog box, give the new pool a name, and select *dir: Filesystem Directory* from the *Type* drop-down list. Leave the *Target Path* option at its default value. Click *Finish*.

Create a new virtual machine
Step 2 of 4

Provide the existing storage path:

/home/dpopov/Downloads/SLES15-SP6-Minimal-VM.x86_64-kvm- Browse...

Choose the operating system you are installing:

Q SUSE Linux Enterprise 15 SP6

Cancel Back Forward

5. Select the created storage pool, click the *Browse Local* button, and select the SLES Minimal VM qcow2 image. Specify the correct operating system in the *Choose the operating system you are installing* field, and click *Forward*.
6. When prompted, set the RAM value to 1024, and the number of CPUs to 1. Click *Forward*.

Create a new virtual machine
Step 3 of 4

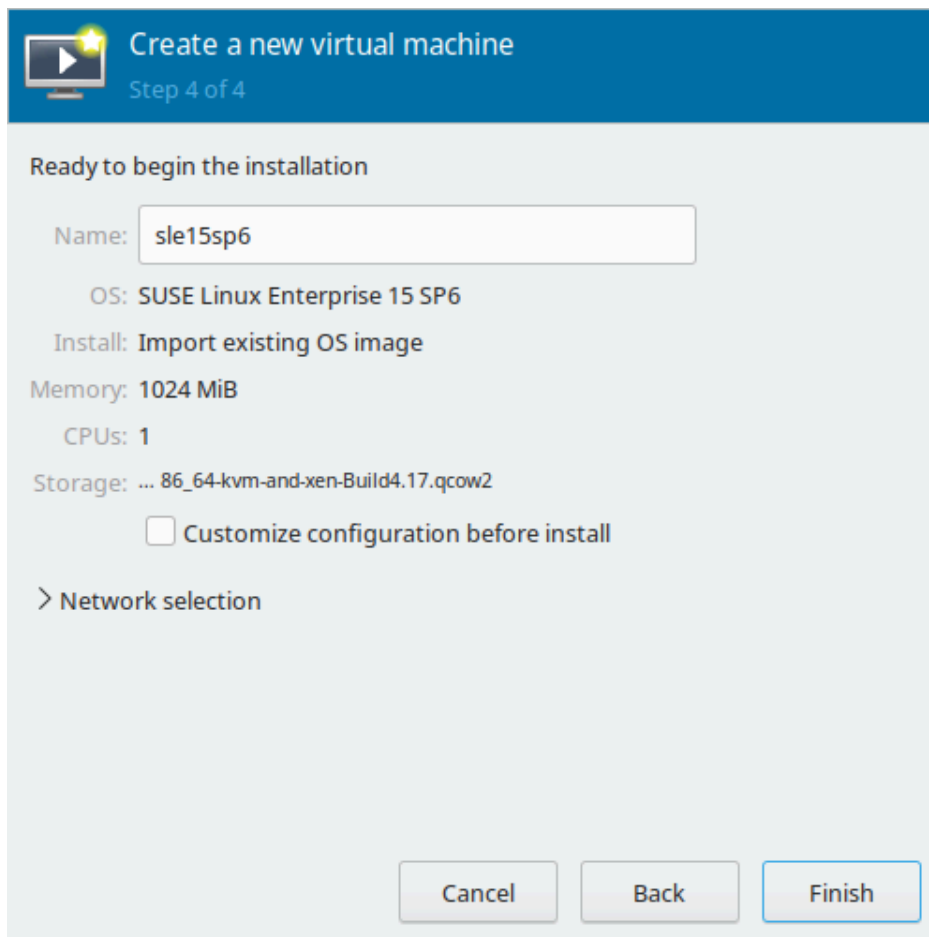
Choose Memory and CPU settings:

Memory: 1024 — +
Up to 15200 MiB available on the host

CPUs: 1 — +
Up to 16 available

Cancel Back Forward

7. Give the new virtual machine a name (for example, Minimal VM) and click *Finish*.



8. If prompted to start the virtual network, click *Yes*.

After the system is booted, JeOS Firstboot guides you through the initial system setup.



Note: Change locale

The SLES Minimal VM image comes with the `en_US` locale only. You can install and select the desired system locale after the setup is completed by installing the `glibc-locale` package and running the `localectl set-locale LANG=LOCALE` command (replace `LOCALE` with the desired language locale, for example, `de_DE.UTF-8`).

1. As the first step, you are prompted to select the appropriate keyboard layout using the keyboard selection dialog.
2. Next, read and accept the License Agreement. You cannot proceed without accepting the license agreement.

3. Specify the desired time zone.
4. When prompted, specify and confirm the desired root password.
5. As the last step, you are instructed to register your system. If you only plan to test SLES Minimal VM, you can skip registration.
6. After the initial configuration is completed, you can log in to the system as `root`, using the password you specified during the setup procedure.



Tip: Installing product patches after first boot

After SLES Minimal VM has been successfully installed and registered, we highly recommend to install the latest available online updates.

4 Using Combustion with SLES Minimal VM

SLES Minimal VM comes with the Combustion configuration tool that makes it possible to configure the system on first boot using a dedicated script file. Using Combustion instead of JeOS Firstboot allows you to automatically apply identical configuration to multiple SLES Minimal VM instances.

To trigger the Combustion tool in KVM, use the `qemu` command with the `fw_cfg` parameter that specifies the location of the `script` file.

To see how this works in practice, you can use a simple Combustion script that automatically adds the `root` user to the SLES Minimal VM instance running in QEMU.

First, generate a hash of the desired `root` password. This can be done using the `openssl passwd -6` command. Add the following instruction to the `script` file (replace the example hash with the generated one):

```
echo 'root:$5$.wn2BZHlEJ5R3B1C$TAHEchlU.h2tvf0p0ki54NaHpGYKwdNhjaBuSpDotD7' | chpasswd -e
```

Run a new virtual machine based on SLES Minimal VM in QEMU using the following command (replace `IMAGE` and `SCRIPT` with the path name of the `.qcow2` image and the `script` file):

```
> qemu-system-x86_64 \  
-enable-kvm \  
-m 1G \  
-smp 1 \  

```


```
-drive if=virtio,format=qcow2,file=IMAGE.qcow2 \  
-nographic \  
-netdev user,id=net0,hostfwd=tcp::2222-:22 \  
-device virtio-net-pci,netdev=net0 \  
-fw_cfg name=opt/org.opensuse.combustion/script,file=SCRIPT
```

Keep in mind that when Combustion is running, it does not provide any feedback or output. The only indication that the configuration has been performed correctly is the fact that the system does not launch JeOS Firstboot tool, and you can log in to the system as root using the password you generated earlier.

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