

## SUSE Linux Enterprise Server 15 SP7

# 模块和扩展快速入门

本快速入门概述了 SUSE Linux Enterprise 系列的可用模块和扩展，并介绍了它们的用途和功能以及如何管理它们。

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# 1 模块和扩展简介

从 SUSE Linux Enterprise Server 15 开始，安装媒体仅包含统一安装程序：一个用于部署、更新和注册 SUSE Linux Enterprise Server 的精简系统。在部署期间，您可以通过选择要在统一安装程序的基础上安装的模块和扩展来添加功能。

从技术上讲，模块和扩展非常类似。可以使用 YaST 或命令行工具 **SUSEConnect** 管理两者。模块和扩展都会添加一组包含所有必要软件包的联机储存库（main、update、source、debug）。此外，它们都可添加可以在部署期间选择的分区建议和系统角色。

不过，模块和扩展之间也存在一些重大差异：

## 模块

模块可让您根据需要定制产品功能。每个模块都有明确定义的范围，从用于进行 Web 开发和编写脚本的工具到公共云、再到 SUSE Package Hub（提供由社区管理的软件包）。利用模块，您可以仅提供满足计算机用途所需的一组软件包，从而精简系统、加快其运行速度，并提高其安全性。这种模块化方法还可让您轻松提供专为容器和云环境定制的映像。

您可以在系统的整个生命周期内随时添加或去除模块。这样您便可轻松调整系统以满足不断变化的要求。

模块属于您的 SUSE Linux Enterprise Server 订阅的一部分，因此可免费使用。模块与 SUSE Linux Enterprise Server 基础系统的唯一不同之处就是生命周期。

## 扩展

扩展为 SUSE Linux Enterprise Server 的在线增补和高可用性群集组建等任务提供高级功能。它们以订阅的形式提供，需要注册密钥，因此需付费才能使用。<https://www.suse.com/releasesnotes> 上通常会提供各扩展的发行说明。

## 1.1 支持

一般会对软件包提供 L3 支持（SUSE Package Hub 和第三方模块除外）。要检查软件包的支持级别，请运行 **zypper info PACKAGE**。

Long-Term Service Pack Support (LTSS) 适用于大多数模块和扩展。有关详细信息，请参见 <https://www.suse.com/products/long-term-service-pack-support/>。

某些模块和扩展还包含 Extended Service Pack Overlay Support (ESPOS)，该服务可为您提供更多时间来升级和/或完全跳过服务包。

有关支持和生命周期的详细信息，请参见 [SUSE 技术支持策略 \(https://www.suse.com/support/policy/\)](https://www.suse.com/support/policy/) 和 [产品生命周期支持策略 \(https://www.suse.com/support/policy-products/\)](https://www.suse.com/support/policy-products/)。如需各产品生命周期日期的完整列表，请参见 [产品支持生命周期 \(https://www.suse.com/lifecycle/\)](https://www.suse.com/lifecycle/) 页面。

## 2 SUSE Linux Enterprise 产品系列的模块和扩展

SUSE Linux Enterprise 产品系列中提供下列模块和扩展：

- Basesystem
- Certifications
- Confidential Computing Technology Preview
- Containers
- 桌面应用程序
- 开发工具
- 高可用性
- High Performance Computing (HPC)
- Legacy
- Live Patching
- NVIDIA Compute
- Public Cloud
- Python 3
- Real Time
- SAP Applications

- Server Applications
- SUSE Package Hub
- 系统管理
- Transactional Server
- Web and Scripting
- Workstation Extension

请注意，可用性视产品而定。并非所有模块和扩展都可用于所有产品。有些模块包含在一个产品中，但也可以用作另一个产品的扩展。

## 2.1 Basesystem

此模块在安装程序的基础上添加一个基本系统。其他所有模块和扩展都需要此模块。只包含基础系统的安装范围相当于旧版 SUSE Linux Enterprise Server 的 minimal 系统安装软件集。系统默认已选择安装此模块，不应将其取消选择。

- **依赖项：**无
- **可用性：**默认所有产品上均提供
- **生命周期：**10 年
- **扩展支持：**3 年 LTSS
- **支持级别：**L3

## 2.2 Certifications

此模块包含 FIPS 认证软件包。

- **取决于：**Basesystem
- **适用于：**SLES、SLED、SLES for SAP、SUSE Linux Enterprise Real Time
- **生命周期：**10 年

- **扩展支持：**3 年 LTSS
- **支持级别：**L3

## 2.3 Confidential Computing Technology Preview

该模块包含一个安全虚拟机服务模块 (SVSM)，旨在为机密虚拟机 (CVM) 上的 Guest 操作系统提供安全服务和设备模拟功能。



### 重要：技术预览

该模块为技术预览，不受支持。其生命周期和支持选项将在后续阶段确定。



### 注意：需要 AMD SEV

SVSM 需要使用具有安全嵌套分页功能的 AMD 安全加密虚拟化 (AMD SEV) 技术，仅适用于 AMD 系统。

- **取决于：**Server Applications
- **适用于：**AMD64/Intel 64 上的 SLES
- **生命周期：**直到 SLE 15 SP7 发布
- **扩展支持：**无
- **支持级别：**此模块为技术预览，不受支持。

## 2.4 Containers

此模块包含与容器相关的软件包，包括容器引擎和核心的容器相关工具（例如本地注册表）。



### 注意：docker-stable

SUSE 基于 Docker 上游 Moby 项目的选定版本，提供名为 `docker-stable` 的软件包。

当该版本不再获得 Moby 项目支持时，SUSE 将额外提供为期 3 年的响应式支持（根据基础产品的生命周期，可能需要 LTSS 订阅）。



## 警告：从 docker 迁移到 docker-stable

根据 Moby 项目实践要求，SUSE 既不会测试也不支持将 `docker` 降级至旧版本。在考虑从最新版 `docker` 软件包迁移至 `docker-stable` 软件包（通常为较旧版本）时，此策略尤为重要。此类降级操作可能导致意外的副作用、兼容性问题甚至干扰容器生产环境，因此不建议在生产系统中执行。



## 重要：不支持 Docker Swarm

SUSE 不提供任何与使用 Docker Swarm 编排相关的支持。提供相关软件包只是为了方便客户。

- **依赖项：**Basesystem
- **可用性：**SLES、SLES for SAP
- **生命周期：**按软件包管理；各软件包的生命周期遵循其对应上游社区的规定。
- **扩展支持：**3 年 LTSS
- **支持级别：**L3

## 2.5 桌面应用程序

此模块可向系统添加图形用户界面和最基本的桌面应用程序。

- **依赖项：**Basesystem
- **可用性：**SLES、SLED（默认）、SLE WE（默认）、SLES for SAP、SLE RT（默认）
- **生命周期：**10 年
- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.6 开发工具

此模块包含编译及调试应用程序所需的编译器（包括 `gcc`）和库。取代了以前的 Software Development Kit (SDK)。

**依赖项：** Basesystem、Desktop Applications

- **可用性：** SLES、SLES for SAP、SLED、SLE RT（默认）
- **生命周期：** 10 年
- **扩展支持：** 3 年 LTSS
- **级别：** L3

## 2.7 高可用性

此扩展提供可在物理和/或虚拟环境中部署的高可用性群集技术。

High Availability 以模块形式包含在 SLES for SAP 订阅中。它还可作为 SLES 的扩展提供。

有关 SUSE Linux Enterprise High Availability 的详细信息，请参见 <https://www.suse.com/products/highavailability>。

- **依赖项：** Basesystem、Server Applications
- **可用性：** SLES、SLES for SAP（随附）、SUSE Linux Enterprise Real Time
- **生命周期：** 10 年
- **扩展支持：** 3 年 LTSS
- **级别：** L3

## 2.8 High Performance Computing (HPC)

此模块提供常用于高性能计算密集型工作负载的特定工具。

SUSE 将这些工具打包到 HPC 模块中，旨在提供更大的灵活性，以比标准 SUSE Linux Enterprise 生命周期允许的速度更快地交付新版本或新工具。对此模块中的软件包的支持一般会持续到有更新版本的软件包发布或软件包从此模块中删除时为止。

- **依赖项:** Basesystem
- **可用性:** AMD64/Intel 64 和 AArch64 上的 SLES
- **生命周期:** 10 年
- **扩展支持:** 1 年 ESPOS, 3 年 LTSS
- **级别:** L3

## 2.9 Legacy

此模块通过提供 SUSE Linux Enterprise 中已停用的软件包，帮助您将应用程序从 SUSE Linux Enterprise Server 早期版本和其他系统迁移到 SLES 15 SP7。此模块中的软件包是根据迁移要求和配置复杂程度选择的。

从旧版产品迁移时，建议使用此模块。

请注意，此模块的生命周期与其自身所含的一些软件包不同。并非所有软件包都支持该模块的完整生命周期，具体视迁移要求和上游生命周期而定。

- **依赖项:** Basesystem、Server Applications
- **可用性:** SLES、SLES for SAP
- **生命周期:** 10 年
- **扩展支持:** 3 年 LTSS
- **级别:** L3

## 2.10 Live Patching

此扩展提供无需关闭系统即可更新 SUSE Linux Enterprise 中的关键组件的软件包，有助于减少计划内停机时间和提高服务可用性。

- **依赖项:** Basesystem
- **可用性:** SLES; AMD64/Intel 64、s390x 和 ppc64le 上的 SLES for SAP



- **生命周期:** 10 年
- **扩展支持:** 3 年 LTSS
- **级别:** L3

## 2.11 NVIDIA Compute

此模块包含 NVIDIA CUDA (Compute Unified Device Architecture, 统一计算设备架构) 驱动程序。此模块中的软件由 NVIDIA 按照 [CUDA 最终用户许可协议 \(https://docs.nvidia.com/cuda/eula/\)](https://docs.nvidia.com/cuda/eula/) 提供, SUSE 不提供其相关支持。



### 提示: 导入第三方 GPG 密钥

由于此模块由第三方提供, 系统无法识别储存库的 GPG 密钥。要激活该模块并使用 SUSEConnect 导入密钥, 请使用 `--gpg-auto-import-keys` 选项:

```
suseconnect -p sle-module-NVIDIA-compute/15/x86_64 --gpg-auto-import-keys
```

或者, 可以使用 `yast registration` 激活该模块, 或者在安装过程中激活。



### 重要: 不支持将 Workstation Extension 和 NVIDIA Compute module 结合使用

Workstation Extension 为 NVIDIA 显卡提供驱动程序。这些驱动程序与 CUDA 共用某些软件包, 但它们的版本可能不同。因此, 既不建议也不支持同时启用 NVIDIA Compute Module 和 Workstation Extension。

- **依赖项:** Basesystem
- **可用性:** AMD64/Intel 64 和 AArch64 上的 SLES
- **支持:** 此模块中的软件由 NVIDIA 提供, SUSE 不提供相关支持

## 2.12 Public Cloud

此模块包含创建在云环境中部署 SUSE Linux Enterprise Server 的映像所需的全部工具。  
例如：Amazon Web Services (AWS)、Microsoft Azure、Google Compute Platform 或 OpenStack。

- **依赖项：**Basesystem、Server Applications
- **可用性：**SLES、SLES for SAP
- **生命周期：**10 年
- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.13 Python 3

此模块提供两个额外的 Python 解释器：

- Python 3.11 和许多额外维护的 Python 3.11 模块。对 Python 3.11 解释器和模块的支持将截止到 2029 年 12 月底，并且可能会通过下一个服务包更新它们（如果兼容且需要）。
- Python 3.13 以及从 PyPI 获取 Python 模块所需的所有模块。Python 3.13 解释器和模块的支持期限为 1.5 年，截至 2026 年 12 月底。

Python 3 模块中的软件包可以与现有 Python 软件包一起安装，它们可以在同一系统中共存，而不会影响 Python 3.6 工作负载。

- **依赖项：**Basesystem
- **可用性：**SLES（默认）、SLES for SAP、SLED（默认）
- **生命周期：**Python 3.11：2029 年 12 月 31 日；Python 3.13：2026 年 12 月 31 日
- **扩展支持：**无
- **级别：**L3

## 2.14 Real Time

此扩展旨在降低延迟，并提高对时间敏感的任务关键型应用程序的可预测性和可靠性。

对此模块中的软件包的支持一般会持续到有更新版本的软件包发布或软件包从此模块中删除时为止。

- **依赖项：**Basesystem、Desktop Applications、Development Tools、Server Applications
- **可用性：**SLE-RT（已包含）
- **生命周期：**10 年
- **扩展支持：**无
- **级别：**L3

## 2.15 SAP Applications

此模块包含特定于 SLES for SAP 的软件包。它的生命周期与 SUSE Linux Enterprise 产品本身不同。SUSE Linux Enterprise Server for SAP Applications 的订阅包含 1.5 年的一般支持外加每个服务包各 3 年的延期服务包重叠支持 (ESPOS)。因此，在产品版本的最后一个服务包之前，客户将无需购买长期服务包支持 (LTSS)。

- **依赖项：**Basesystem
- **可用性：**SLES for SAP（含）
- **生命周期：**10 年
- **扩展支持：**3 年 ESPOS、3 年 LTSS（针对最后一个 SP）
- **级别：**L3

## 2.16 SAP Business One Server

此模块包含专用于 SAP Business One Server 的软件包和系统配置。通过 SUSE Linux Enterprise Server 产品订阅来对该模块提供维护和支持。

- **依赖项：**基础系统、服务器应用程序、桌面应用程序、开发工具
- **可用性：**SLES (AMD64/Intel 64)
- **生命周期：**10 年
- **扩展支持：**3 LTSS
- **级别：**L3

## 2.17 Server Applications

此模块通过提供 DHCP 服务器、名称服务器或 Web 服务器等网络服务来增加服务器功能。系统默认已选择安装此模块；不建议将其取消选择。

- **依赖项：**Basesystem
- **可用性：**SLES（默认）、SLES for SAP、SLE RT（默认）
- **生命周期：**10 年
- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.18 SUSE Package Hub

此模块用于访问 openSUSE 社区维护的各个 SUSE Linux Enterprise Server 软件包。对于这些软件包不提供 L3 支持，但这不影响对 SUSE Linux Enterprise Server 的支持。有关详细信息，请参见 <https://packagehub.suse.com/>。

- **依赖项：**Basesystem
- **可用性：**SLES、SLES for SAP、SLE RT SLED
- **生命周期：**无
- **扩展支持：**无
- **级别：**无

## 2.19 系统管理

此模块提供系统管理软件包（如 Salt 和 Ansible）的最新和更频繁更新版本。

- **依赖项：**Python 3
- **可用性：**SLES、SLES for SAP、SLED
- **生命周期：**6 年
- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.20 Transactional Server

此模块为 SUSE Linux Enterprise 系统提供以“原子”方式整体更新操作系统及其软件包的方法。更新将以单个事务的形式统一应用到系统，或者全部都不应用。这种方式不会影响正在运行的系统。如果更新失败，或者如果成功更新被视为不兼容或不正确，您可以立即将其丢弃并恢复到先前的正常运行状态。

- **依赖项：**Basesystem
- **可用性：**SLES
- **生命周期：**10 年
- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.21 Web and Scripting

此模块包含用于运行中 Web 服务器的软件包。

- **依赖项：**Basesystem、Server Applications
- **可用性：**SLES、SLES for SAP
- **生命周期：**10 年

- **扩展支持：**3 年 LTSS
- **级别：**L3

## 2.22 Workstation Extension

此扩展提供额外的桌面应用程序和库。SUSE Linux Enterprise Desktop 上默认已安装该扩展。通过在 SUSE Linux Enterprise Server 安装中添加 Workstation Extension，您可以将这两个产品无缝融合，以创建功能完备的服务器工作站。有关详细信息，请参见 <https://www.suse.com/products/workstation-extension>。



### 警告：不支持的内核模块

Workstation Extension 会安装 `kernel-default-extra` 软件包，该软件包包含用于桌面用途的其他内核模块，并可用于加载不受支持的模块。如果加载了这些模块，它们可能会影响您的 SLE 支持状态。

请评估您的硬件是否确实需要其他内核模块，如果需要，请测试此扩展驱动程序集以及 `kernel-default` 软件包中的默认驱动程序集是否可能存在配置冲突。

要阻止安装 `kernel-default-extra` 软件包，请运行 `zypper addlock kernel-default-extra`。

- **依赖项：**Basesystem、Desktop
- **可用性：**SLES、SLED（默认）、SLES for SAP
- **生命周期：**10 年
- **扩展支持：**无
- **级别：**L2/L3 混合（取决于软件包）

## 3 安装和管理模块与扩展

在最初设置系统时以及在已安装的现有 SUSE Linux Enterprise Server 系统上可以安装模块和扩展。

## 3.1 在系统安装期间安装模块和扩展

在设置系统时可以轻松安装模块和扩展。相应步骤属于安装例程的一部分。如果使用默认安装路径，您需要拥有网络访问权限以访问提供相应储存库的 SUSE Customer Center 或本地注册服务器（SUSE Multi-Linux Manager (<https://www.suse.com/products/multi-linux-manager/>) 或 Repository Mirroring Tool）。您也可以采用脱机安装方式。脱机安装需要额外的安装媒体。有关详细信息，请参见《部署指南》，第 9 章“安装步骤”，第 9.8 节“扩展和模块选择”。

## 3.2 使用 YaST 安装模块和扩展

要从正在运行的系统安装模块和扩展，您需要确保系统已在 SUSE Customer Center 或本地注册服务器中注册。如果您在安装期间未注册系统，请参考《部署指南》，第 10 章“注册 SUSE Linux Enterprise 和管理模块/扩展”，第 10.3 节“从安装的系统注册”中的相关说明。



### 注意：查看已安装的附加产品

要查看已安装的附加产品，请启动 YaST 并选择软件 > 附加组件。

#### 过程 1：使用 YAST 通过联机通道安装附加产品和扩展

1. 启动 YaST，然后选择软件 > 系统扩展。YaST 将连接到注册服务器并显示可用扩展和模块列表。

**扩展和模块选择**

**可用扩展和模块**

- ☐ SUSE Linux Enterprise High Availability Extension 15 SP7 x86\_64
- ☐ SUSE Linux Enterprise Live Patching 15 SP7 x86\_64
- ☐ SUSE Linux Enterprise Workstation Extension 15 SP7 x86\_64
- ☒ Basesystem Module 15 SP7 x86\_64
- ☐ Certifications Module 15 SP7 x86\_64
- ☐ Containers Module 15 SP7 x86\_64
- ☒ Desktop Applications Module 15 SP7 x86\_64
- ☐ Development Tools Module 15 SP7 x86\_64
- ☐ Legacy Module 15 SP7 x86\_64

**详细信息（仅限英语）**

在此处选择扩展或模块以显示细节

帮助(H)      中止(R)      后退(B)      下一步(N)



## 注意：可用扩展和模块

可用扩展和模块数视注册服务器而定。本地注册服务器可能只提供更新储存库，而不提供其他扩展。

2. 单击一项可查看其说明。
  3. 要添加模块或扩展，请选择您要安装的所有组件。请注意，需要为所有扩展提供付费购买的附加注册代码。
  4. 单击下一步继续。
  5. 根据您为扩展或模块添加的储存库，系统可能会提示您导入储存库的 GPG 密钥，或者要求您同意许可条款。
  6. YaST 软件包管理器将会打开，以安装每个模块的 release 软件包；根据您所选的模块和扩展，它还会安装其他软件包。强烈建议**不要取消选择**系统预先选择的任何软件包；不过，您可以添加其他软件包。
- 依次选择接受和完成以完成该过程。



7. 如果需要，请根据《管理指南》，第 8 章 “安装或去除软件”，第 8.4.2 节 “管理储存库属性” 中所述调整储存库的属性。



## 提示：模块依赖项

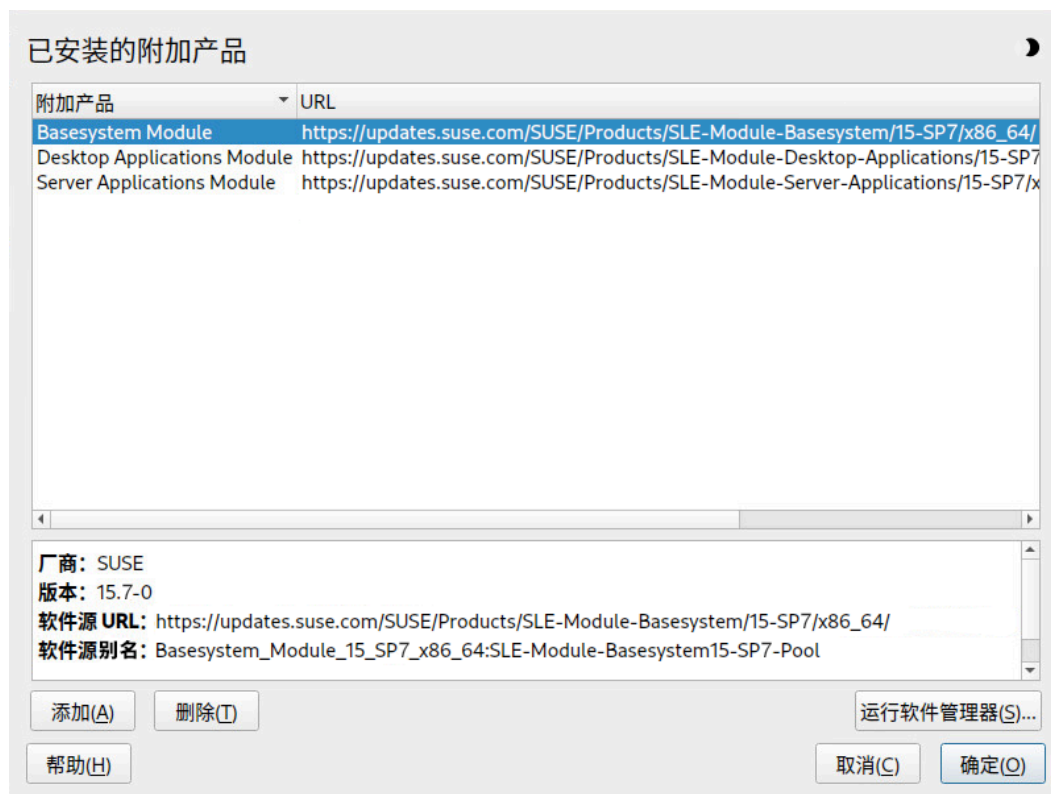
软件包可能需要依赖其他软件包才能正常运行，而模块与此类似，它们也可能依赖于其他模块。如果存在这种情况，系统会自动选择安装所依赖的模块。

## 3.3 从媒体安装扩展和第三方附加产品

从媒体安装扩展或附加产品时，您可以选择各种产品媒体，例如 DVD/CD、可移动大容量存储设备（如闪存盘）、本地目录或 ISO 映像。网络服务器也可以提供媒体，例如，通过 HTTP、FTP、NFS 或 Samba。

1. 启动 YaST，然后选择软件 > 附加产品。或者在命令行中使用 `sudo yast2 add-on` 启动 YaST 附加产品模块。

对话框将显示已安装附加产品、模块和扩展的概览。



2. 单击添加以安装新的附加产品。
3. 在附加产品对话框中，选择与您要从中进行安装的媒体类型匹配的选项：



- 要通过 SLP 在网络中扫描宣告了其服务的安装服务器，请选择使用 SLP 扫描，然后单击下一步。
- 要从可卸媒体添加储存库，请选择相关选项，并在计算机中插入媒体或连接 USB 设备。单击下一步开始安装。
- 对于大多数媒体类型，在选择相应的选项并单击下一步后，系统会提示您指定媒体的路径（或 URL）。可以选择性地指定储存库名称。如果不指定任何储存库名称，YaST 将使用产品的名称或 URL 作为储存库名称。

默认情况下已激活下载储存库描述文件选项。如果停用该选项，YaST 稍后会根据需要自动下载这些文件。

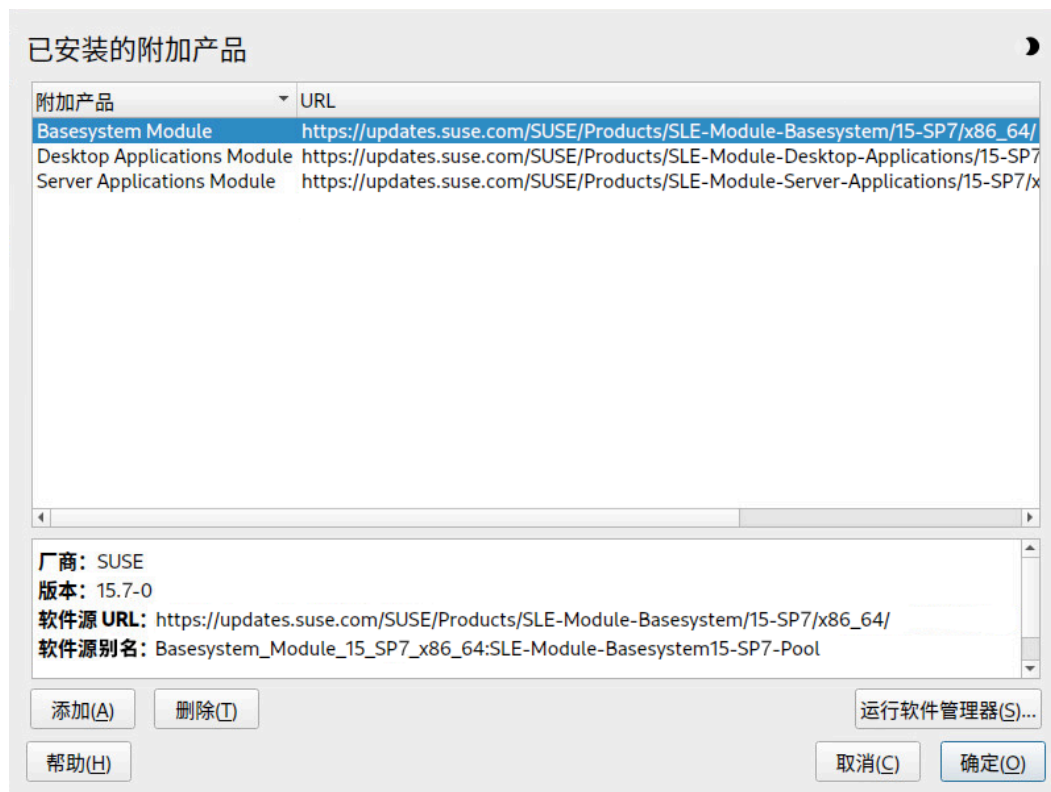
4. 根据您添加的储存库，系统可能会提示您导入储存库的 GPG 密钥，或者要求您同意许可条款。

确认这些消息后，YaST 将下载并分析元数据。它会将储存库添加到已配置储存库列表。

5. 如果需要，请根据《管理指南》，第 8 章 “安装或去除软件”，第 8.4.2 节 “管理储存库属性” 中所述调整储存库的属性。
6. 单击确定确认所做的更改，并关闭配置对话框。
7. 成功添加附加产品媒体的储存库后，软件管理器即会启动，您便可开始安装软件包。有关细节，请参见《管理指南》，第 8 章 “安装或去除软件”。

## 3.4 使用 YaST 删除模块和扩展

1. 启动 YaST > 软件 > 附加产品。



2. 选择应去除的模块或扩展，然后单击删除。当有警告指出将要去除选定组件中的所有软件包时，请确认删除。

3. YaST 软件管理器此时将会打开，并列出已删除的模块或扩展中所有已安装的包。单击接受将这些软件包全部去除。强烈建议您去除不想要的软件包，因为对于已删除的模块或扩展中的软件包，系统不再提供其更新。如果您保留软件包，请务必至少去除每个已删除的模块或扩展的 `*-release` 软件包。

依次单击接受和确定以继续。



### 警告：删除模块

请注意，切勿删除 Basesystem Module。另外，建议不要删除 Server Applications Module。



### 警告：系统不会为来自已删除模块和扩展的软件包提供更新

如果您选择保留已删除模块或扩展中的软件包，将不再会收到这些软件包的更新。因为这些更新包括安全修复，保留此类软件包可能会给系统带来安全风险。

## 3.5 使用 SUSEConnect 添加或删除模块和扩展

1. 运行 `SUSEConnect --list-extensions` 获取可用扩展的概览：

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

Basesystem Module 15 SP7 x86_64 (Activated)
Deactivate with: SUSEConnect -d -p sle-module-basesystem/15.7/x86_64

Containers Module 15 SP7 x86_64
Activate with: SUSEConnect -p sle-module-containers/15.7/x86_64

Desktop Applications Module 15 SP7 x86_64
Activate with: SUSEConnect -p sle-module-desktop-applications/15.7/
x86_64

Development Tools Module 15 SP7 x86_64
```

```

        Activate with: SUSEConnect -p sle-module-development-
tools/15.7/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 SP7 x86_64
        Activate with: SUSEConnect -p sle-we/15.7/x86_64 -r ADDITIONAL
REGCODE

        Python 3 Module 15 SP7 x86_64
        Activate with: SUSEConnect -p sle-module-python3/15.7/x86_64

        SUSE Linux Enterprise Live Patching 15 SP7 x86_64
        Activate with: SUSEConnect -p sle-module-live-patching/15.7/x86_64
-r ADDITIONAL REGCODE

        SUSE Package Hub 15 SP7 x86_64
        Activate with: SUSEConnect -p PackageHub/15.7/x86_64

        Server Applications Module 15 SP7 x86_64 (Activated)
        Deactivate with: SUSEConnect -d -p sle-module-server-
applications/15.7/x86_64

        Legacy Module 15 SP7 x86_64
        Activate with: SUSEConnect -p sle-module-legacy/15.7/x86_64

        Public Cloud Module 15 SP7 x86_64
        Activate with: SUSEConnect -p sle-module-public-cloud/15.7/
x86_64

        SUSE Linux Enterprise High Availability Extension 15 SP7 x86_64
        Activate with: SUSEConnect -p sle-ha/15.7/x86_64 -r ADDITIONAL
REGCODE

        Web and Scripting Module 15 SP7 x86_64

```

```
Activate with: SUSEConnect -p sle-module-web-scripting/15.7/
x86_64

Transactional Server Module 15 SP7 x86_64
Activate with: SUSEConnect -p sle-module-transactional-server/15.7/
x86_64

Certifications Module 15 SP7 x86_64
Activate with: SUSEConnect -p sle-module-certifications/15.7/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. 运行用于激活/停用模块或扩展的命令列表中的命令，以添加或删除组件。请注意，添加扩展需要提供付费购买的附加注册代码。



## 警告：删除模块

请注意，切勿删除 Basesystem Module。另外，建议不要删除 Server Applications Module。



## 重要：不会自动安装或去除软件包

**SUSEConnect** 只会添加或去除模块和扩展。它会注册或取消注册组件，以及启用或禁用组件的储存库，但不会安装或去除任何软件包。如果您希望系统自动完成此类操作，请使用 YaST 来管理模块和扩展。

添加模块或扩展时，**SUSEConnect** 不会安装默认软件包或软件集。要手动执行此操作，请使用 Zypper 或 YaST > 软件管理。

删除模块或扩展时，**SUSEConnect** 不会执行清理。模块或扩展中的软件包仍会安装在系统上，但不再从储存库更新。要列出这些“孤立的”软件包，请运行 **zypper packages --orphaned**。要去除一个或多个软件包，请运行 **zypper remove PACKAGE [ANOTHER\_PACKAGE]**。或者，可以使用 YaST > 软件管理，然后使用查看 > 软件包分类 > 孤立的包列出和删除孤立的软件包。



### 警告：系统不会为来自已删除模块和扩展的软件包提供更新

如果您选择保留已删除模块或扩展中的软件包，将不再会收到这些软件包的更新。因为这些更新包括安全修复，保留此类软件包可能会给系统带来安全风险。

## 4 软件包的模块成员资格

默认情况下，用于搜索软件包的工具（YaST 软件管理或 **zypper search**）被限制为仅可在已激活的储存库中搜索。要将搜索范围扩展到尚未激活的远程储存库，您可以运行以下命令：

```
zypper search-packages PACKAGE
```



### 提示：在 SUSE Customer Center 中搜索软件包

您还可以在 SUSE Customer Center Web 界面（网址为 <https://scc.suse.com/packages>）中搜索软件包及其相应模块。此服务不需要登录 SUSE。

**zypper search-packages** 提供了以下选项供您细化搜索结果：

**-x、--match-exact**

搜索完全匹配项。

**-g、--group-by-module**

按模块而非软件包名称对搜索结果分组。

**-d、--details**

同时列出版本号和包含该软件包的储存库。

`--xmlout`

生成 XML 输出。

下面是如何使用 **zypper search-packages** 的一些示例。

#### 例 1：简单搜索

下面的命令会搜索软件包 `nodejs` 和 `hawk`。第一个软件包在 `Web and Scripting` 模块中提供，第二个软件包属于 SUSE Linux Enterprise High Availability 的一部分。这两个软件包都尚未安装：

```
> 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
[...]

```

#### 例 2：搜索完全匹配项

如果您知道确切的软件包名称，则可以使用选项 `-x` 将搜索结果缩小到完全匹配的软件包：

```
> 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

```



[...]

### 例 3：搜索已安装或提供的软件包

如果您要搜索的软件包已安装或在您系统上可用的某个模块中提供，搜索结果会有所不同。下面的示例中已安装软件包 vim，未安装软件包 emacs，但您无需添加模块就可安装它。

```
> 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
```

如果不搜索软件包，您还可以查看属于某个模块或扩展的软件包列表。启动 YaST 软件管理模块，然后单击查看 > 服务。选择一项以显示属于此模块或扩展的软件包列表。

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