Deploying SLE Micro Using an ISO image on Bare Metal

WHAT?

SUSE Linux Enterprise Micro provides selfinstall images (also referred to as pre-built images) that can be deployed directly to your device storage: a memory card, a USB flash disk or a hard disk. The type of device you can deploy the image to is determined by your specific hardware. Refer to your vendor's documentation for guidance.

WHY?

You need to know how to deploy SLE Micro on your system.

EFFORT

It takes approximately 20 minutes to read the article.

GOAL

SLE Micro is successfully deployed on your system.

REQUIREMENTS

- Understanding for which environment the selfinstall disk image is suited. For details, refer to the Introduction to SLE Micro article.
- A device where you deploy the raw image and where SLE Micro will run.
- Optionally, a configuration medium, for example, a USB flash disk.

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Contents

1 About pre-built images

Pre-built images are ready-to-use representations of a running operating system. They are not installed in a traditional way using an installer, but copied to the hard disk of the target host. The topic covers basic information about these pre-built images.

The pre-built images are intended to be configured on the first boot by using tools delivered in the images. The boot loader detects the first boot as described in *Section 1.2, "First boot detection"*. Each image comes with default mounted subvolumes, which may be changed during the first boot configuration. For details about the subvolumes, refer to *Section 1.1, "Default partitioning"*.

1.1 Default partitioning

The pre-built images are delivered with a default partitioning scheme. You can change it during the first boot by using *Ignition* or *Combustion*.

Important: Btrfs is mandatory for the root file system

If you intend to perform any changes to the default partitioning scheme, the root file system must be Btrfs.

Each image has the following subvolumes:

```
/home
/root
/opt
/srv
/usr/local
/var
```

The `/etc` directory is mounted as overlayFS, where the upper directory is mounted to `/var/lib/overlay/1/etc/`.

You can recognize the subvolumes mounted by default by the option `x-initrd.mount` in `/etc/fstab`. Other subvolumes or partitions must be configured either by Ignition or Combustion.

1.2 First boot detection

The deployment configuration runs on the first boot only. To distinguish between the first and subsequent boots, the flag file `/boot/writable/firstboot_happened` is created after the first boot finishes. If the file is not present in the file system, the attribute `ignition.firstboot` is passed to the kernel command line and thus both Ignition and Combustion are triggered to run (in the initrd). After completing the first boot, the `/boot/writable/firstboot_happened` flag file is created.

Note: The flag file is always created

Even though the configuration may not be successful because of improper or missing configuration files, the `/boot/writable/firstboot_happened` flag file is created.

1.2.1 Force system reconfiguration on a subsequent boot

If you need to reconfigure your system after the first boot happened, you can force the reconfiguration on the subsequent boot. Here you have two options.

- You can pass the `ignition.firstboot=1` attribute to the kernel command line.
- You can delete the flag file `/boot/writable/firstboot_happened`.

2 Preparing the configuration device

During the installation process, you can pass a complex configuration to define users, directories, or to provide SSH keys. To do so, create a configuration device that is later processed by either Ignition or Combustion.

Important: SSH login

By default, `root` SSH login in SLE Micro is permitted only by using the SSH key. We recommend creating an unprivileged user during the deployment process that you can use to access the installed system. You can create an unprivileged user account on the first boot by using either the Combustion or Ignition tool. Creating an unprivileged user during system deployment is useful for accessing the Cockpit Web interface as well.

To prepare the configuration device, proceed as follows:

PROCEDURE 1: PREPARING THE CONFIGURATION DEVICE

1. Format the disk to any file system supported by SLE Micro: Ext3, Ext4, etc.:

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

2. Set the device label to either `ignition` (when either Ignition or Combustion is used) or `combustion` (when only Combustion is used). If needed (for example, on Windows host), use uppercase letters for the labels. To label the device, run:

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

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

3. Mount the device:

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

4. Create the directory structure as mentioned in *Section 2.1.1.1, “ `config.ign` ”* or *Section 2.2.1.1, “The `script` file”*, depending on the configuration tool used:

```
> sudo mkdir  /mnt/ignition/
```

   or:

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

5. Prepare all elements of the configuration that will be used by *Ignition* or *Combustion*.

2.1 Configuring SLE Micro deployment with Ignition

Ignition (https://coreos.github.io/ignition/) is a provisioning tool that enables you to configure a system according to your specification on the first boot.

2.1.1 How does Ignition work?

When the system is booted for the first time, Ignition is loaded as part of an `initramfs` and searches for a configuration file within a specific directory (on a USB flash disk, or you can provide a URL). All changes are performed before the kernel switches from the temporary file system to the real root file system (before the `switch_root` command is issued).

Ignition uses a configuration file in the JSON format named `config.ign`. You can either write the configuration manually or use the Fuel Ignition Web application at https://ignite.opensuse.org to generate it.

Important

Fuel Ignition does not cover the complete Ignition vocabulary yet, and the resulting JSON file may need additional manual tweaking.

Tip

If you decide to write the Ignition configuration manually and prefer the YAML format over JSON, you can create a YAML file and convert this file to JSON using a `Butane` tool. For details, refer to *Section 2.1.2.2, "Converting YAML formatted files into JSON"*.

2.1.1.1 `config.ign`

The configuration file `config.ign` must reside in the `ignition` subdirectory on the configuration media, for example, a USB stick labeled `ignition`. The directory structure must look as follows:

```
<root directory>
└── ignition
    └── config.ign
```

Tip

To create a disk image with the Ignition configuration, you can use the Fuel Ignition Web application at https://ignite.opensuse.org.

When configuring a virtual machine with Virtual Machine Manager (`libvirt`), provide the path to the `config.ign` file in its XML definition, for example:

```
<domain ... >
  <sysinfo type="fwcfg">
    <entry name="opt/com.coreos/config" file="/location/to/config.ign"/>
  </sysinfo>
</domain>
```

The `config.ign` contains multiple data types: objects, strings, integers, booleans and lists of objects. For a complete specification, refer to Ignition specification v3.3.0 (https://coreos.github.io/ignition/configuration-v3_3/).

The `version` attribute is mandatory and in case of SLE Micro, its value must be set either to `3.3.0` or to any lower version. Otherwise, Ignition will fail.

To log in to your system as `root`, you must at least include a password for `root`. However, it is recommended to establish access via SSH keys. To configure a password, make sure to use a secure one. If you use a randomly generated password, use at least 10 characters. If you create your password manually, use even more than 10 characters and combine uppercase and lowercase letters and numbers.

2.1.2 Ignition configuration examples

2.1.2.1 Configuration examples

This section provides several examples of the Ignition configuration in both the built-in JSON format and the YAML format as well. Ignition does not accept configuration in the YAML format, and you need to convert it to the JSON format. To do so, you can use the `butane` tool as described in *Section 2.1.2.2, "Converting YAML formatted files into JSON"*.

Important

Section 1.1, "Default partitioning" lists subvolumes that are mounted by default when running the pre-built image. If you want to add a new user or modify any of the files on a subvolume that is not mounted by default, you need to declare such subvolume first so that it is mounted as well. Find more details about mounting file systems in *Section 2.1.2.1.1.3, "The `filesystems` attribute"*.

Note: The `version` attribute is mandatory

Each `config.fcc` must include version 1.4.0 or lower that is then converted to the corresponding Ignition specification.

2.1.2.1.1 Storage configuration

The `storage` attribute is used to configure partitions, RAID, define file systems, create files, etc. To define partitions, use the `disks` attribute. The `filesystems` attribute is used to format partitions and define mount points of particular partitions. The `files` attribute can be used to create files in the file system. Each of the mentioned attributes is described in the following sections.

2.1.2.1.1.1 The `disks` attribute

The `disks` attribute is a list of devices that enables you to define partitions on these devices. The `disks` attribute must contain at least one `device`, other attributes are optional. The following example uses a single virtual device and divides the disk into four partitions:

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "storage": {
    "disks": [
      {
        "device": "/dev/vda",
        "partitions": [
          {
            "label": "root",
            "number": 1,
            "typeGuid": "4F68BCE3-E8CD-4DB1-96E7-FBCAF984B709"
          },
          {
            "label": "boot",
            "number": 2,
            "typeGuid": "BC13C2FF-59E6-4262-A352-B275FD6F7172"
          },
          {
            "label": "swap",
```

```
            "number": 3,
            "typeGuid": "0657FD6D-A4AB-43C4-84E5-0933C84B4F4F"
          },
          {
            "label": "home",
            "number": 4,
            "typeGuid": "933AC7E1-2EB4-4F13-B844-0E14E2AEF915"
          }
        ],
        "wipeTable": true
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
storage:
  disks:
    - device: "/dev/vda"
      wipe_table: true
      partitions:
       - label: root
         number: 1
         type_guid: 4F68BCE3-E8CD-4DB1-96E7-FBCAF984B709
       - label: boot
         number: 2
         type_guid: BC13C2FF-59E6-4262-A352-B275FD6F7172
       - label: swap
         number: 3
         type_guid: 0657FD6D-A4AB-43C4-84E5-0933C84B4F4F
       - label: home
         number: 4
         type_guid: 933AC7E1-2EB4-4F13-B844-0E14E2AEF915
```

2.1.2.1.1.2 The `raid` attribute

The `raid` is a list of RAID arrays. The following attributes of `raid` are mandatory:

level

a level of the particular RAID array (linear, raid0, raid1, raid2, raid3, raid4, raid5, raid6)

devices

a list of devices in the array referenced by their absolute paths

name

a name that will be used for the md device

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "storage": {
    "raid": [
      {
        "devices": [
          "/dev/sda",
          "/dev/sdb"
        ],
        "level": "raid1",
        "name": "system"
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
storage:
  raid:
    - name: system
      level: raid1
      devices:
        - "/dev/sda"
        - "/dev/sdb"
```

2.1.2.1.1.3 The `filesystems` attribute

`filesystems` must contain the following attributes:

device

the absolute path to the device, typically `/dev/sda` in case of physical disk

format

the file system format (Btrfs, Ext4, xfs, vfat or swap)

Note

In case of SLE Micro, the `root` file system must be formatted to Btrfs.

The following example demonstrates using the `filesystems` attribute. The `/opt` directory will be mounted to the `/dev/sda1` partition, which is formatted to Btrfs. The device will not be erased.

JSON

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "storage": {
    "filesystems": [
      {
        "device": "/dev/sda1",
        "format": "btrfs",
        "path": "/opt",
        "wipeFilesystem": false
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
storage:
  filesystems:
    - path: /opt
      device: "/dev/sda1"
      format: btrfs
      wipe_filesystem: false
```

Normally, a regular user's home directory is located in the `/home/USER_NAME` directory. Since `/home` is not mounted by default in the initrd, the mount has to be explicitly defined for the user creation to succeed:

JSON:

```
{
  "ignition": {
```

```
    "version": "3.1.0"
  },
  "passwd": {
    "users": [
      {
        "name": "root",
        "passwordHash": "PASSWORD_HASH",
        "sshAuthorizedKeys": [
          "ssh-rsa SSH_KEY_HASH"
        ]
      }
    ]
  },
  "storage": {
    "filesystems": [
      {
        "device": "/dev/sda3",
        "format": "btrfs",
        "mountOptions": [
          "subvol=/@/home"
        ],
        "path": "/home",
        "wipeFilesystem": false
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.1.0
storage:
  filesystems:
    - path: /home
      device: /dev/sda3
      format: btrfs
      wipe_filesystem: false
      mount_options:
       - "subvol=/@/home"
passwd:
  users:
   - name: root
     password_hash: PASSWORD_HASH
     ssh_authorized_keys:
       - ssh-rsa SSH_KEY_HASH
```

2.1.2.1.1.4 The `files` attribute

You can use the `files` attribute to create any files on your machine. Bear in mind that to create files outside the default partitioning schema, you need to define the directories by using the `filesystems` attribute.

In the following example, a host name is created by using the `files` attribute. The file `/etc/hostname` will be created with the *alp-1* host name:

Important

The file mode specification is different for JSON and YAML. While JSON accepts file modes in decimal numbers, for example, `420`, YAML accepts octal numbers (`0644`).

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "storage": {
    "files": [
      {
        "overwrite": true,
        "path": "/etc/hostname",
        "contents": {
          "source": "data:,alp-1"
        },
        "mode": 420
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
storage:
  files:
    - path: /etc/hostname
      mode: 0644
      overwrite: true
      contents:
```

```
        inline: "alp-1"
```

2.1.2.1.1.5 The `directories` attribute

The `directories` attribute is a list of directories that will be created in the file system. The `directories` attribute must contain at least one `path` attribute.

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "storage": {
    "directories": [
      {
        "path": "/home/tux",
        "user": {
          "name": "tux"
        }
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
storage:
  directories:
    - path: /home/tux
      user:
        name: tux
```

2.1.2.1.2 Users administration

The `passwd` attribute is used to add users. If you intend to log in to your system, create `root` and set the `root`'s password and/or add the SSH key to the Ignition configuration. You need to hash the `root` password, for example, by using the **`openssl`** command:

```
 openssl passwd -6
```

The command creates a hash of the password you chose. Use this hash as the value of the `password_hash` attribute.

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "passwd": {
    "users": [
      {
        "name": "root",
        "passwordHash": "PASSWORD_HASH",
        "sshAuthorizedKeys": [
          "ssh-rsa SSH_KEY_HASH USER@HOST"
        ]
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
passwd:
  users:
   - name: root
     password_hash: "PASSWORD_HASH"
     ssh_authorized_keys:
       - ssh-rsa SSH_KEY_HASH USER@HOST
```

The `users` attribute must contain at least one `name` attribute. `ssh_authorized_keys` is a list of ssh keys for the user.

2.1.2.1.3 Enabling `systemd` services

You can enable `systemd` services by specifying them in the `systemd` attribute.

JSON:

```
{
  "ignition": {
    "version": "3.0.0"
  },
  "systemd": {
    "units": [
      {
```

```
        "enabled": true,
        "name": "sshd.service"
      }
    ]
  }
}
```

YAML:

```
variant: fcos
version: 1.0.0
systemd:
  units:
  - name: sshd.service
    enabled: true
```

The `name` must be the exact name of a service to be enabled (including the suffix).

2.1.2.2 Converting YAML formatted files into JSON

JSON is a universal file format for storing structured data. Applications, for example, Ignition, use it to store and retrieve their configuration. Because JSON's syntax is complex and hard to read for human beings, you can write the configuration in a more friendly format called YAML and then convert it into JSON.

2.1.2.2.1 Converting YAML files into JSON format

The tool that converts Ignition-specific vocabularies in YAML files into JSON format is `butane`. It also verifies the syntax of the YAML file to catch potential errors in the structure. For the latest version of `butane`, add the following repository:

```
> sudo  zypper ar -f \
  https://download.opensuse.org/repositories/devel:/kubic:/ignition/openSUSE_Tumbleweed/
 \
  devel_kubic_ignition
```

Replace `openSUSE_Tumbleweed` with one of the following (depending on your distribution):

- `'openSUSE_Leap_$releasever'`
- `15.5`

Now you can install the `butane` tool:

```
> sudo  zypper ref && zypper in butane
```

After the installation is complete, you can invoke `butane` by running:

```
>  butane -p -o config.ign config.fcc
```

- `config.fcc` is the path to the YAML configuration file.
- `config.ign` is the path to the output JSON configuration file.
- The `-p` command option adds line breaks to the output file and thus makes it more readable.

2.2 Configuring SLE Micro deployment with Combustion

Combustion is a dracut module that enables you to configure your system on the first boot. You can use Combustion, for example, to change the default partitions, set user passwords, create files, or install packages.

2.2.1 How does Combustion work?

Combustion is invoked after the `ignition.firstboot` argument is passed to the kernel command line. Combustion reads a provided file named `script`, executes included commands, and thus performs changes to the file system. If `script` includes the network flag, Combustion tries to configure the network. After `/sysroot` is mounted, Combustion tries to activate all mount points in `/etc/fstab` and then calls **`transactional-update`** to apply other changes, for example, setting `root` password or installing packages.

2.2.1.1 The `script` file

The configuration file `script` must reside in the `combustion` subdirectory on the configuration media labeled `combustion`. The directory structure must look as follows:

```
<root directory>
└── combustion
    └── script
    └── other files
```

When configuring a virtual machine with Virtual Machine Manager (`libvirt`), provide the path to the `script` file in its XML definition, for example:

```
<domain ... >
  <sysinfo type="fwcfg">
    <entry name="opt/org.opensuse.combustion/script" file="/location/to/script"/>
  </sysinfo>
</domain>
```

Tip: Using Combustion together with Ignition

Combustion can be used along with Ignition. If you intend to do so, label your configuration medium `ignition` and include the `ignition` directory with the `config.ign` to your directory structure as shown below:

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

In this scenario, Ignition runs before Combustion.

2.2.2 Combustion configuration examples

2.2.2.1 The `script` configuration file

The `script` configuration file is a set of commands that are parsed and executed by Combustion in a **`transactional-update`** shell. This article provides examples of configuration tasks performed by Combustion.

Important: Include interpreter declaration

As the `script` file is interpreted by the shell, always start the file with the interpreter declaration on its first line. For example, in case of Bash:

```
#!/bin/bash
```

To log in to your system, include at least the `root` password. However, it is recommended to establish the authentication using SSH keys. If you need to use a `root` password, make sure to configure a secure password. For a randomly generated password, use at least 10 characters. If you create your password manually, use even more than 10 characters and combine uppercase and lowercase letters and numbers.

2.2.2.1.1 Network configuration

To configure and use the network connection during the first boot, add the following statement to `script`:

```
# combustion: network
```

Using this statement passes the `rd.neednet=1` argument to dracut. The network configuration defaults to using DHCP. If a different network configuration is needed, proceed as described in *Section 2.2.2.1.2, "Performing modifications in the initramfs"*.

If you do not use the statement, the system remains configured without any network connection.

2.2.2.1.2 Performing modifications in the initramfs

You may need to perform changes to the initramfs environment, for example, to write a custom network configuration for NetworkManager into `/etc/NetworkManager/system-connections/`. To do so, use the `prepare` statement.

For example, to create a connection with a static IP address and configure DNS:

```
#!/bin/bash
# combustion: network prepare
set -euxo pipefail

nm_config() {
  umask 077 # Required for NM config
  mkdir -p /etc/NetworkManager/system-connections/
  cat >/etc/NetworkManager/system-connections/static.nmconnection <<-EOF
  [connection]
  id=static
  type=ethernet
  autoconnect=true

  [ipv4]
  method=manual
  dns=192.168.100.1
```

```
  address1=192.168.100.42/24,192.168.100.1
EOF
}

if [ "${1-}" = "--prepare" ]; then
  nm_config # Configure NM in the initrd
  exit 0
fi

# Redirect output to the console
exec > >(exec tee -a /dev/tty0) 2>&1

  nm_config # Configure NM in the system
  curl example.com
# Leave a marker
echo "Configured with combustion" > /etc/issue.d/combustion
```

2.2.2.1.3 Partitioning

SLE Micro raw images are delivered with a default partitioning scheme as described in *Section 1.1, "Default partitioning"*. You might want to use a different partitioning. The following set of example snippets moves the `/home` to a different partition.

Note: Performing changes outside of directories included in snapshots

The following script performs changes that are not included in snapshots. If the script fails and the snapshot is discarded, certain changes remain visible and cannot be reverted, for example, the changes to the `/dev/vdb` device.

The following snippet creates a GPT partitioning schema with a single partition on the `/dev/vdb` device:

```
sfdisk /dev/vdb <<EOF
label: gpt
type=linux
EOF

partition=/dev/vdb1
```

The partition is formatted to Btrfs:

```
wipefs --all ${partition}
```

```
mkfs.btrfs ${partition}
```

Possible content of `/home` is moved to the new `/home` folder location by the following snippet:

```
mount /home
mount ${partition} /mnt
rsync -aAXP /home/ /mnt/
umount /home /mnt
```

The snippet below removes an old entry in `/etc/fstab` and creates a new entry:

```
awk -i inplace '$2 != "/home"' /etc/fstab
echo "$(blkid -o export ${partition} | grep ^UUID=) /home btrfs defaults 0 0" >>/etc/
fstab
```

2.2.2.1.4 Creating new users

To add a new user account, first create a hash string that represents the user's password. Use the **`openssl passwd -6`** command.

After you obtain the password hash, add the following lines to the `script`:

```
mount /home
useradd -m EXAMPLE_USER
echo 'EXAMPLE_USER:PASSWORD_HASH' | chpasswd -e
```

2.2.2.1.5 Setting a password for `root`

Before you set the `root` password, generate a hash of the password, for example, by using the **`openssl passwd -6`**. To set the password, add the following line to the `script`:

```
echo 'root:PASSWORD_HASH' | chpasswd -e
```

2.2.2.1.6 Adding SSH keys

The following snippet creates a directory to store the `root`'s SSH key and then copies the public SSH key located on the configuration device to the `authorized_keys` file.

```
mkdir -pm700 /root/.ssh/
cat id_rsa_new.pub >> /root/.ssh/authorized_keys
```

Note

The SSH service must be enabled in case you need to use remote login via SSH. For details, refer to *Section 2.2.2.1.7, "Enabling services"*.

2.2.2.1.7 Enabling services

To enable system services, for example, the SSH service, add the following line to `script`:

```
systemctl enable sshd.service
```

2.2.2.1.8 Installing packages

Important: Network connection and registering your system may be necessary

As certain packages may require additional subscription, you may need to register your system beforehand. An available network connection may also be needed to install additional packages.

During the first boot configuration, you can install additional packages to your system. For example, you can install the `vim` editor by adding:

```
zypper --non-interactive install vim-small
```

Note

Bear in mind that you will not be able to use **`zypper`** after the configuration is complete and you boot to the configured system. To perform changes later, you must use the **`transactional-update`** command to create a changed snapshot.

3 Deploying a selfinstall ISO image

The following procedure describes how to deploy SLE Micro using the selfinstall ISO image:

1. Download the image.

2. Boot your machine with the selfinstall ISO attached.
3. Select *Install SLE Micro* to start the installation process.
4. Select the disk where SLE Micro will be installed and confirm that you want to delete data on the disk. A SLE Micro image is then copied to the disk.
5. Using Kexec, your system reboots and is then prepared for the configuration process.
6. Start the configuration process by selecting *SLE Micro*. If the configuration device is provided, SLE Micro is configured according to the instructions provided on the configuration device. Otherwise JeOS Firstboot is triggered as described in *Section 3.1, "Configuring SLE Micro with JeOS Firstboot"*.
7. **Important: Installation using the selfinstall ISO image does not create a boot EFI entry**

   During the deployment of the selfinstall ISO, the image of the system is just copied to the selected disk, therefore, an EFI boot entry is not created (like it normally would if the system is deployed using an installer). You might need to manually boot your system using the EFI shell by selecting the SLE Micro boot loader. After the first boot, you can use `efibootmgr` to create the boot entry. `efibootmgr` is available by default in the deployed image.

After the configuration process is complete, you can log in to your system.

3.1 Configuring SLE Micro with JeOS Firstboot

When booting SLE Micro for the first time without providing any configuration device, *JeOS Firstboot* enables you to perform a minimal configuration of your system. If you need more control over the deployment process, use a configuration device with either Ignition or Combustion configuration. Find more information in *Section 2.1, "Configuring SLE Micro deployment with Ignition"* and *Section 2.2, "Configuring SLE Micro deployment with Combustion"*.

To configure the system with *JeOS Firstboot*, proceed as follows:

1. *JeOS Firstboot* displays a welcome screen. Confirm with `Enter` .

2. On the next screens, select keyboard, confirm the license agreement and select the time zone.

3. In the *Enter root password* dialog window, enter a password for the `root` and confirm it.

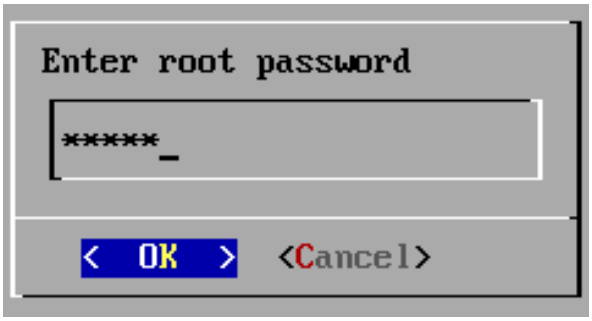

FIGURE 1: ENTER ROOT PASSWORD

4. For encrypted deployments, JeOS Firstboot does the following:

   - Asks for a new passphrase that replaces the default passphrase.
   - Generates a new LUKS key and re-encrypts the partition.
   - Adds a secondary key slot to the LUKS header and seals it against the TPM device.

   If you are deploying an encrypted image, follow these steps:

   a. Select the desired protection method and confirm with *OK*.

   b. Enter a recovery password for LUKS encryption and retype it. The root file system re-encryption begins.

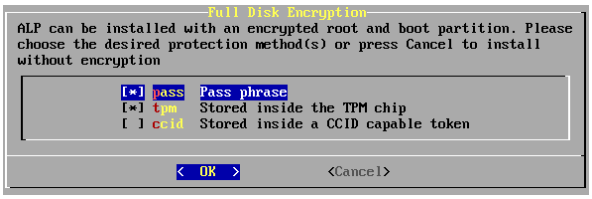

FIGURE 2: SELECT METHOD FOR ENCRYPTION

5. After successful deployment, register your system as described in *Section 4.1, "Registering SLE Micro from CLI"*.

4 Post-deployment steps

4.1 Registering SLE Micro from CLI

After successful deployment, you need to register the system to get technical support and receive updates. Registering the system is possible from the command line using the **`transactional-update register`** command.

To register SUSE Linux Enterprise Micro with SUSE Customer Center, proceed as follows:

1. Run **`transactional-update register`** as follows:

   ```
   # transactional-update register -r REGISTRATION_CODE -e EMAIL_ADDRESS
   ```

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

   ```
   # transactional-update register -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. Reboot your system to switch to the latest snapshot.

3. SUSE Linux Enterprise Micro is now registered.

Note: Other registration options

For information that goes beyond the scope of this section, refer to the inline documentation with **`SUSEConnect --help`**.

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