



SUSE Linux Enterprise Micro 5.1

# Upgrade Guide

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This book guides you through upgrades of SUSE Linux Enterprise Micro.

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<https://documentation.suse.com> 

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# Preface

## 1 Available documentation

### Online documentation

Our documentation is available online at <https://documentation.suse.com>. Browse or download the documentation in various formats.



### Note: Latest updates

The latest updates are usually available in the English-language version of this documentation.

### SUSE Knowledgebase

If you have run into an issue, also check out the Technical Information Documents (TIDs) that are available online at <https://www.suse.com/support/kb/>. Search the SUSE Knowledgebase for known solutions driven by customer need.

### Release notes

For release notes, see <https://www.suse.com/releasesnotes/>.

### In your system

For offline use, the release notes are also available under `/usr/share/doc/release-notes` on your system. The documentation for individual packages is available at `/usr/share/doc/packages`.

Many commands are also described in their *manual pages*. To view them, run `man`, followed by a specific command name. If the `man` command is not installed on your system, install it with `sudo zypper install man`.

## 2 Improving the documentation

Your feedback and contributions to this documentation are welcome. The following channels for giving feedback are available:

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### 3 Documentation conventions

The following notices and typographic conventions are used in this document:

- /etc/passwd: Directory names and file names
- PLACEHOLDER: Replace PLACEHOLDER with the actual value
- PATH: An environment variable
- ls, --help: Commands, options, and parameters
- user: The name of a user or group
- package\_name: The name of a software package
- **Alt** , **Alt - F1** : A key to press or a key combination. Keys are shown in uppercase as on a keyboard.
- *File, File > Save As*: menu items, buttons
- **AMD/Intel** > This paragraph is only relevant for the AMD64/Intel 64 architectures. The arrows mark the beginning and the end of the text block. ◁
- **IBM Z, POWER** > This paragraph is only relevant for the architectures IBM Z and POWER. The arrows mark the beginning and the end of the text block. ◁
- *Chapter 1, “Example chapter”*: A cross-reference to another chapter in this guide.
- Commands that must be run with root privileges. You can also prefix these commands with the sudo command to run them as a non-privileged user:

```
# command  
> sudo command
```

- Commands that can be run by non-privileged users:

```
> command
```

- Commands can be split into two or multiple lines by a backslash character (\) at the end of a line. The backslash informs the shell that the command invocation will continue after the line's end:

```
> echo a b \  
c d
```



- A code block that shows both the command (preceded by a prompt) and the respective output returned by the shell:

```
> command  
output
```

- Notices



### Warning: Warning notice

Vital information you must be aware of before proceeding. Warns you about security issues, potential loss of data, damage to hardware, or physical hazards.



### Important: Important notice

Important information you should be aware of before proceeding.



### Note: Note notice

Additional information, for example about differences in software versions.



### Tip: Tip notice

Helpful information, like a guideline or a piece of practical advice.

- Compact Notices



Additional information, for example about differences in software versions.



Helpful information, like a guideline or a piece of practical advice.

# 1 Upgrade methods

SUSE® Linux Enterprise Micro allows upgrading from an existing system to the new version. No new installation is needed. Existing data, such as home and data directories and system configuration, is kept intact.

Upgrades between two releases of SUSE Linux Enterprise Micro are supported by SUSE. Whether it is better to upgrade or perform a fresh installation depends on your specific scenario. While upgrades involve less work, fresh installations ensure you benefit from all the new features of a release such as disk layout changes, specific filesystem features, and other improvements. To get the most out of your system, SUSE therefore recommends fresh installations in most scenarios.

In both cases—upgrade as well as a fresh installation—customers need to check if system settings and default values still fit their requirements.

## 2 Life cycle and support

This chapter provides background information on terminology, SUSE product life cycles and Service Pack releases, and recommended upgrade policies.

### 2.1 Terminology

This section uses several terms. To understand the information, read the definitions below:

#### Backporting

Backporting is the act of adapting specific changes from a newer version of software and applying it to an older version. The most commonly used case is fixing security holes in older software components. Usually it is also part of a maintenance model to supply enhancements or (less commonly) new features.

#### Delta RPM

A delta RPM consists only of the binary diff between two defined versions of a package, and therefore has the smallest download size. Before being installed, the full RPM package is rebuilt on the local machine.

#### Downstream

A metaphor of how software is developed in the open source world (compare it with *upstream*). The term *downstream* refers to people or organizations like SUSE who integrate the source code from upstream with other software to build a distribution which is then used by end users. Thus, the software flows downstream from its developers via the integrators to the end users.

#### Migration

Updating to a newer release by using the `transactional-update` command line tool. It updates all packages of the installed system to the latest state.

#### Package

A package is a compressed file in `rpm` format that contains all files for a particular program, including optional components like configuration, examples, and documentation.

#### Patch

A patch consists of one or more packages and may be applied by means of delta RPMs. It may also introduce dependencies to packages that are not installed yet.

## Upstream

A metaphor of how software is developed in the open source world (compare it with *downstream*). The term *upstream* refers to the original project, author or maintainer of a software that is distributed as source code. Feedback, patches, feature enhancements, or other improvements flow from end users or contributors to upstream developers. They decide if the request will be integrated or rejected.

If the project members decide to integrate the request, it will show up in newer versions of the software. An accepted request will benefit all parties involved.

If a request is not accepted, it may be for different reasons. Either it is in a state that is not compliant with the project's guidelines, it is invalid, it is already integrated, or it is not in the interest or road map of the project. An unaccepted request makes it harder for upstream developers as they need to synchronize their patches with the upstream code. This practice is generally avoided, but sometimes it is still needed.

## Update

Installation of a newer *minor* version of a package, which usually contains security or bug fixes.

## Upgrade

Installation of a newer *major* version of a package or distribution, which brings *new features*.

## 2.2 Product life cycle

SUSE has the following product life cycle:

- SLE Micro is released twice a year.
- SLE Micro comes with 4 years of general support, except for the 5.0 version that comes with one year general support.

The general support includes the following features:

- Technical Services
- Access to patches, fixes, documentation and the SUSE Knowledge base
- Support for existing stacks and workloads
- Support for new deployments

- Enhancement requests
- Hardware enablement and optimization
- Driver updates via SUSE SolidDriver Program
- Backport of fixes from recent minor versions
- Security updates
- Defect resolution

Refer to <https://www.suse.com/lifecycle> for more information about life cycles, release frequency, and the overlay support period.

## 2.3 Registering and deregistering machines with SUSEConnect

On registration, the system receives repositories from the SUSE Customer Center (see <https://scc.suse.com/>) or a local registration proxy like SMT. The repository names map to specific URIs in the customer center. To list all available repositories on your system, use **zypper** as follows:

```
# zypper repos -u
```

This gives you a list of all available repositories on your system. Each repository is listed by its alias, name and whether it is enabled and will be refreshed. The option `-u` gives you also the URI from where it originated.

To register your machine, run the **transactional-update** as follows:

```
# transactional-update register -r REGCODE
```

To deregister your machine, you can use the **transactional-update** as follows:

```
# transactional-update register -d
```

To check your locally installed products and their status, use the following command:

```
# SUSEConnect -s
```

## 2.4 Identifying the SLE Micro version

If you need to identify the version of an SLE Micro installation, check the content of the file `/etc/os-release`.

A machine readable XML output is available with **zypper**:

```
# zypper --no-remote --no-refresh --xmlout --non-interactive products -i
<?xml version='1.0'?>
<stream>
<product-list>
<product name="SUSE-MicroOS" version="5.0" release="1" epoch="0" arch="x86_64"
  vendor="SUSE" summary="SUSE Linux Enterprise Micro 5.0" repo="@System"
  productline="SUSE-MicroOS" registerrelease="" shortname="SUSE Linux Enterprise
  Micro" flavor="" isbase="true" installed="true"><endoflife time_t="0" text="0"/
><registerflavor/><description>SUSE Linux Enterprise Micro 5.0</description></product>
</product-list>
</stream>
```

## 3 Preparing the upgrade

Before starting the upgrade procedure, make sure your system is properly prepared. Among other things, preparation involves backing up data and checking the release notes. The following chapter guides you through these steps.

### 3.1 Make sure the current system is up-to-date

Upgrading the system is only supported from the most recent patch level. Make sure the latest system updates are installed by running:

```
# transactional-update patch
```

### 3.2 Read the release notes

Find a list of all changes, new features, and known issues in the [release notes \(https://www.suse.com/releasenotes/\)](https://www.suse.com/releasenotes/). You can also find the release notes on the installation media in the `docu` directory.

The release notes usually only contain the changes between two subsequent releases.

Check the release notes to see whether:

- your hardware needs special considerations;
- any used software packages have changed significantly;
- special precautions are necessary for your installation.

### 3.3 Make a backup

Before upgrading, back up your data by copying the existing configuration files to a separate medium (such as tape device, removable hard disk, etc.). This primarily applies to files stored in `/etc` and some directories and files in `/var` and `/opt`. You may also want to write the user data in `/home` (the `HOME` directories) to a backup medium.

Back up all data as `root`. Only `root` has sufficient permissions for all local files.

## 3.4 Listing installed packages and repositories

You can save a list of installed packages, for example when doing a fresh install of a new major SLE release or reverting to the old version.



### Note

Be aware that not all installed packages or used repositories are available in newer releases of SUSE Linux Enterprise. Some may have been renamed and others replaced. It is also possible that some packages are still available for legacy purposes while another package is used by default. Therefore some manual editing of the files might be necessary. This can be done with any text editor.

1. Create a file named repositories.bak.repo containing a list of all used repositories:

```
# zypper lr -e repositories.bak
```

2. Also create a file named installed-software.bak containing a list of all installed packages:

```
# rpm -qa --queryformat '%{NAME}\n' > installed-software.bak
```

3. Back up both files. The repositories and installed packages can be restored with the following commands:

```
# zypper ar repositories.bak.repo  
# transactional-update pkg install $(cat installed-software.bak)
```





## Note: Number of packages increases with an update to a new release

A system upgraded to a new (minor or major) version may contain more packages than the initial system. It could also contain more packages than a fresh installation of the new SLE Micro with the same pattern selection. Reasons for this are:

- Packages were split to allow a more fine-grained package selection.
- When a package has been split, all new packages are installed in the upgrade case to retain the same functionality as with the previous version. However, the new default for a fresh installation of SLE Micro new versions may be to not install all packages.
- Legacy packages from the initial SLE Micro may be kept for compatibility reasons.
- Package dependencies and the scope of patterns may have changed.

## 3.5 Disable the LTSS extension

If you upgrade a SUSE Linux Enterprise Micro system with Long Term Service Pack Support (LTSS) to a version that is still under general support, the upgrade will fail with the error No migration available. This happens because **zypper migration** tries to migrate *all* repositories, but there is no LTSS repository for the new version yet.

To fix this issue, disable the LTSS extension before the upgrade.

1. Check if the LTSS extension is enabled:

```
> sudo SUSEConnect --list-extensions | grep LTSS
SUSE Linux Enterprise Server LTSS 12 SP4 x86_64 (Installed)
Deactivate with: SUSEConnect -d -p SLES-LTSS/12.4/x86_64
```

2. Disable the LTSS extension with the command from the **SUSEConnect** output above:

```
> sudo SUSEConnect -d -p SLES-LTSS/12.4/x86_64
Deregistered SUSE Linux Enterprise Server LTSS 12 SP4 x86_64
To server: https://scc.suse.com/
```

3. Verify the LTSS repository is no longer present with `zypper lr`.

## 3.6 Shut down virtual machine guests

If your machine serves as a VM Host Server for KVM, make sure to properly shut down all running VM Guests prior to the update. Otherwise you may not be able to access the guests after the update.

## 3.7 Disk space

Software tends to grow from version to version. Therefore, take a look at the available partition space before updating. If you suspect you are running short of disk space, back up your data before increasing the available space by resizing partitions, for example. There is no general rule regarding how much space each partition should have. Space requirements depend on your particular partitioning profile and the software selected.

### 3.7.1 Checking disk space on Btrfs root file systems

On a Btrfs file system, the output of `df` can be misleading, because in addition to the space the raw data allocates, a Btrfs file system also allocates and uses space for metadata.

Consequently a Btrfs file system may report being out of space even though it seems that plenty of space is still available. In that case, all space allocated for the metadata is used up. For more information refer to <https://btrfs.wiki.kernel.org/index.php/FAQ>.

Make sure there is enough free space as the root file system uses Btrfs and might consume significant amount of space. Check the available space on all mounted partitions. In the worst case, an upgrade needs as much disk space as the current root file system (without `/ .snapshot`) for a new snapshot.

The following recommendations have been proven:

- For all file systems, including Btrfs, you need enough free disk space to download and install big RPMs. The space of old RPMs is only freed after new RPMs are installed.
- For Btrfs with snapshots, you need as a minimum as much free space as your current installation takes. We recommend having twice as much free space as the current installation.

If you do not have enough free space, you can try to delete old snapshots with snapper:

```
# snapper list
# snapper delete NUMBER
```

However, this may not help in all cases. Before migration, most snapshots occupy only little space.

## 3.8 Adjust the resume boot parameter

On systems that have been installed with SUSE Linux Enterprise Micro 12 or older, the default kernel command line in `/etc/default/grub` may contain a resume parameter using a device node name such as `/dev/sda1` to refer to the hibernation ('suspend-to-disk') device. As device node names are not persistent and may change between reboots, it is strongly recommended to fix this, otherwise the upgraded system may hang on reboot.

1. Find the hibernation device:

```
> sudo grep resume /etc/default/grub
GRUB_CMDLINE_LINUX_DEFAULT="resume=/dev/sda1 splash=silent quiet showopts"
```

The hibernation device is `/dev/sda1`. If the command returns nothing, hibernation is not configured.

2. Get the UUID for `/dev/sda1`:

```
> sudo blkid /dev/vda1
/dev/vda1: UUID="a1d1f2e0-b0ee-4be2-83d5-78a98c585827" TYPE="swap"
PARTUUID="000134b5-01"
```

The UUID for `/dev/sda1` is `a1d1f2e0-b0ee-4be2-83d5-78a98c585827`.

3. Edit `/etc/default/grub` and adjust the resume parameter. Replace `/dev/sda1` with `UUID=a1d1f2e0-b0ee-4be2-83d5-78a98c585827`. The result will look like this:

```
GRUB_CMDLINE_LINUX_DEFAULT="resume=UUID=a1d1f2e0-b0ee-4be2-83d5-78a98c585827
splash=silent quiet showopts"
```

4. Update the configuration of the grub boot manger:

```
> sudo grub2-mkconfig -o /boot/grub2/grub.cfg
```

If the system does not use hibernation, you can simply remove the resume parameter and update the boot configuration.

## 4 Upgrading SLE Micro

SUSE offers a command-line tool to upgrade a running system to a new version. The tool provides support for “rollback” to an older release. This chapter explains how to upgrade your system step by step.

### 4.1 Conceptual overview

SUSE releases new version of SLE Micro at regular intervals. To make it easy for customers to migrate to a new minor version and minimize downtime, SUSE supports migrating online while the system is running.

SLE Micro uses *transactional updates* to upgrade from one version to the next. This has the following advantages:

- The system is always in a defined state until the first RPM is updated.
- Canceling is possible until the first RPM is updated.
- Simple recovery if there is an error.
- It is possible to do a “rollback” via system tools—no backup or restore needed.
- Use of all active repositories.

### 4.2 Upgrading to a new release



#### Note: SUSE Customer Center and Internet connection

If the system you want to upgrade is registered with the SUSE Customer Center, make sure to have an Internet connection during the following procedure.

Proceed as described in [Procedure 4.1, “Upgrade to a newer version”](#) if your system is registered. If your system is not registered, change the repositories to point to the 5.1 and run:

```
# transactional-update dup
```

#### PROCEDURE 4.1: UPGRADE TO A NEWER VERSION

1. The upgrade procedure is performed by calling the **transactional-update**:

```
transactional-update migration
```

2. A new snapshot is created.
3. Current repositories are refreshed.
4. A list of available migration targets is displayed. Enter a number.
5. A list of packages to be installed or updated is displayed. Press y to continue with the upgrade procedure.
6. To complete the upgrade, reboot your system and boot into the target version.

### 4.3 Reverting the migration process

If a new release does not work for you, SLE Micro supports reverting the system to the state before the migration process was started by using the **transactional-update rollback** command.

The detailed procedure for a system rollback is described in *Article "Administration Guide", Section 2 "Administration using transactional updates", Section 2.3 "System rollback"*.

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