SUSE

SUSE Linux Enterprise Server 15 SP6

Modules and Extensions Quick Start

This Quick Start gives you an overview of the modules and extensions available for the SUSE Linux Enterprise family. Learn about their purpose and features, and how to manage them.

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Contents

1 Introduction to modules and extensions

Starting with SUSE Linux Enterprise Server 15, the installation medium consists of only the Unified Installer: a minimal system for deploying, updating and registering SUSE Linux Enterprise Server. During deployment, you can add functionality by selecting modules and extensions to be installed on top of the Unified Installer.

Technically, modules and extensions are very similar. Both can be managed with YaST or the command-line tool **SUSEConnect**. Both modules and extensions add a set of online repositories (`main`, `update`, `source`, `debug`) containing all necessary packages. Additionally, both may add partitioning proposals and system roles that can be chosen during deployment.

However, there are significant differences between modules and extensions:

Modules

Modules allow you to shape the product according to your needs. Each module has a clearly defined scope ranging from tools for Web Development and Scripting, through a Public Cloud, all the way to the SUSE Package Hub, offering community-managed packages.

Modules enable you to provide only the set of packages required for the machine's purpose, making the system lean, fast, and more secure. This modular approach also makes it easy to provide tailor-made images for container and cloud environments.

Modules can be added or removed at any time during the lifecycle of the system. This allows you to easily adjust the system to changing requirements.

Modules are part of your SUSE Linux Enterprise Server subscription and therefore free of charge. They differ from the base of SUSE Linux Enterprise Server only by their lifecycle.

Extensions

Extensions provide advanced capabilities for tasks such as live patching and high availability clustering to SUSE Linux Enterprise Server. They are offered as subscriptions and require a registration key that is liable for costs. Usually, extensions have their own release notes that are available from https://www.suse.com/releasenotes ↗ .

1.1 Support

L3 support is generally provided for packages except for `SUSE Package Hub` and third-party modules. To check the support level for a package, run **zypper info** *PACKAGE*.

`Long-Term Service Pack Support` (LTSS) is available for most modules and extensions. For more information, refer to https://www.suse.com/products/long-term-service-pack-support/ ↗ .

Some modules and extensions also include `Extended Service Pack Overlay Support` (ESPOS), which gives you significantly more time to upgrade and/or skip a service pack completely.

For more information on support and lifecycles, refer to the SUSE Technical Support Policy (https://www.suse.com/support/policy/) ↗ and the Product Lifecycle Support Policies (https://www.suse.com/support/policy-products/) ↗. For a complete list of lifecycle dates by product, refer to the Product Support Lifecycle (https://www.suse.com/lifecycle/) ↗ page.

2 Modules and extensions for the SUSE Linux Enterprise product family

The following modules and extensions are available within the SUSE Linux Enterprise product family:

- *Basesystem*

- *Certifications*

- *Confidential Computing Technology Preview*

- *Containers*

- *Desktop Applications*

- *Development Tools*

- *High Availability*

- *High Performance Computing (HPC)*

- *Legacy*

- *Live Patching*

- *NVIDIA Compute*

- *Public Cloud*

- *Python 3*

- *Real Time*

- *SAP Applications*

- *Server Applications*

- *SUSE Package Hub*

- *Systems Management*

- *Transactional Server*

- *Web and Scripting*

- *Workstation Extension*

Please note that the availability depends on the product. Not all modules and extensions are available for all products. Some modules are included in one product but also available as extension for another.

2.1   Basesystem

This module adds a basic system on top of the Installer. It is required by all other modules and extensions. The scope of an installation that only contains the base system is comparable to the `minimal` system installation pattern of previous SUSE Linux Enterprise Server versions. This module is selected for installation by default and should not be deselected.

- **Dependencies:** None

- **Availability:** Default on all products

- **Lifecycle:** 10 years

- **Extended Support:** 3 years LTSS

- **Support level:** L3

2.2   Certifications

This module contains the FIPS certification packages.

- **Depends on**: Basesystem

- **Available for:** SLES, SLED, SLES for SAP, SUSE Linux Enterprise Real Time

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Support level:** L3

2.3 Confidential Computing Technology Preview

This module contains a Secure Virtual Machine Service Module (SVSM), which aims to provide secure services and device emulations to guest operating systems on confidential virtual machines (CVMs).

> **!** **Important: Technology preview**
>
> The module is a technology preview and is not supported. Its lifecycle and support options will be defined at a later stage.

> **✎** **Note: AMD SEV required**
>
> The SVSM requires AMD Secure Encrypted Virtualization (AMD SEV) with Secure Nested Paging. It will only work on AMD systems.

- **Depends on**: Server Applications

- **Available for:** SLES on AMD64/Intel 64

- **Lifecycle:** Until the release of SLE 15 SP7

- **Extended support:** None

- **Support level:** This module is a technology preview and is not supported.

2.4 Containers

This module contains packages relating to containers, including the container engine and core container-related tools such as on-premise registry.

> **✎** **Note: `docker-stable`**
>
> SUSE ships a package named `docker-stable`, based on selected versions of the the Moby project, which is the upstream for Docker. When this version is no longer supported by the Moby project, SUSE will provide reactive support for an additional 3 years, which may require a LTSS subscription depending on the lifecycle of the underlying product.

✋ Warning: Migration from `docker` to `docker-stable`

In alignment with Moby project practices, SUSE neither tests nor supports downgrading `docker` to older versions. This policy is particularly relevant when considering a migration from the latest `docker` package to the `docker-stable` package, which in most cases would be an older version. Such a downgrade can result in unexpected side effects, compatibility issues and even disruptions to container production environments, and is not recommended for production systems.

❗ Important: Docker Swarm is not supported

SUSE does not provide any support related to use of Docker Swarm orchestration. Related packages are shipped for customer convenience only.

- **Dependencies:** Basesystem

- **Availability:** SLES, SLES for SAP

- **Lifecycle:** By package; follows the upstream community of the respective package.

- **Extended support:** 3 years LTSS

- **Support level:** L3

2.5   Desktop Applications

This module adds a graphical user interface and essential desktop applications to the system.

- **Dependencies:** Basesystem

- **Availability:** SLES, SLED (default), SLE WE (default), SLES for SAP, SLE RT (default)

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.6   Development Tools

This module contains compilers (including `gcc`) and libraries required for compiling and debugging applications. Replaces the former Software Development Kit (SDK).

Dependencies: Basesystem, Desktop Applications

- **Availability:** SLES, SLES for SAP, SLED, SLE RT (default)

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.7   High Availability

This extension provides high-availability clustering technologies that can be deployed in physical and/or virtual environments.

High Availability is included in the subscription for SLES for SAP as a module. It is also available as an extension for SLES. For more information about SUSE Linux Enterprise High Availability, refer to https://www.suse.com/products/highavailability ↗ .

- **Dependencies:** Basesystem, Server Applications

- **Availability:** SLES, SLES for SAP (included), SUSE Linux Enterprise Real Time

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.8   High Performance Computing (HPC)

This module provides specific tools commonly used for high performance, numerically intensive workloads.

SUSE packages these tools in the HPC module to provide greater flexibility to deliver new versions or new tools more rapidly than the standard SUSE Linux Enterprise lifecycle would permit. Packages in this module are generally supported until a newer version of the package is released or a package is dropped from the module.

- **Dependencies:** Basesystem

- **Availability:** SLES on AMD64/Intel 64 and AArch64

- **Lifecycle:** 10 years

- **Extended support:** 1 year ESPOS, 3 years LTSS

- **Level:** L3

2.9 Legacy

This module helps you with migrating applications from earlier versions of SUSE Linux Enterprise Server and other systems to SLES 15 SP6, by providing packages which are discontinued on SUSE Linux Enterprise. Packages in this module are selected based on the requirement for migration and the level of complexity of configuration.

This module is recommended when migrating from a previous product version.

Please note that this module has a different lifecycle than some of its packages. Not all packages are supported for the complete lifecycle of the module, but depend on migration requirements and upstream lifecycles.

- **Dependencies:** Basesystem, Server Applications

- **Availability:** SLES, SLES for SAP

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.10 Live Patching

This extension provides packages to update critical components in SUSE Linux Enterprise without shutting down your system, which reduces planned downtime and increases service availability.

- **Dependencies:** Basesystem

- **Availability:** SLES, SLES for SAP on AMD64/Intel 64, s390x, and ppc64le

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.11   NVIDIA Compute

This module contains the NVIDIA CUDA (Compute Unified Device Architecture) drivers. The software in this module is provided by NVIDIA under the CUDA End User License Agreement (https://docs.nvidia.com/cuda/eula/) ↗ and is not supported by SUSE.

> ### 💡 Tip: Importing third-party GPG keys
>
> As this module is provided by a third party, the repository's GPG key is unknown to the system. To activate the module and import the key with SUSEConnect, use the `--gpg-auto-import-keys` option:
>
> ```
> suseconnect -p sle-module-NVIDIA-compute/15/x86_64 --gpg-auto-import-keys
> ```
>
> Alternatively, you can activate the module with **`yast registration`** or during installation.

> ### ❗ Important: Combining `Workstation Extension` and `NVIDIA Compute module` is unsupported
>
> The `Workstation Extension` provides drivers for NVIDIA graphics cards. These drivers share some packages with CUDA, however, versions may differ. It is therefore neither recommended nor supported to enable both the `NVIDIA Compute Module` and the `Workstation Extension` at the same time.

- **Dependencies:** Basesystem

- **Availability:** SLES on AMD64/Intel 64 and AArch64

- **Support:** Software in this module is provided by NVIDIA and is not supported by SUSE

2.12 Public Cloud

This module contains all tools required to create images for deploying SUSE Linux Enterprise Server in cloud environments. For example: Amazon Web Services (AWS), Microsoft Azure, Google Compute Platform, or OpenStack.

- **Dependencies:** Basesystem, Server Applications

- **Availability:** SLES, SLES for SAP

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.13 Python 3

This module provides two additional Python interpreters:

- Python 3.11 and many additional maintained Python 3.11 modules. The Python 3.11 interpreter and modules are supported until the end of December 2027 and might be updated with the next service pack (if compatible and when needed).

- Python 3.12 with all necessary modules for getting Python modules from PyPI. The Python 3.12 interpreter and modules are supported for 1.5 years until general support for SLE 15 SP6 ends.

Packages from the Python 3 module can be installed alongside existing Python packages, and they can coexist in the same system without impacting Python 3.6 workloads.

- **Dependencies:** Basesystem

- **Availability:** SLES (default), SLES for SAP, SLED (default)

- **Lifecycle:** Python 3.11: 31 Dec 2027, Python 3.12: 1.5 years (end of SLE 15 SP6 general support)

- **Extended support:** None

- **Level:** L3

2.14   Real Time

This extension aims to reduce the latency and increase the predictability and reliability of time-sensitive mission-critical applications.

Packages in this module are generally supported until a newer version of the package is released or the package is dropped from the module.

- **Dependencies:** Basesystem, Desktop Applications, Development Tools, Server Applications
- **Availability:** SLE RT (included)
- **Lifecycle:** 10 years
- **Extended support:** None
- **Level:** L3

2.15   SAP Applications

This module contains packages specific to SLES for SAP. It has a different lifecycle than SUSE Linux Enterprise itself. Subscriptions for SUSE Linux Enterprise Server for SAP applications include 1.5 years of General Support plus 3 years of Extended Service Pack Overlap Support (ESPOS) for each service pack. This eliminates the need for customers to purchase Long Term Service Pack Support (LTSS) until the final service pack of a release.

- **Dependencies:** Basesystem
- **Availability:** SLES for SAP (included)
- **Lifecycle:** 10 years
- **Extended support:** 3 years ESPOS, 3 years LTSS for last SP
- **Level:** L3

2.16   SAP Business One Server

This module contains packages and system configuration specific to SAP Business One Server. It is maintained and supported by the SUSE Linux Enterprise Server product subscription.

- **Dependencies:** Basesystem, Server Applications, Desktop Applications, Development Tools

- **Availability:** SLES (AMD64/Intel 64)

- **Lifecycle:** 10 years

- **Extended support:** 3 LTSS

- **Level:** L3

2.17 Server Applications

This module adds server functionality by providing network services such as DHCP server, name server or Web server. This module is selected for installation by default; deselecting it is not recommended.

- **Dependencies:** Basesystem

- **Availability:** SLES (default), SLES for SAP, SLE RT (default)

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.18 SUSE Package Hub

This module provides access to packages for SUSE Linux Enterprise Server maintained by the openSUSE community. These packages are delivered without L3 support but do not interfere with the supportability of SUSE Linux Enterprise Server. For more information, refer to https://packagehub.suse.com/ ↗ .

- **Dependencies:** Basesystem

- **Availability:** SLES, SLES for SAP, SLE RT, SLED

- **Lifecycle:** None

- **Extended support:** None

- **Level:** None

2.19   Systems Management

This module provides recent and more frequently updated versions of systems management packages such as Salt and Ansible.

- **Dependencies:** Python 3

- **Availability:** SLES, SLES for SAP, SLED

- **Lifecycle:** 6 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.20   Transactional Server

This module provides SUSE Linux Enterprise systems with a method of updating the operating system and its packages in an entirely "atomic" way. Updates are either applied to the system all together in a single transaction, or not at all. This happens without influencing the running system. If an update fails, or if a successful update is deemed to be incompatible or incorrect, you can discard it immediately and return to its previous functioning state.

- **Dependencies:** Basesystem

- **Availability:** SLES

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.21   Web and Scripting

This module contains packages intended for a running Web server.

- **Dependencies:** Basesystem, Server Applications

- **Availability:** SLES, SLES for SAP

- **Lifecycle:** 10 years

- **Extended support:** 3 years LTSS

- **Level:** L3

2.22　Workstation Extension

This extension offers additional desktop applications and libraries. It is installed by default on SUSE Linux Enterprise Desktop. Adding the Workstation Extension to a SUSE Linux Enterprise Server installation allows you to seamlessly combine both products to create a fully featured server workstation. For more information, refer to https://www.suse.com/products/workstation-extension ↗ .

✋ Warning: Unsupported kernel modules

The Workstation Extension installs the `kernel-default-extra` package, which includes additional kernel modules for desktop usage and enables loading of unsupported modules. If actually loaded, these modules may compromise your SLE support status.

Please evaluate if your hardware really requires additional kernel modules, and if so, test this expanded driver set in addition to the default set from the `kernel-default` package for possible configuration conflicts.

To prevent installation of the `kernel-default-extra` package, run **zypper addlock kernel-default-extra**.

- **Dependencies:** Basesystem, Desktop

- **Availability:** SLES, SLED (default), SLES for SAP

- **Lifecycle:** 10 years

- **Extended support:** None

- **Level:** mixed L2/L3 (depending on package)

3　Installing and managing modules and extensions

Modules and extensions can be installed when initially setting up the system and on an existing SUSE Linux Enterprise Server installation.

3.1 Installing modules and extensions during system installation

Modules and extensions can easily be installed when setting up the system. The respective steps are part of the installation routine. Following the default installation path, this requires network access to contact the SUSE Customer Center or a local registration server (SUSE Manager (https://www.suse.com/products/suse-manager/) ↗ or Repository Mirroring Tool), which provide the respective repositories. Offline installation is supported, too. In that case, an additional installation media is required. For detailed information, refer to *Book "Deployment Guide", Chapter 9 "Installation steps", Section 9.8 "Extension and module selection"*.

3.2 Installing modules and extensions with YaST

To install modules & extensions from the running system, you need to make sure your system is registered with the SUSE Customer Center or a local registration server. If you have not done so during the installation, refer to *Book "Deployment Guide", Chapter 10 "Registering SUSE Linux Enterprise and managing modules/extensions", Section 10.3 "Registering from the installed system"* for instructions.
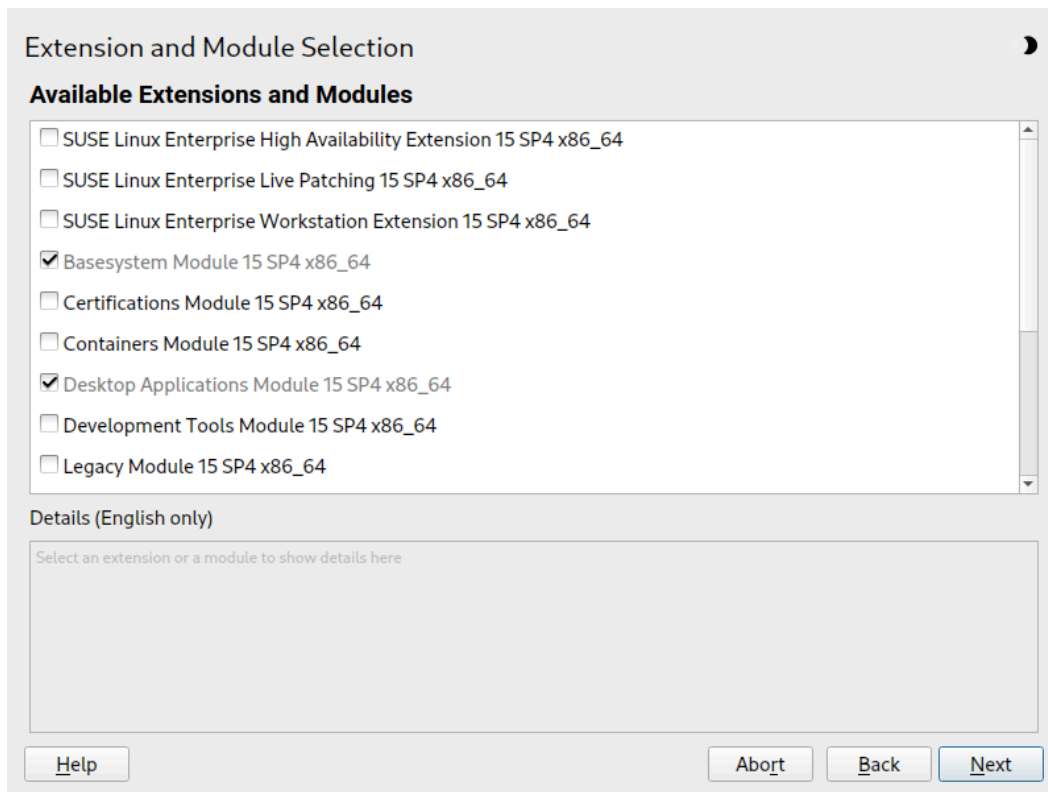
Note: Viewing already installed add-ons

To view already installed add-ons, start YaST and select *Software* › *Add-Ons*.

PROCEDURE 1: INSTALLING ADD-ONS AND EXTENSIONS FROM ONLINE CHANNELS WITH YAST

1. Start YaST and select *Software* › *System Extensions*. YaST connects to the registration server and displays a list of *Available Extensions and Modules*.

Extension and Module Selection

Available Extensions and Modules

- ☐ SUSE Linux Enterprise High Availability Extension 15 SP4 x86_64
- ☐ SUSE Linux Enterprise Live Patching 15 SP4 x86_64
- ☐ SUSE Linux Enterprise Workstation Extension 15 SP4 x86_64
- ☑ Basesystem Module 15 SP4 x86_64
- ☐ Certifications Module 15 SP4 x86_64
- ☐ Containers Module 15 SP4 x86_64
- ☑ Desktop Applications Module 15 SP4 x86_64
- ☐ Development Tools Module 15 SP4 x86_64
- ☐ Legacy Module 15 SP4 x86_64

Details (English only)

Select an extension or a module to show details here

Help   Abort   Back   Next

> ## Note: Available extensions and modules
>
> The number of available extensions and modules depends on the registration server. A local registration server may only offer update repositories and no additional extensions.

2. Click an entry to see its description.

3. To add modules or extensions, select all components you want to install. Note that all extensions require additional registration codes which are liable for cost.

4. Click *Next* to proceed.

5. Depending on the repositories to be added for the extension or module, you may be prompted to import the repository's GPG key or asked to agree to a license.

6. The YaST package manager opens to install `release`-packages for each module and, depending on your choice of modules and extensions, additional packages. It is strongly recommended *not to deselect* any of the preselected packages; you may, however, add additional packages.

Choose *Accept* and *Finish* to conclude the process.

7. If needed, adjust the repository *Properties* as described in *Book "Administration Guide", Chapter 8 "Installing or removing software", Section 8.4.2 "Managing repository properties"*.

> ## Tip: Module dependencies
>
> Similar to software packages, which may depend on other packages to function, a module may have dependencies on other modules. If this is the case, the modules on which it depends are automatically selected for installation.

3.3 Installing extensions and third-party add-on products from media

When installing an extension or add-on product from media, you can select various types of product media, like DVD/CD, removable mass storage devices (such as flash disks), or a local directory or ISO image. The media can also be provided by a network server, for example, via HTTP, FTP, NFS, or Samba.
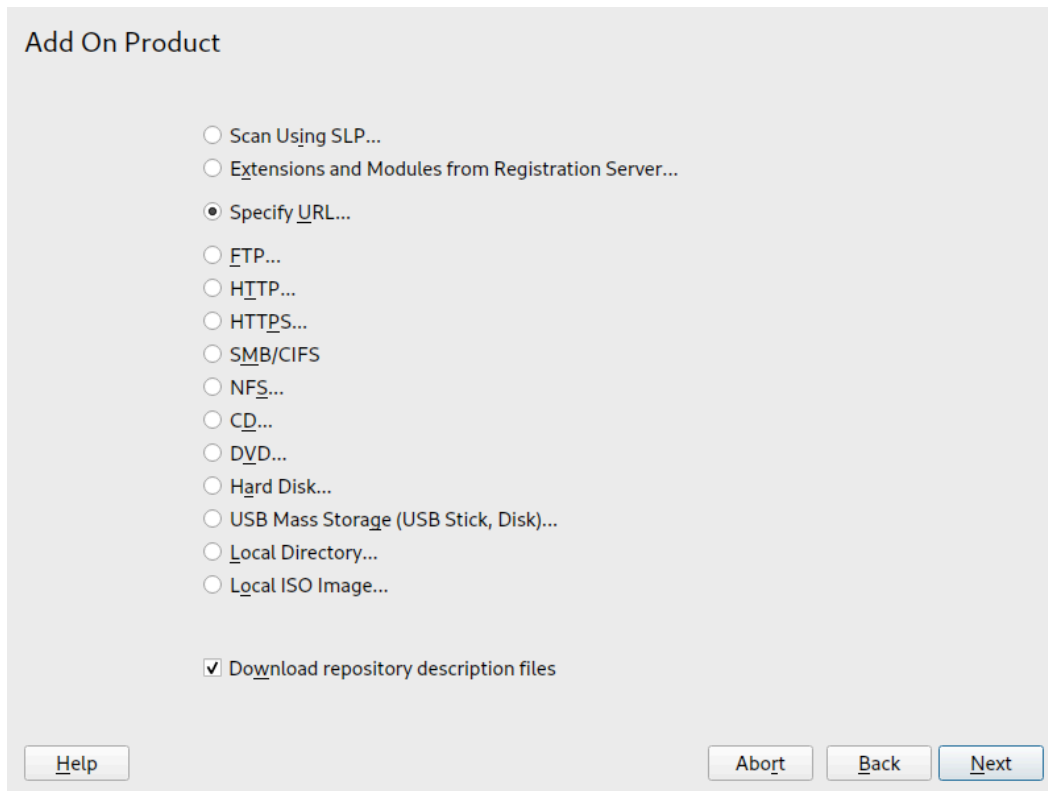
1. Start YaST and select *Software* › *Add-On Products*. Alternatively, start the YaST *Add-On Products* module from the command line with `sudo yast2 add-on`.
   The dialog will show an overview of already installed add-on products, modules and extensions.
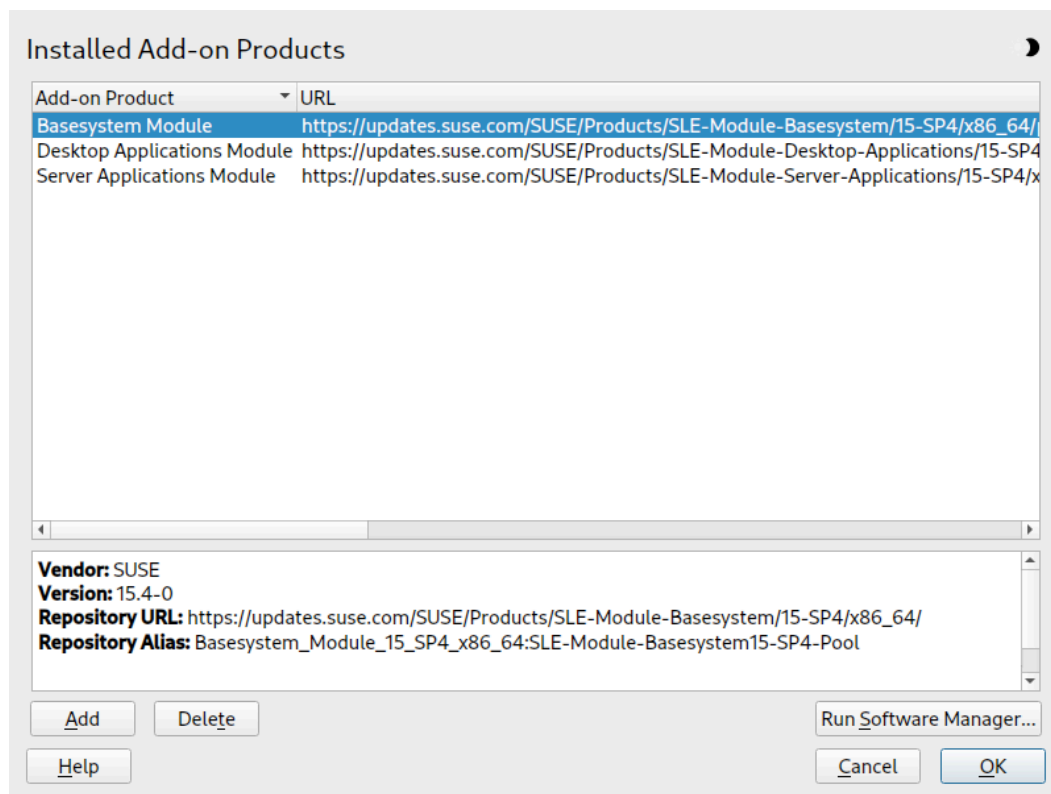
2. Click *Add* to install a new add-on product.

3. In the *Add-On Product* dialog, select the option that matches the type of medium from which you want to install:

```
Add On Product

              ○ Scan Using SLP...
              ○ Extensions and Modules from Registration Server...
              ◉ Specify URL...
              ○ FTP...
              ○ HTTP...
              ○ HTTPS...
              ○ SMB/CIFS
              ○ NFS...
              ○ CD...
              ○ DVD...
              ○ Hard Disk...
              ○ USB Mass Storage (USB Stick, Disk)...
              ○ Local Directory...
              ○ Local ISO Image...

              ☑ Download repository description files

  Help                                    Abort    Back    Next
```

- To scan your network for installation servers announcing their services via SLP, select *Scan Using SLP* and click *Next*.

- To add a repository from a removable medium, choose the relevant option and insert the medium or connect the USB device to the machine, respectively. Click *Next* to start the installation.

- For most media types, you will be prompted to specify the path (or URL) to the media after selecting the respective option and clicking *Next*. Specifying a *Repository Name* is optional. If none is specified, YaST will use the product name or the URL as the repository name.

The option *Download Repository Description Files* is activated by default. If you deactivate the option, YaST will automatically download the files later, if needed.

4. Depending on the repository you have added, you may be prompted to import the repository's GPG key or asked to agree to a license.

After confirming these messages, YaST will download and parse the metadata. It will add the repository to the list of *Configured Repositories*.

5. If needed, adjust the repository *Properties* as described in *Book "Administration Guide", Chapter 8 "Installing or removing software", Section 8.4.2 "Managing repository properties"*.

6. Confirm your changes with *OK* to close the configuration dialog.

7. After having successfully added the repository for the add-on media, the software manager starts, and you can install packages. For details, refer to *Book "Administration Guide", Chapter 8 "Installing or removing software"*.

3.4   Deleting modules and extensions with YaST

1. Start *YaST › Software › Add-On Products*.
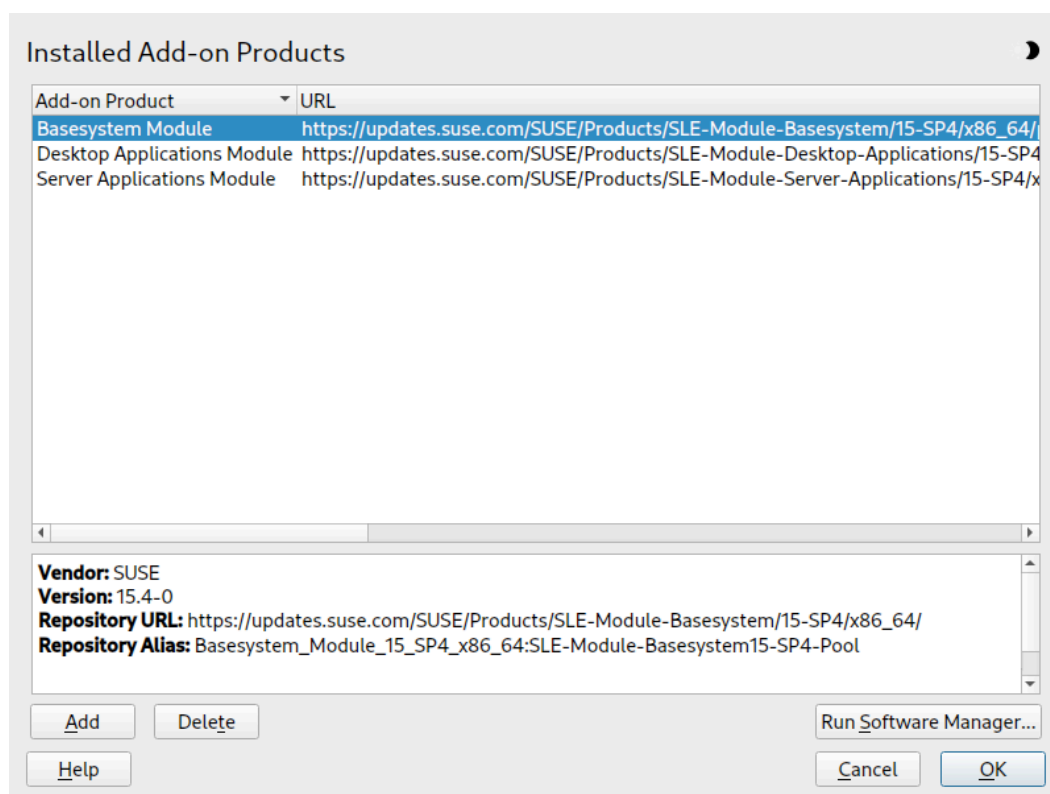
2. Choose the module or extension that should be removed and click *Delete*. Confirm the warning saying that all packages from the selected component will be removed.

3. The YaST Software Manager opens and lists all installed packages from the deleted module or extension. Click *Accept* to remove all of them. It is strongly recommended to do so, because you will no longer get updates for packages from deleted modules or extensions. If you keep packages, make sure to at least remove the `*-release` package for each module or extension that gets deleted.

   Proceed with *Accept* and then *OK*.

✋ Warning: Deleting modules

Note that you should never delete the *Basesystem Module*. It is also not recommended to delete the *Server Applications Module*.

✋ Warning: No updates for packages from deleted modules and extensions

If you choose to keep packages from deleted modules or extensions, you will no longer receive updates for these packages. Because this includes security fixes, keeping such packages may introduce a security risk to your system.

3.5 Adding or deleting modules and extensions with SUSEConnect

1. Run **SUSEConnect --list-extensions** to get an overview of available extensions:

```
> sudo SUSEConnect --list-extensions
AVAILABLE EXTENSIONS AND MODULES

    Basesystem Module 15 SP6 x86_64 (Activated)
    Deactivate with: SUSEConnect -d -p sle-module-basesystem/15.6/x86_64

        Containers Module 15 SP6 x86_64
        Activate with: SUSEConnect -p sle-module-containers/15.6/x86_64

        Desktop Applications Module 15 SP6 x86_64
        Activate with: SUSEConnect -p sle-module-desktop-applications/15.6/x86_64

            Development Tools Module 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-module-development-tools/15.6/x86_64

                NVIDIA Compute Module 15 x86_64
                Activate with: SUSEConnect -p sle-module-NVIDIA-compute/15/x86_64
```

```
            SUSE Linux Enterprise Workstation Extension 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-we/15.6/x86_64 -r ADDITIONAL REGCODE

        Python 3 Module 15 SP6 x86_64
        Activate with: SUSEConnect -p sle-module-python3/15.6/x86_64

        SUSE Linux Enterprise Live Patching 15 SP6 x86_64
        Activate with: SUSEConnect -p sle-module-live-patching/15.6/x86_64 -
r ADDITIONAL REGCODE

        SUSE Package Hub 15 SP6 x86_64
        Activate with: SUSEConnect -p PackageHub/15.6/x86_64

        Server Applications Module 15 SP6 x86_64 (Activated)
        Deactivate with: SUSEConnect -d -p sle-module-server-applications/15.6/
x86_64

            Legacy Module 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-module-legacy/15.6/x86_64

            Public Cloud Module 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-module-public-cloud/15.6/x86_64

            SUSE Linux Enterprise High Availability Extension 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-ha/15.6/x86_64 -r ADDITIONAL REGCODE

            Web and Scripting Module 15 SP6 x86_64
            Activate with: SUSEConnect -p sle-module-web-scripting/15.6/x86_64

        Transactional Server Module 15 SP6 x86_64
        Activate with: SUSEConnect -p sle-module-transactional-server/15.6/x86_64

    Certifications Module 15 SP6 x86_64
    Activate with: SUSEConnect -p sle-module-certifications/15.6/x86_64


REMARKS

(Not available) The module/extension is not enabled on your RMT/SMT
(Activated)     The module/extension is activated on your system

MORE INFORMATION

You can find more information about available modules here:
https://www.suse.com/documentation/sles-15/singlehtml/art_modules/art_modules.html
```

2. Run the commands in the listing for activating/deactivating a module or extension to add or delete a component. Note that adding an extension requires additional registration codes which are liable for cost.

🖐 Warning: Deleting modules

Note that you should never delete the *Basesystem Module*. It is also not recommended to delete the *Server Applications Module*.

❗ Important: No automatic installation or removal of packages

`SUSEConnect` only adds or removes modules and extensions. It registers or deregisters the components and enables or disables their repositories, but it does not install or remove any packages. If you want this to be done automatically, use YaST to manage modules and extensions.

When adding a module or extension, `SUSEConnect` does not install default packages or patterns. To do this manually, use Zypper or *YaST › Software Management*.

When deleting a module or extension, `SUSEConnect` does not perform a cleanup. Packages from the module or extension remain installed on the system, but are no longer updated from a repository. To list these "orphaned" packages, run `zypper packages --orphaned`. To remove one or more packages, run `zypper remove PACKAGE [ANOTHER_PACKAGE]`. Alternatively, use *YaST › Software Management* and then *View › Package Classification › Orphaned Packages* to list and delete orphaned packages.

🖐 Warning: No updates for packages from deleted modules and extensions

If you choose to keep packages from deleted modules or extensions, you will no longer receive updates for these packages. Because this includes security fixes, keeping such packages may introduce a security risk to your system.

4 Module membership of packages

By default, tools for searching software packages (YaST Software Management or `zypper search`) are restricted to searching within active repositories. For an extended search including not yet activated remote repositories, you can run

```
zypper search-packages PACKAGE
```

> 💡 **Tip: Searching for packages in the SUSE Customer Center**
>
> You can also search for packages and their respective modules in the SUSE Customer Center Web interface at https://scc.suse.com/packages ↗. A SUSE login is *not* required for this service.

To refine the search results, `zypper search-packages` offers the following options:

`-x, --match-exact`

    Searches for exact matches.

`-g, --group-by-module`

    Groups the search results by modules rather than by package name.

`-d, --details`

    Additionally lists version numbers and repositories containing the package.

`--xmlout`

    Generates XML output.

Below are a few examples of how to use `zypper search-packages`.

EXAMPLE 1: SIMPLE SEARCH

> The following command searches for the packages `nodejs` and `hawk`. The first one is available in the `Web and Scripting` module, while the second one is part of SUSE Linux Enterprise High Availability. Both packages are not yet installed:
>
> ```
> > zypper search-packages openjdk nodejs
> Following packages were found in following modules:
>
> Package          Module or Repository
>                      SUSEConnect Activation Command
> ```

```
--------------- ----------------------------------------------------------------
----------------- ----------------------------------------------------------------
java-11-openjdk  Basesystem Module (sle-module-basesystem/15.4/x86_64)
                     SUSEConnect --product sle-module-basesystem/15.4/x86_64
java-17-openjdk  Basesystem Module (sle-module-basesystem/15.4/x86_64)
                     SUSEConnect --product sle-module-basesystem/15.4/x86_64
nodejs14         Web and Scripting Module (sle-module-web-scripting/15.4/x86_64)
                     SUSEConnect --product sle-module-web-scripting/15.4/x86_64
nodejs16         Web and Scripting Module (sle-module-web-scripting/15.4/x86_64)
                     SUSEConnect --product sle-module-web-scripting/15.4/x86_64
[...]
```

EXAMPLE 2: SEARCHING FOR EXACT MATCHES

If you know the exact package names, you can narrow the results down to exact matches by using the option -x:

```
> zypper search-packages -x java-11-openjdk nodejs14
Following packages were found in following modules:

Package          Module or Repository
                     SUSEConnect Activation Command
--------------- ----------------------------------------------------------------
----------------- ----------------------------------------------------------------
java-11-openjdk  Basesystem Module (sle-module-basesystem/15.4/x86_64)
                     SUSEConnect --product sle-module-basesystem/15.4/x86_64
nodejs14         Web and Scripting Module (sle-module-web-scripting/15.4/x86_64)
                     SUSEConnect --product sle-module-web-scripting/15.4/x86_64
[...]
```

EXAMPLE 3: SEARCHING FOR PACKAGES THAT ARE ALREADY INSTALLED OR AVAILABLE

If you search for packages that are already installed or are available in one of the modules that are available on your system, the search results differ. In the following example, the package vim is already installed. The package emacs is not installed, but is available for installation without having to add a module.

```
> zypper search-packages -x vim
Following packages were found in following modules:

Package  Module or Repository
           SUSEConnect Activation Command
--- ---------------------------------------------------------------------------------
---------- ---------------------------------------------------------------------------------
vim Basesystem Module (sle-module-basesystem/15.4/x86_64)
      SUSEConnect --product sle-module-basesystem/15.4/x86_64
vim Installed
vim Available in repo Basesystem_Module_15_SP4_x86_64:SLE-Module-Basesystem15-SP4-Pool
vim Available in repo Basesystem_Module_15_SP4_x86_64:SLE-Module-Basesystem15-SP4-Updates
```

```
> zypper search-packages -x emacs
Following packages were found in following modules:

Package Module or Repository
        SUSEConnect Activation Command
----- --------------------------------------------------------------------------
--------- ----------------------------------------------------------------------
emacs Basesystem Module (sle-module-basesystem/15.4/x86_64)
        SUSEConnect --product sle-module-basesystem/15.4/x86_64
emacs Available in repo Basesystem_Module_15_SP4_x86_64:SLE-Module-Basesystem15-SP4-Pool
```

Instead of searching for packages, you can also view the list of packages that belong to a module or extension. Start the YaST *Software Management* module and click *View › Services*. Select an entry to display the list of packages that belong to this module or extension.

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