

## SUSE Linux Enterprise Server 15 SP3

# 模块和扩展快速入门

## SUSE Linux Enterprise Server 15SP3

本快速入门提供了 SUSE Linux Enterprise 系列可用模块和扩展的概述。您可以了解它们的用途和功能，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 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。它们都可以使用 YaST 或命令行工具

**SUSEConnect** 进行管理。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删除模块。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就是生命周期。SUSE 为模块所提供的几乎所有软件包都提供 L3 支持（SUSE Package Hub 模块除外）。有关 SUSE Linux Enterprise Server 支持声明的详细信息，请参见[发行说明 \(https://www.suse.com/releases/notes/x86\\_64/SUSE-SLES/15-SP3/#intro-support\)](https://www.suse.com/releases/notes/x86_64/SUSE-SLES/15-SP3/#intro-support)。

## 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/releases/notes> 上通常会提供各扩展的发行说明。

## 2 SUSE Linux Enterprise 产品系列的模块

SUSE Linux Enterprise 产品系列中提供下列模块。请注意，模块的可用性取决于产品（请参考可用性这列）。有关生命周期、发布频率和覆盖支持期的详细信息，请参见 <https://www.suse.com/lifecycle>。



### 注意：L3 支持

对于模块中的软件包，一般提供 L3 支持，但 PackageHub 和第三方模块例外。使用 `zypper info PACKAGE` 命令可检查针对特定软件包的支持级别。

名称	依赖的模块	可用性	支持
	内容		
<b>Basesystem</b>	无	默认所有产品上均提供	<b>生命周期：</b> 10 年 <b>延长期：</b> 3 年 LTSS
	在安装程序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 <u>精简</u> 系统安装模式。系统默认已选择安装此模块，不应将其取消选择。		
<b>Certifications</b>	Basesystem	除 SLED 以外的所有产品	<b>生命周期：</b> 持续到下一个 SP 发布 <b>延长期：</b> 3 年 LTSS
	包含 FIPS 140-2 认证软件包。 您的 SUSE Linux Enterprise 订阅中已包含对 Certifications 模块的访问权限。		

名称	依赖的模块	可用性	支持
	内容		
<b>Containers</b>	Basesystem	SLES、SLES-SAP、SLE-HPC	<b>生命周期：</b> 10 年 <b>延长期：</b> 无
	包含容器的支持、工具和映像。		
<b>Desktop Applications</b>	Basesystem	SLED（默认）、SLE-WE（默认）、SLES、SLES-SAP、SLE-RT（默认）、SLE-HPC	<b>生命周期：</b> 10 年 <b>延长期：</b> 无
	向系统添加图形用户界面和最基本的桌面应用程序。		
<b>Development Tools</b>	Basesystem、Desktop Applications	SLES、SLES-SAP、SLED、SLE-RT（默认）、SLE-HPC	<b>生命周期：</b> 10 年 <b>延长期：</b> 3 年 LTSS
	包含编译器（包括 <code>gcc</code> ）以及编译和调试应用程序所需的库。取代了以前的 Software Development Kit (SDK)。		
<b>High Availability</b>	Basesystem	SLES、SLES-SAP（已包含）、SLE-HPC	<b>生命周期：</b> 10 年 <b>延长期：</b> 3 年 LTSS
	添加了针对任务关键型设置的群集支持。随附的工具包括 Hawk、crm、Pacemaker 和 Corosync。SLES-SAP 的订阅中包含高可用性支持，因此 High Availability 可作为这些产品上的模块使用。它还可用作 SLES 和 SLE-HPC 的扩展（参见下文）。		
<b>High Performance Computing</b>	Basesystem	SLE-HPC（已包含）	<b>生命周期：</b> 10 年

名称	依赖的模块	可用性	支持
	内容		
			<b>延长期：3 年</b> LTSS 、21 年 ESPOS
	包含与高性能计算 (HPC) 相关的工具和库。		
<b>Legacy</b>	Basesystem、 Server Applications	SLES、 SLES-SAP、 SLE-HPC	
	<p>通过提供 SUSE Linux Enterprise 中已停产的软件包，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 SP3。根据迁移要求和配置的复杂性级别选择此模块中的软件包。</p> <p>从旧版产品迁移时，建议使用此模块。</p>		
<b>NVIDIA Compute</b>	Basesystem	AMD64/Intel 64 和 AArch64 上的 SLES 与 SLE-HPC	此模块中的软件由 NVIDIA 提供，SUSE 并不提供相关支持
	<p>包含 NVIDIA CUDA (Compute Unified Device Architecture, 统一计算设备架构) 驱动程序。</p> <p>此模块中的软件由 NVIDIA 根据 <a href="http://docs.nvidia.com/cuda/eula/">CUDA 最终用户许可协议 (http://docs.nvidia.com/cuda/eula/)</a> 提供，不受 SUSE 支持。</p>		

名称	依赖的模块	可用性	支持
	内容		
	<p><b>!</b> <b>重要：不要使用 SUSEConnect 来添加此模块</b></p> <p>不要尝试使用 <u>SUSEConnect</u> CLI 工具添加此模块。<u>SUSEConnect</u> 无法处理第三方储存库。</p> <p>在安装期间，请从扩展和模块选择屏幕中选择该模块。在已安装的系统中运行 <b>yast registration</b>，依次选择选择扩展、<u>NVIDIA Compute 模块</u>，然后选择下一步继续。校验并接受 NVIDIA 储存库 GPG 密钥。</p> <p><b>!</b> <b>重要：不支持将 Workstation Extension 和 NVIDIA Compute 模块结合使用</b></p> <p><u>Workstation Extension</u> 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 <u>NVIDIA Compute 模块</u> 和 <u>Workstation Extension</u>。</p>		
<b>Public Cloud</b>	Basesystem、Server Applications	SLES、SLES-SAP、SLE-HPC	
	包含为在云环境中部署 SUSE Linux Enterprise Server 而创建映像所需的全部工具。例如：Amazon Web Services (AWS)、Microsoft Azure、Google Compute Platform 或 SUSE OpenStack Cloud。		

名称	依赖的模块	可用性	支持
	内容		
<b>Python 2</b>	Basesystem	SLES、SLES-SAP、SLE-HPC、SLED	
	<p>SUSE Linux Enterprise Server 15 SP3 使用 Python 版本 3。此模块包含 Python 2 运行时与模块。</p> <p>您的 SUSE Linux Enterprise 订阅中已包含对 Python 2 模块的访问权限。</p>		
<b>Real Time</b>	Basesystem、Desktop SLE-RT（已包含） Applications、Development Tools、Server Applications		
	<p>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。</p> <p>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。</p>		
<b>SAP Applications</b>	Basesystem	SLES-SAP（已包含）	<b>生命周期：</b> 10 年 <b>延长期：</b> 3.5 年 LTSS 、21.5 年 ESPOS
	包含特定于 SLES-SAP 的软件包。		
<b>Server Applications</b>	Basesystem	SLES（默认）、SLES-SAP、SLE-RT（默认）、SLE-HPC	<b>生命周期：</b> 10 年 <b>延长期：</b> 3 年 LTSS

名称	依赖的模块	可用性	支持
	内容		
	通过提供 DHCP 服务器、名称服务器或 Web 服务器等网络服务来添加服务器功能。系统默认已选择安装此模块；不建议将其取消选择。		
<b>SUSE Cloud Application Platform Tools</b>	Basesystem	SLED、SLES、SLES-SAP	
	添加用来与 SUSE Cloud Application Platform 产品交互的工具。		
<b>SUSE Package Hub</b>	Basesystem	所有产品	<b>生命周期：无 延长期：无 级别：无</b>
	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 <a href="https://packagehub.suse.com/">https://packagehub.suse.com/</a> 。		
<b>Transactional Server</b>	Basesystem	SLES	
	<p>事务更新通过以“原子”方式整体更新操作系统及其软件包的方法来提供 SUSE Linux Enterprise 系统。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。这样会使系统回到先前的正常运行状态。</p> <p>您的 SUSE Linux Enterprise Server 订阅中已包含对 Transactional Server 模块的访问权限。</p>		
<b>Web and Scripting</b>	Basesystem、Server Applications	SLES、SLES-SAP、SLE-HPC	



名称	依赖的模块	可用性	支持
	内容		
	包含用于运行中 Web 服务器的软件包。		




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LTSS: 长期服务包支持 (<https://www.suse.com/products/long-term-service-pack-support/>) 

ESPOS: 延期的服务包覆盖支持

### 3 SUSE Linux Enterprise 产品系列的扩展

SUSE Linux Enterprise 产品系列中提供下列扩展。请注意，扩展的可用性取决于产品（请参考可用性这列）。

名称和内容	模块依赖项	可用性
SUSE Linux Enterprise High Availability Extension ( <a href="https://www.suse.com/products/highavailability/">https://www.suse.com/products/highavailability/</a> ) 	Basesystem、Server Applications	SLES
SUSE Linux Enterprise Live Patching ( <a href="https://www.suse.com/products/live-patching/">https://www.suse.com/products/live-patching/</a> ) 	Basesystem	SLES
SUSE Linux Enterprise Workstation Extension ( <a href="https://www.suse.com/products/workstation-extension/">https://www.suse.com/products/workstation-extension/</a> ) 	Basesystem、Desktop Applications	SLES、SLED（默认）

### 4 安装和管理

在初始设置系统时以及在现有的 SUSE Linux Enterprise Server 安装上可安装模块和扩展。

## 4.1 在初始系统设置期间安装模块和扩展

在设置系统时可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 Manager \(https://www.suse.com/products/suse-manager/\)](https://www.suse.com/products/suse-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 8 章“安装步骤”，第 8.8 节“扩展和模块选择”。

## 4.2 从正在运行的系统上安装和管理模块与扩展

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 9 章“注册 SUSE Linux Enterprise 和管理模块/扩展”，第 9.3 节“从安装的系统注册”中的相关说明。

注册系统后，便可添加或删除模块。有关细节，请参考《部署指南》，第 9 章“注册 SUSE Linux Enterprise 和管理模块/扩展”，第 9.4 节“在正在运行的系统中管理模块和扩展”。

# 5 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 `zypper search-packages`。要了解某个软件包所属的模块，请运行

```
zypper search-packages PACKAGE
```

如果 `search-packages` 子命令在您的系统上不可用，请安装软件包 `zypper-search-packages-plugin`。



### 提示：在 SUSE Customer Center 中搜索软件包

为防止 Zypper 的软件包搜索命令在您的系统上不可用，您还可以使用 SUSE Customer Center Web 界面（软件包搜索）来检查软件包及其相应模块的可用性。要执行此操作，请访问 <https://scc.suse.com/packages>。此服务不需要登录 SUSE。

**zypper search-packages** 提供了以下选项供您调整搜索结果：

**-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 Extension 的一部分。这两个软件包都尚未安装：

```
tux > zypper search-packages openjdk nodejs
Following packages were found in following modules:

Package           Module or Repository
-----
java-10-openjdk   Legacy Module (sle-module-legacy/15.2/x86_64)
                  SUSEConnect --product sle-module-legacy/15.2/x86_64
java-11-openjdk   Basesystem Module (sle-module-basesystem/15.2/x86_64)
                  SUSEConnect --product sle-module-basesystem/15.2/x86_64

nodejs10          Web and Scripting Module (sle-module-web-scripting/15.2/x86_64)
                  SUSEConnect --product sle-module-web-scripting/15.2/x86_64
nodejs12          Web and Scripting Module (sle-module-web-scripting/15.2/x86_64)
                  SUSEConnect --product sle-module-web-scripting/15.2/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：

```
tux > zypper search-packages -x java-11-openjdk nodejs12
Following packages were found in following modules:

Package      Module or Repository
-----
java-11-openjdk  Basesystem Module (sle-module-basesystem/15.2/x86_64)

                SUSEConnect --product sle-module-basesystem/15.2/x86_64
nodejs12       Web and Scripting Module (sle-module-web-scripting/15.2/x86_64)

                SUSEConnect --product sle-module-web-scripting/15.2/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。在下面的示例中，软件包 `vim` 已安装。软件包 `emacs` 未安装，但不必添加模块就可进行安装。

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

Package  Module or Repository
-----
vim      Basesystem Module (sle-module-basesystem/15/x86_64)
vim      Installed
vim      Available

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

Package  Module or Repository
-----
emacs    Basesystem Module (sle-module-basesystem/15/x86_64)
emacs    Available

```

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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