SUSE

SUSE Linux Enterprise Micro 5.0

Installation Quick Start

SUSE Linux Enterprise Micro 5.0

This Quick Start guides you step-by-step through the installation of SUSE®
Linux Enterprise Micro 5.0.

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1 Welcome to SUSE Linux Enterprise Micro

SUSE Linux Enterprise Micro is a modern system primarily designed for edge computing. The main features of SUSE Linux Enterprise Micro are predictability and reliability thanks to the read-only root file system and transactional updates. The read-only file system ensures that the system cannot be altered during runtime and that the system behaves the same way after each reboot. Transactional updates enable you to update the system without influencing the running system and always provide a rollback.

If you want to install SUSE Linux Enterprise Micro, you can choose any of the following installation procedures:

- manual installation, see *Section 3, "The manual installation procedure"*

- unattended automatic installation by using AutoYaST, see *Section 4, "Unattended installation by using AutoYaST"*

- deployment of prebuilt images, see *Section 5, "Raw image deployment"*.

2 SUSE Linux Enterprise Micro hardware requirements

SUSE Linux Enterprise Micro has the following minimum hardware requirements:

- 1 GB RAM

- 12 GB HDD.

The recommended hard disk space is 20 GB for SLE Micro itself and 40 GB for containers data. Bear in mind that actual hardware requirements depend on the workloads of your containers.

3 The manual installation procedure

The following installation steps assume that you have successfully booted to the installation system.

3.1 The language and keyboard selection
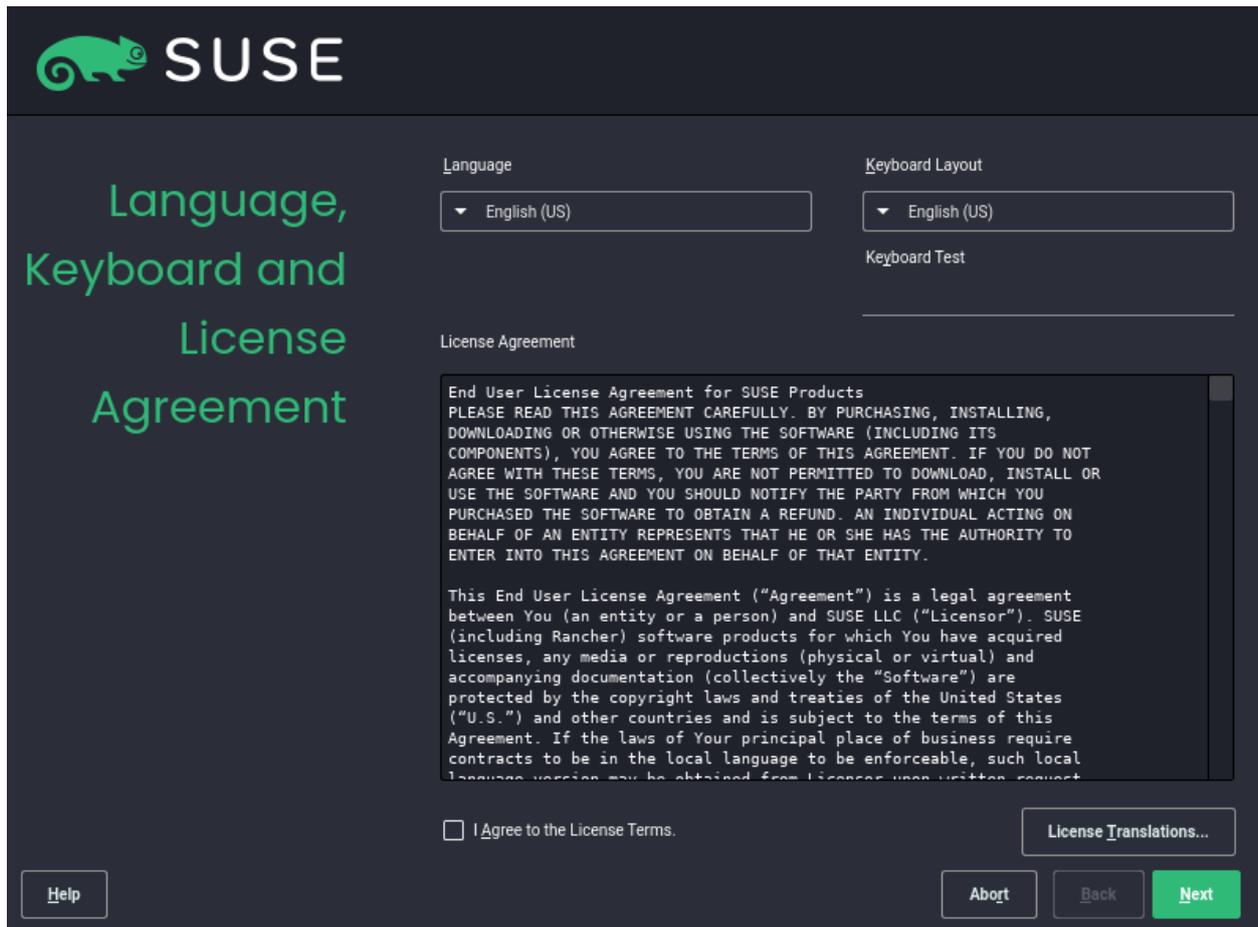
The default language and keyboard layout is English (US). You can choose a different language in the *Language* drop-down box. If necessary, select a different keyboard layout from the *Keyboard Layout* drop-down box.

Read the license agreement. The default language is English, but the licence agreement is available in multiple languages. To get a particular translation, click *License translations* and in the drop-down box select the desired language and click *OK*. After you read the license agreement, check *I Agree to the License Terms* and click *Next* to proceed to the next installation step.

3.2 Registration

In order to receive technical support and product updates, you need to register and activate your SUSE Linux Enterprise Micro with the SUSE Customer Center or a local registration server.

Register system via scc.suse.com

   To register with the SUSE Customer Center, enter the *E-mail Address* associated with your SCC account and the *Registration Code* for SUSE Linux Enterprise Micro. Proceed with *Next*.

Register system via local RMT server

   If your organization provides a local registration server, you may alternatively register there. Activate *Register System via local RMT Server* and either choose a URL from the drop-down box or type in an address. Proceed with *Next*.

Skip registration

   If you want to skip registration, click *Skip Registration*. Accept the warning with *OK* and proceed with *Next*.

! Important: Skipping registration

Your system needs to be registered in order to retrieve updates and to be eligible for support. You can register later, after the installation.
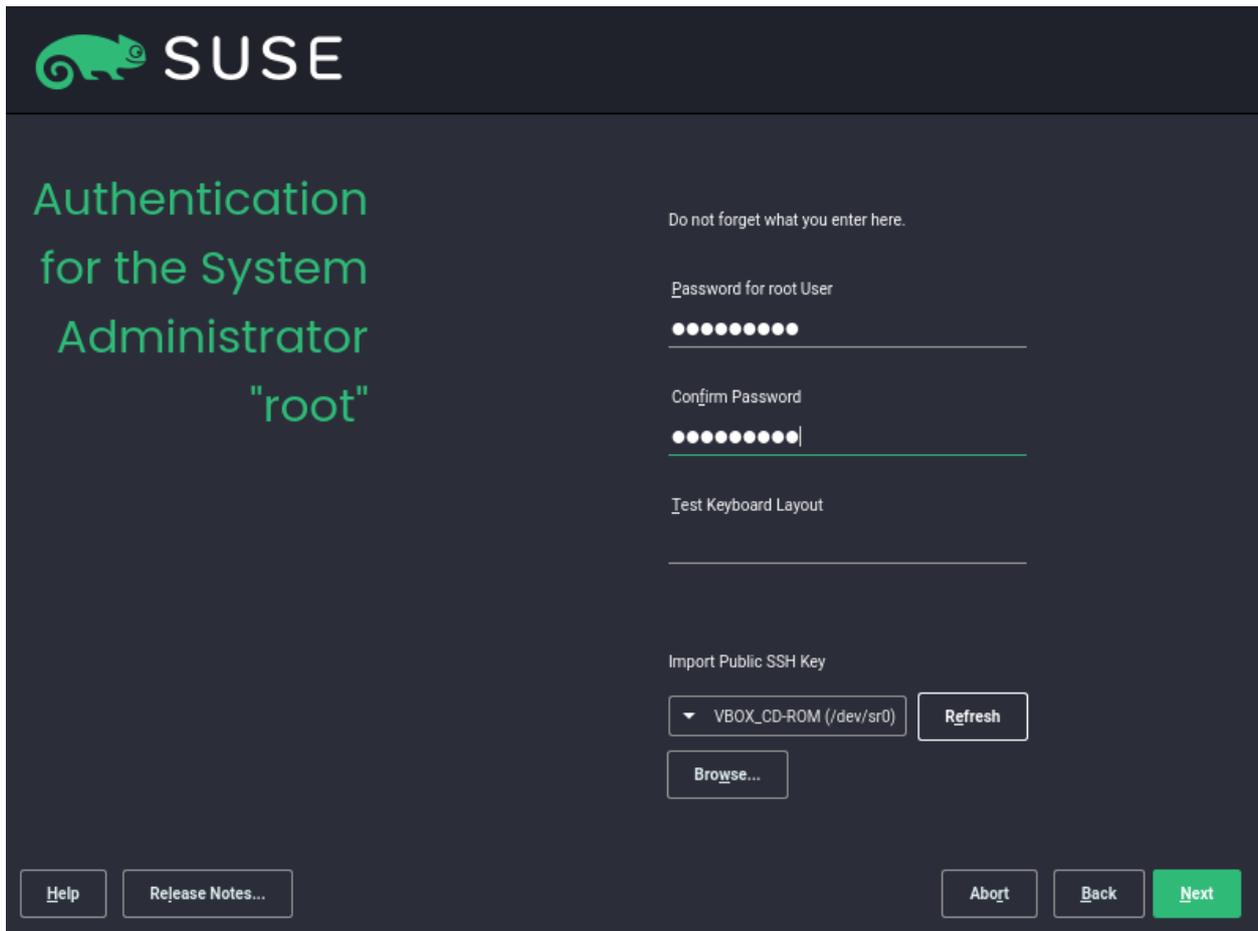
After completing registration, click *Next*.

3.3   NTP servers configuration
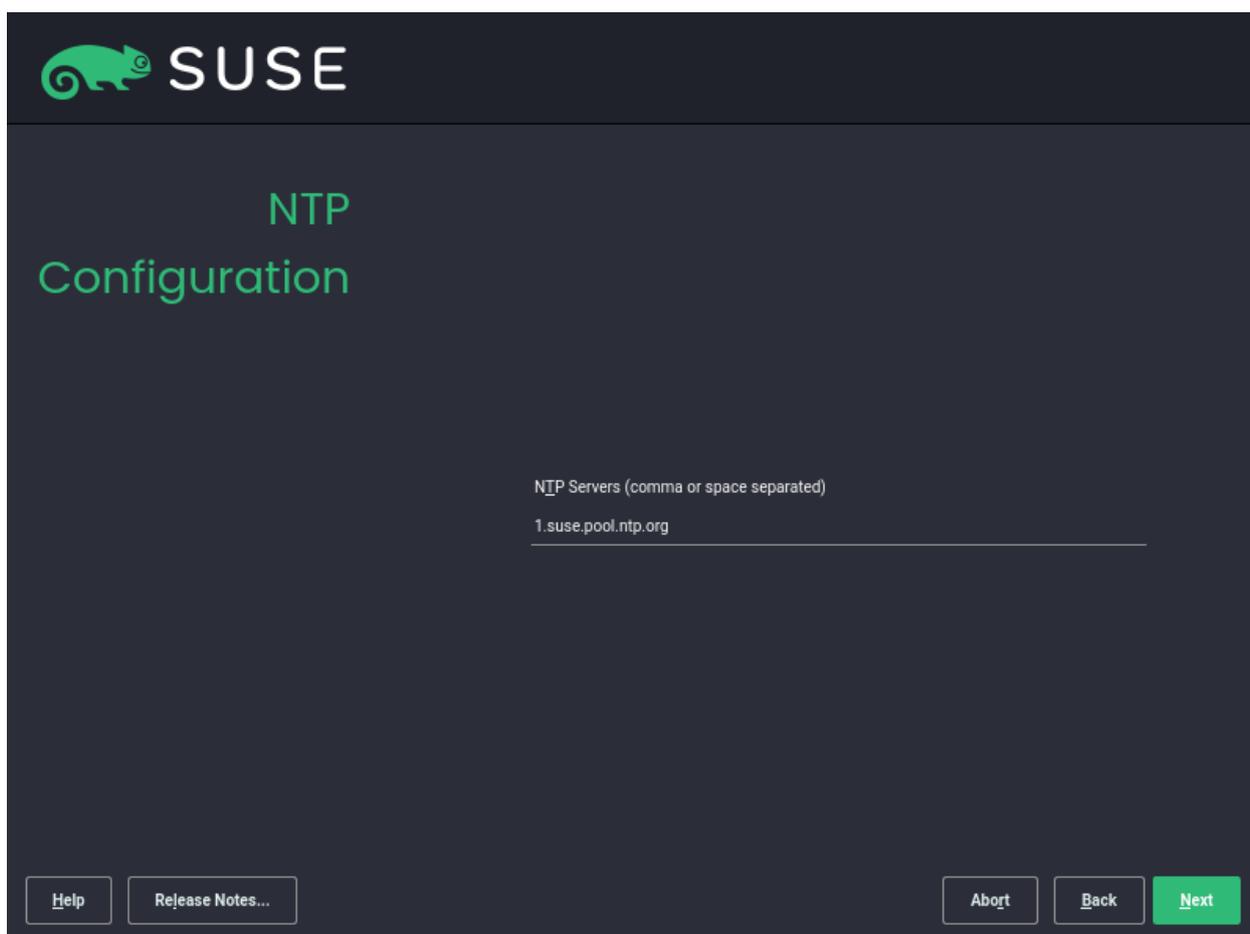
In order to keep time on your system properly synchronized, configure at least one NTP server.

3.4 Authentication for `root`

Configure a strong password for `root` with at least 5 characters—a combination of uppercase and lowercase letters and numbers. The maximum length for passwords is 72 characters, and passwords are case-sensitive.

You can import an already existing SSH key by clicking *Browse* and selecting the public SSH key.

Click *Next* to proceed to the next installation step.

3.5   Installation settings
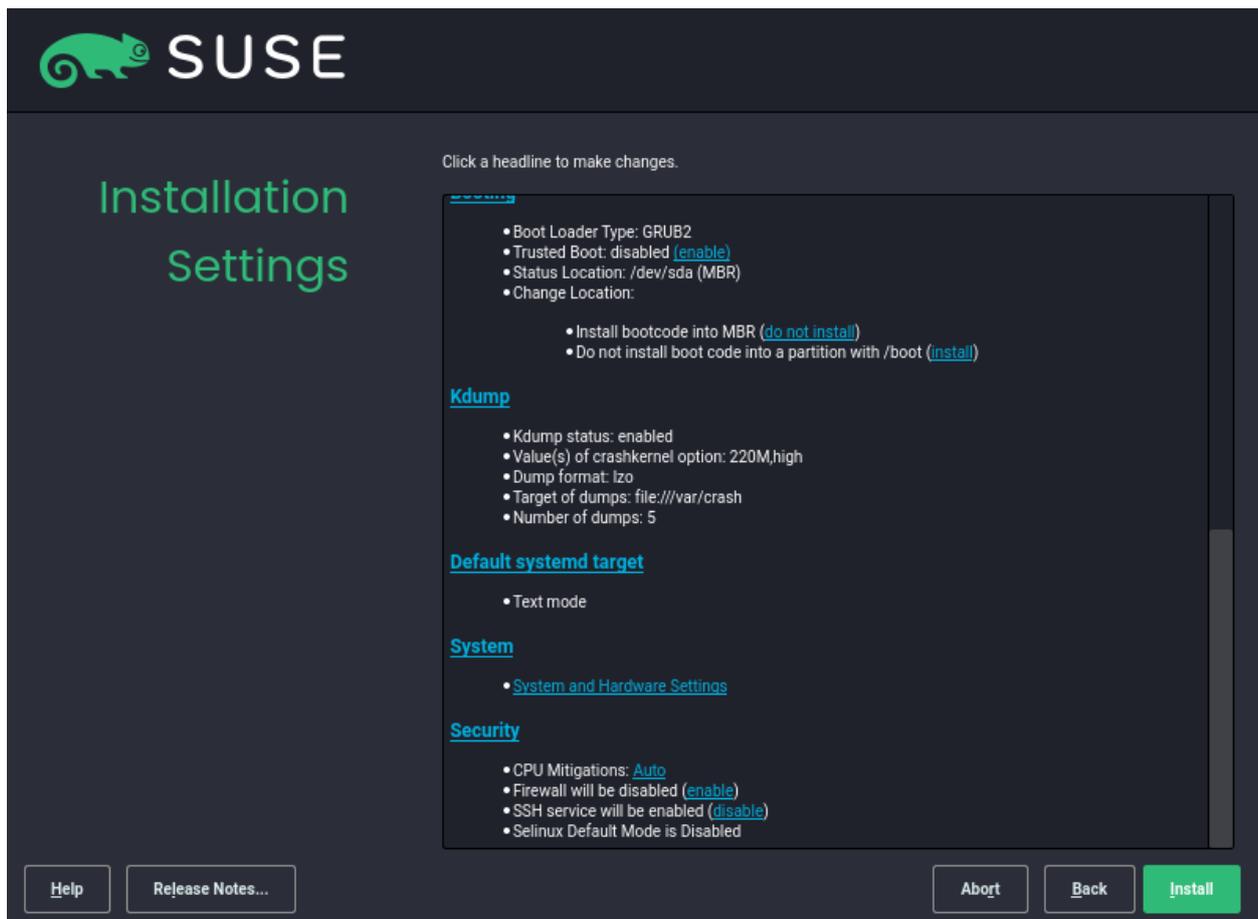
The last installation step provides a summary of installation setting. Review the settings and—
if necessary—perform changes. To change a setting, click the button behind the option or click
the setting headline for more options.

Partitioning

To modify partitions, you can use the *Expert partitioner*. To encrypt your disk or to enable
logical volume management, click *Guided Setup* and then fill in a password for the disk
decryption.

Software

Clicking *Software* opens the *Software Selection and System Tasks* screen, where you can
change the software selection by selecting or deselecting patterns. Each pattern contains
several software packages needed for specific functions. To view and manage these
packages, click *Details*.

Time Zone

> By default, the time is synchronized by using the NTP servers you provided in the previous steps of the installation procedure, but you can select the region and time zone. If you want to set the time and date manually, click the *Other settings* button and select *Manually*.

Network Configuration

> Displays the current network configuration. Click *Network Configuration* to change the settings.

Booting

> This section shows the boot loader configuration. Changing the defaults is only recommended if really needed.

Kdump

> Kdump saves the memory image ("core dump") to the file system in case the kernel crashes. This enables you to find the cause of the crash by debugging the dump file. Kdump is preconfigured and enabled by default.

Default systemd target

> Only the text mode is available.

System

> View detailed hardware information by clicking *System*. In the resulting screen you can also change *Kernel Settings*.

Security

> The *CPU Mitigations* refer to kernel boot command line parameters for software mitigations that have been deployed to prevent CPU side-channel attacks. Click the highlighted entry to choose a different option.
>
> By default, the firewall is disabled. Click *enable* to change the default.
>
> The SSH service is enabled by default. Click *disable* to change the setting. Bear in mind that if you disable the SSH service, you will not be able to login to your system remotely. The SSH port (22) is open by default.
>
> The default SELinux option is *disabled*. You can change the value by clicking *Security* and selecting another option in the *Mode* menu.

If you reviewed the installation settings, you can proceed to installation by clicking *Install* and then confirming the installation.

4 Unattended installation by using AutoYaST

SUSE Linux Enterprise Micro can be installed by using AutoYaST. You need to manually create an XML control file also called profile. AutoYaST then installs SLE Micro according to the instructions in the profile. For details, refer to *Book "AutoYaST Guide"*.

> **! Important**
>
> Some of the resources and properties in the AutoYaST profile are by default applied in the second stage of the unattended installation, but the second stage is not available for SUSE Linux Enterprise Micro. Thus in order to apply all resources and properties, you need to disable the second stage in the AutoYaST profile:
>
> ```
> <second_stage config:type="boolean">false</second_stage>
> ```
>
> AutoYaST then applies all resources and properties in the first stage regardless of whether they are by default applied in the second stage.

5 Raw image deployment

SUSE Linux Enterprise Micro provides raw images that can be directly deployed to your device storage—a memory card, USB flash drive, or a hard disk. The options for which type of device you can deploy the image to depend on your particular hardware—follow your vendor documentation.

To initially configure the deployed image, you need to prepare the configuration data as described in *Procedure 2, "Preparing the configuration device."* and you need to copy the configuration data to a device (e.g. USB disk). The device needs to be connected to your host running SLE Micro during its first boot. You can prepare the setup for deployment as described in the following procedure:

PROCEDURE 1: PREPARING THE RAW DISK IMAGE

1. Download the raw image and decompress it:

   ```
   tux > xz -d <downloaded_image.raw.xz>
   ```

2. Copy the decompressed image to the device where SLE Micro will run:

   ```
   tux > dd if=<downloaded_image.raw> of=/dev/sdX
   ```

The following procedure describes how to prepare the configuration device (usually a USB flash disk).

1. Format the disk to any file system supported by SLE Micro: FAT, Ext4, etc.:

   ```
   tux > sudo mkfs.ext4 /dev/sdY
   ```

2. Set the device label to either `ignition` or `combustion`. For the Ext4 file system:

   ```
   tux > sudo e2label /dev/sdY ignition
   ```

   You can use any type of configuration storage media that your virtualization system or your hardware supports—ISO image, a USB flash disk, etc.

3. Mount the device:

   ```
   tux > sudo mount /dev/sdY /mnt
   ```

4. Create the directory structure as mentioned in *Section 5.1, "Configuration by using Ignition"* or *Section 5.2, "Configuration by using Combustion"*, depending on the configuration tool used:

   ```
   tux > sudo mkdir -p /mnt/ignition/
   ```

   or:

   ```
   tux > sudo mkdir -p /mnt/combustion/
   ```

5. Prior to booting for the first time, prepare all elements of the configuration that will be used by *Ignition* or *Combustion*. The minimal configuration must provide a password for `root`, otherwise the system will not be accessible after the first boot.

After the first boot, you need to register your SUSE Linux Enterprise Micro instance by using the command line tool **SUSEConnect**. For details, refer to *Section 5.3, "Registering with SUSEConnect"*.

5.1 Configuration by using Ignition

Ignition configures your system on the first boot according to the `config.ign` configuration file. The `config.ign` file must be placed in a directory named `ignition`. The `ignition` directory is a subdirectory of the root directory. The root directory also contains the raw image to be deployed. The directory structure is then the following:

```
<root directory>
 - ignition
  - config.ign
```

> ◈ **Note: Using Ignition on a QEMU virtual machine**
>
> Ignition can be used to configure your QEMU virtual machine on the first boot. To configure your virtual machine by using Ignition, use the QEMU commnad line attribute `fw_cfg` to pass the location of the `config.ign` to your virtual machine.
>
> ```
> -fw_cfg name=opt/com.coreos/config,file=<path to config.ign>
> ```

The `config.ign` is in JSON format. A minimal example follows:

```
{
  "ignition": { "version": "3.1.0" },
  "passwd": {
    "users": [
      {
        "name": "root",
        "passwordHash": "O9h4s2UUtAtok"
      }
    ]
  }
}
```

The example above sets a password for `root` to *password*. To obtain your own password hash, use the command:

```
root #  openssl passwd
```

5.2 Configuration by using Combustion

Combustion is a minimal module for dracut. You can provide your script and Combustion runs the script on the first boot of the system. You can use Combustion to add files, install packages, set up devices, and repartition your disk. You can provide the configuration as a shell script on external storage. The script is executed during the boot process in a transactional update shell. If the process is successful, the system boots into the new snapshot.

To use Combustion on boot, create a directory named `combustion` as a subdirectory of the root directory. In the `combustion` directory, place a file named `script` and any other necessary files. The directory structure looks as follows:

```
    <root directory>
 - combustion
  - script
  - other files
```

> ### Note: Using Combustion on a QEMU virtual machine
>
> Combustion searches for the `script` in `opt/org.opensuse.combustion/script`. If the `script` is present, Combustion creates the `combustion` directory on the device and copies the `script` to the directory.
>
> To pass the `script` to your virtual machine, use the following QEMU `fw cfg` parameter:
>
> ```
>     -fw_cfg name=opt/org.opensuse.combustion/script,file=/var/combustion-script
> ```

You can use Combustion together with Ignition. In this case, label your device `ignition`, create also the `ignition` subdirectory of the root directory, and place the `config.ign` into the `ignition` directory. The directory structure then looks as follows:

```
<root directory>
 -combustion
  - script
  - other files
 - ignition
  - config.ign
```

The following example of `script` sets a `root` password, copies an SSH key (the SSH key must be located in the `combustion` directory), and installs the *Vim* editor with reduced features.

```
#!/bin/bash
# combustion: network
```

```
# Redirect output to the console
exec > >(exec tee -a /dev/tty0) 2>&1
# Set a password for root, generate the hash with "openssl passwd -6"
echo 'root:$5$.wn2BZHlEJ5R3B1C$TAHEchlU.h2tvfOpOki54NaHpGYKwdNhjaBuSpDotD7' | chpasswd -e
# Add a public ssh key and enable sshd
mkdir -pm700 /root/.ssh/
cat id_rsa_new.pub >> /root/.ssh/authorized_keys
systemctl enable sshd.service
# Install vim-small
zypper --non-interactive install vim-small
# Leave a marker
echo "Configured with combustion" > /etc/issue.d/combustion
```

> **Note**
>
> The statement `# combustion: network` informs Combustion that the network must be configured before the script is executed. Combustion uses the `initrd` network configuration—DHCP is used by default.

5.3   Registering with SUSEConnect

Registering the system is possible from the command line using **SUSEConnect**. For information that goes beyond the scope of this section, refer to the inline documentation with **SUSEConnect --help**

PROCEDURE 3: **PRODUCT REGISTRATION WITH SUSECONNECT**

1. To register SUSE Linux Enterprise Micro with SUSE Customer Center, run **SUSEConnect** as follows:

   ```
   tux > sudo SUSEConnect -r REGISTRATION_CODE -e EMAIL_ADDRESS
   ```

   To register with a local registration server, additionally provide the URL to the server:

   ```
   tux > sudo SUSEConnect -r REGISTRATION_CODE -e EMAIL_ADDRESS \
   --url "https://suse_register.example.com/"
   ```

   Replace *REGISTRATION_CODE* with the registration code you received with your copy of SUSE Linux Enterprise Micro. Replace *EMAIL_ADDRESS* with the e-mail address associated with the SUSE account you or your organization uses to manage subscriptions.

2. SUSE Linux Enterprise Micro is now registered.

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