SUSE Linux Enterprise Server Minimal VM 15 SP4

Minimal VM Quick Start

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

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1 Introduction

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. 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, Minimal VM provides access to all regular software repositories.

If you already have SUSE Linux Enterprise Server certification, you are automatically certified for Minimal VM, as it is derived from the same code base. SUSE Linux Enterprise Server 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.

Minimal VM is delivered as pre-configured 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. Minimal VM ships with the SSH server enabled and excluded from the firewall configuration. The supplied KIWI templates make it possible to create customized Minimal VM images.

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 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 Minimal VM and SUSE Linux Enterprise Server

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

DIFFERENCES BETWEEN MINIMAL VM AND SUSE LINUX ENTERPRISE SERVER

jeos-firstboot

> 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, 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.
>
> Minimal VM has no channel by default, and you need to register your system to access online channels. Refer to *Book "Deployment Guide", Chapter 9 "Registering SUSE Linux Enterprise and managing modules/extensions", Section 9.3.2 "Registering with SUSEConnect"* for further information.

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

Zypper configuration

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

Minimal VM images are built using the KIWI tool. KIWI'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 configuration files used to create the official 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) ↗.

🛡️ Note: Specific host tools packages

Each SUSE Linux Enterprise Server 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, 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 Minimal VM images, systemd-coredump is disabled by default on 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 Minimal VM images are available for the x86_64 architecture only. You can download Minimal VM for the following deployment targets:

- Fully Virtual Minimal VM for KVM and Xen (FV/HVM)

- Minimal VM for VMware

- Minimal VM for Microsoft Hyper-V

- Minimal VM for OpenStack

- Paravirtual Minimal VM for Xen (PV)

❗ Important: Supported virtualization hosts (hypervisors)

Minimal VM can run as a virtualization guest on the same virtualization hosts (hypervisors) as SUSE Linux Enterprise Server. See *Book "*Virtualization Guide*", Chapter 7 "Virtualization limits and support", Section 7.3 "Supported host environments (hypervisors)"* for more information on what hypervisors are supported.

2.1 Minimal VM Image for OpenStack Cloud

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

Instead of the `jeos-firstboot` tool, 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.

Minimal VM for OpenStack Cloud includes several OpenStack-related packages, such as `cloud-init`, `cloud-init-config-suse`, and `xfsprogs`.

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./Q1i1mKR0sYicn/yAzNHP6y32JjOdVIn5agAiaEKaSaZdC3X6CVTW2d/
xslQfevCc20teWLurq12x8mbe1
    sles:$6$SalTsaLt$.cuqsgjNGxHJZSLmVqkI/
j9.kWIiUQHqjlRswbHjTw9hIXdPomgey2DHzmp6Ho6wgqIKz3ufbOIKdQCnQHPSA1
  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.kWIiUQHqjlRswbHjTw9hIXdPomgey2DHzmp6Ho6wgqIKz3ufbOIKdQCnQHPSA1
    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 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 Minimal VM image for Microsoft Hyper-V ships with `hyper-v`.

2.4 VMware flavor

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

3 Installing and running Minimal VM on KVM

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

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

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

PROCEDURE 11: CREATING A 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. In the *Choose Storage Volume* dialog, click *Add Pool*, give the new pool a name, and select *dir: Filesystem Directory* from the *Type* drop-down box. Click *Forward*.
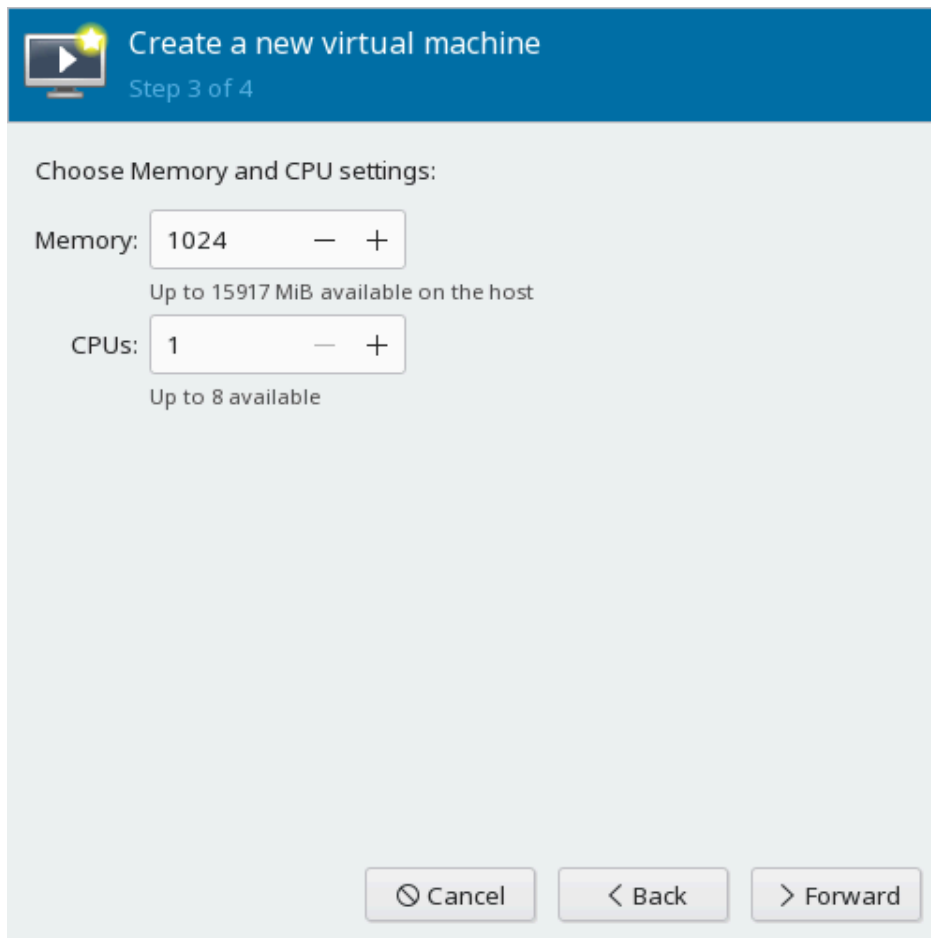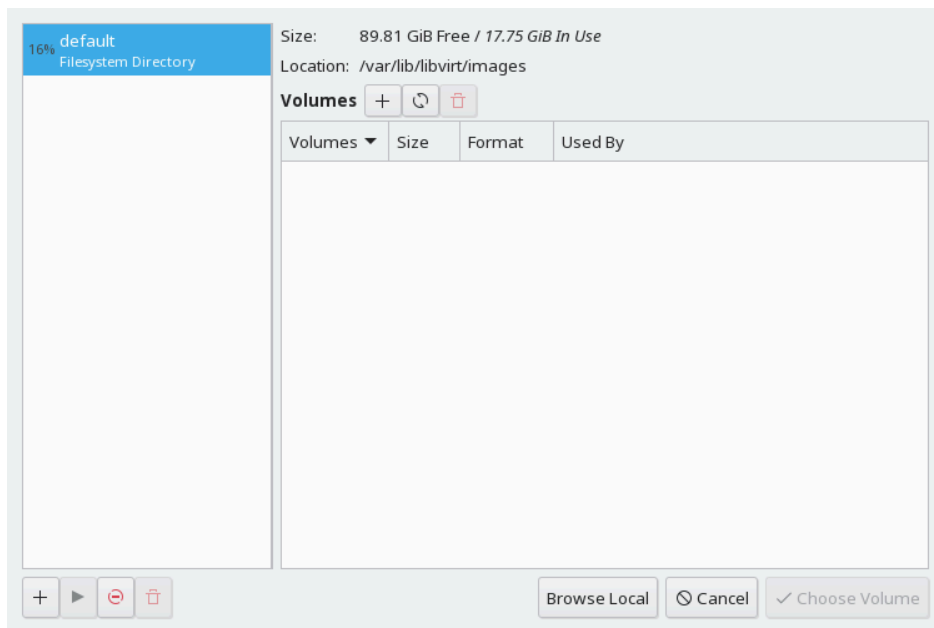
5. Click the *Browse* button next to the *Target path* field and select the directory containing the Minimal VM qcow2 image. Click *Finish*.

6. Back in the *Choose Storage Volume* dialog, select the created pool and choose the qcow2 image in the *Volumes* section. Then click *Choose Volume*.
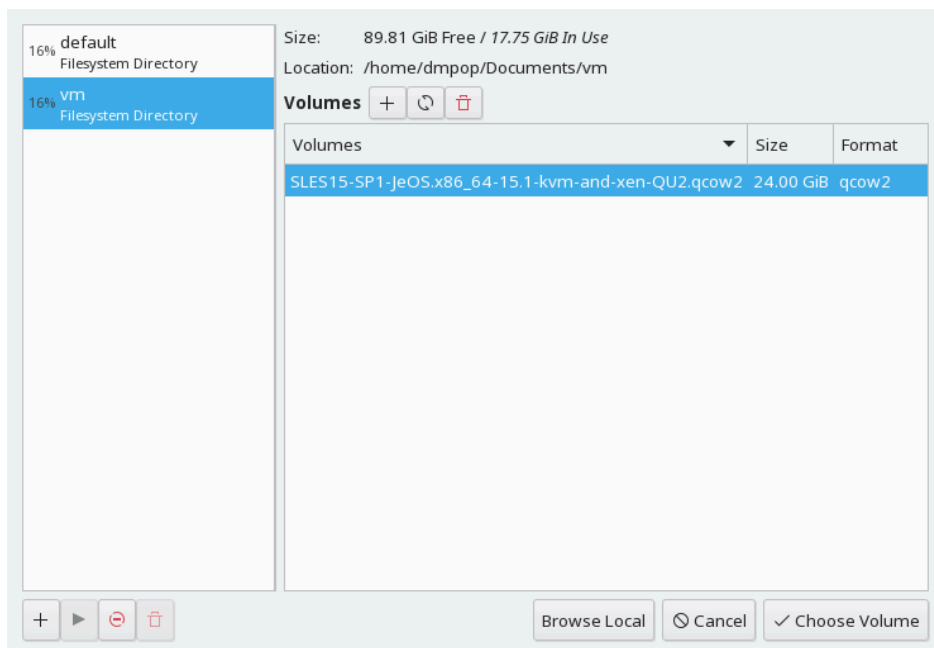
7. Back in the *Create Virtual Machine* dialog, enter `Generic` in the *Choose the operating system you are installing* field. Click *Forward*.

8. Set the RAM value to 1024, and the number of CPUs to 1. Click *Forward*.

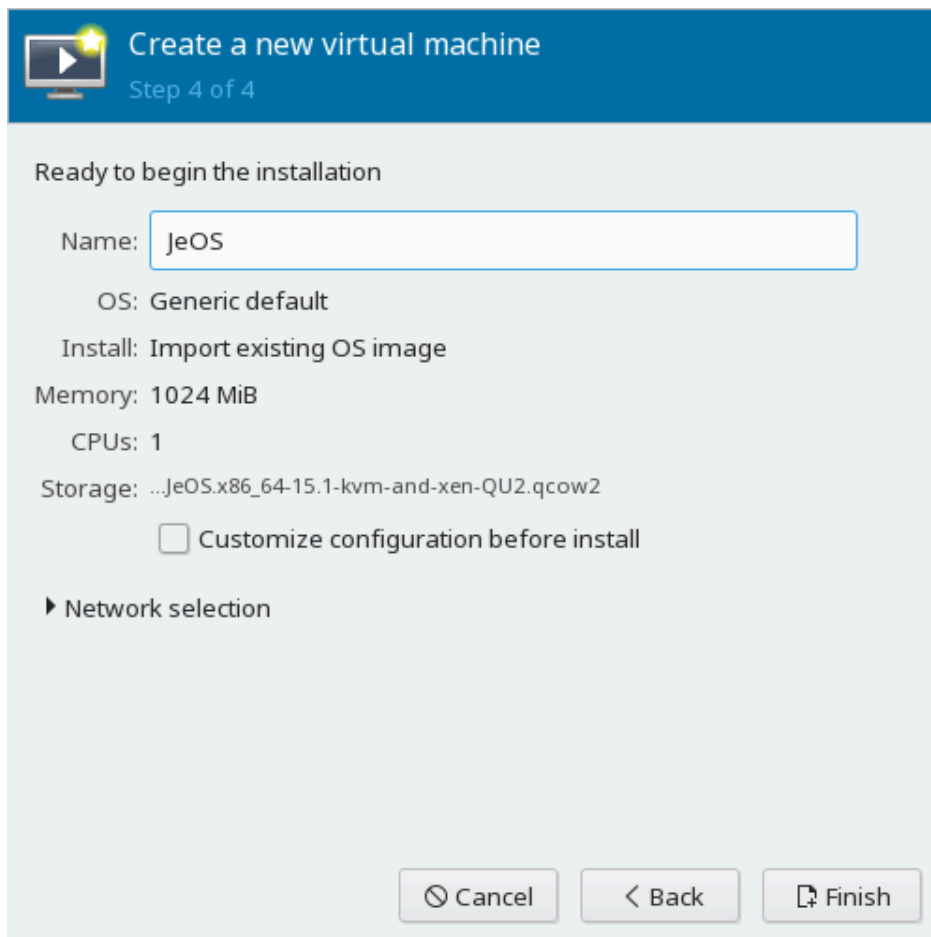9. Give the new virtual machine a name (for example, `Minimal VM`) and click *Finish*.

10. 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 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 timezone.

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