

Introduction to SLES Minimal VM

WHAT?

A high-level overview of SLES Minimal VM.

WHY?

You want to know what SLES Minimal VM can do for you.

EFFORT

10 minutes of reading time.

GOAL

Get an understanding of what SLES Minimal VM is and what it can be used for.

REQUIREMENTS

- General familiarity with SUSE Linux Enterprise Server.

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Draft

1 Introduction to SLES Minimal VM

SLES Minimal VM is a slimmed-down version of SUSE Linux Enterprise Server designed to act as a foundation for building systems for use in a data center, creating virtual application images, and building appliances. It can be customized by installing only packages required for the specific use case. This means that there are fewer packages to manage and patches to apply. The limited selection of packages also makes the system more secure by reducing the attack surface.

2 SLES Minimal VM highlights

- SLES Minimal VM is available as preconfigured and ready-to-run virtual machine images.
- While you can deploy the provided images as-is, it is also possible to create customized SLES Minimal VM images using the supplied KIWI NG templates.
- The supplied `jeos-firstboot` wizard runs on the first boot and allows you to configure basic settings, such as system locales and the `root` password. Instead of `jeos-firstboot`, SLES Minimal VM for OpenStack uses `cloud-init` for configuring OpenStack instances.
- You can establish an SSH connection to the running SLES Minimal VM instance without any further configuration.
- The default network configuration is set to use DHCP.
- The system automatically creates a Btrfs snapshot after the initial configuration has been completed. This means that you can easily revert all subsequent changes, if necessary.
- SLES Minimal VM images use the `kernel-default-base` as the default kernel, which results in a smaller footprint.
- As openSUSE Leap SLES Minimal VM and SLES Minimal VM are similar, it is easy to migrate from the former to the latter.

3 Differences between SLES Minimal VM and SUSE Linux Enterprise Server

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

JeOS Firstboot

SLES Minimal VM comes with the `JeOS Firstboot` tool (except SLES Minimal VM for OpenStack that uses `cloud-init`) that can be used to configure basic settings during the first boot. This includes keyboard layout, time zone, and `root` password.

`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.



Note

By default, the `jeos-firstboot`, `jeos-licenses` and `live-langset-data` packages do not receive updates. These packages are only required for the initial configuration of the system, and they can safely be removed or left untouched. If you prefer to keep them up-to-date, enable the Development Tools module.

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, list packages that must be included in the images. Keep in mind that packages listed in the template may pull required dependencies during the image building process. This means that the resulting image may contain more packages than those specified in the template.

Disk layout

Unlike SUSE Linux Enterprise Server, which calculates an adjustable disk layout proposal 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

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`.
- Reboot the system or use the `sysctl --system` command to enable core dumps.

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

4 Obtaining SLES Minimal VM

You can download the desired variant of SLES Minimal VM from the official [Download \(https://www.suse.com/download/sles/\)](https://www.suse.com/download/sles/) page. The page offers the following SLES Minimal VM versions:


- Fully virtual SLES Minimal VM for KVM and Xen
- SLES Minimal VM for VMware
- SLES Minimal VM for Microsoft Hyper-V
- SLES Minimal VM for OpenStack
- Paravirtual SLES Minimal VM for Xen
- Fully virtual SLES Minimal VM for KVM for AArch64



Note: SUSE subscription required

By default, SLES Minimal VM does not have any repositories. You must register your system to access online repositories. Registration requires a paid subscription.

5 Examples of using SLES Minimal VM with QEMU

You can try SLES Minimal VM by downloading a ready-made image from the official [Download](https://www.suse.com/download/sles/) (<https://www.suse.com/download/sles/>)  page. The exact procedure of creating a SLES Minimal VM-based virtual machine depends on the version you choose. Below are examples of how to create and configure a SLES Minimal VM instance with QEMU using either JeOS Firstboot or Combustion.

5.1 Running and configuring SLES Minimal VM manually using JeOS Firstboot

Run the following command to create a SLES Minimal VM virtual machine in QEMU.

```
> 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
```

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).

Keep in mind that to do this, you need to have a SUSE subscription and register the VM using the **SUSEConnect -e EMAIL -r REGISTRATION_CODE** command.

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 installing the latest available online updates.

5.2 Running and configuring SLES Minimal VM automatically using Combustion

SLES Minimal VM comes with the Combustion configuration tool that makes it possible to automatically configure the system on first boot using a dedicated script file. This can be particularly useful when you need to deploy multiple virtual machines with an identical initial configuration. To trigger the Combustion tool in QEMU, 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
```

Set up 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.



Note: Combustion documentation

For more information on using Combustion, refer to <https://documentation.suse.com/sle-micro/html/SLE-Micro-all/cha-images-combustion.html>.

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