SUSE

适配 SUSE Linux Enterprise 16

SUSE Linux Enterprise 15 和 16 的主要区别

内容

本文介绍了 SLE 15 和 16 的主要区别。

原因

本文将帮助您评估升级到 SLE 16 的可行性。

工作量

读完本文大约需要 10 分钟。

目标

了解如何以最佳方式采用 SLE 16。

出版日期：2025 年 12 月 11 日

目录

1 最低 CPU 体系结构支持

	AMD64/Intel 64 (x86-64)	IBM POWER (ppc64le)	IBM Z (s390x)	Arm (AArch64)
SLES 15	x86-64-v1	POWER8	z12	ARMv8.0-A
SLES 16	x86-64-v2[1、2]	POWER10[3]	z14	ARMv8.0-A

[1] 为提升整体性能，SLES 16 还提供了一些针对 x86-64-v3 优化的共享库。在支持 v3 的系统上，这些库会自动安装并启用。如果软件包名称中包含字符串 x86_42_v3，则表明该软件包已进行优化。

[2] SLES 16 去除了对 32 位应用程序的支持。不过，通过从 SUSE Package Hub 安装 `grub2-compat-ia32` 软件包，Linux 内核仍可实现 32 位系统调用。

[3] SLES 16 可在 Power9 上运行，但 SUSE 仅为 Power10 及更高版本提供技术支持。

2 版本控制和发布周期

- SLE 15 使用服务包 (SP) 进行年度更新，例如 SP1、SP2、SP3、SP4、SP5、SP6 和 SP7，SP7 是 SLE 15 的最后一个服务包。

- SLE 16 引入了新的版本命名规则，采用 16.0、16.1 这类次要版本号，而非服务包。计划每年发布一次版本，且均在 11 月发布。初始版本 16.0 计划于 2025 年 11 月发布。

3 生命周期

- SUSE Linux Enterprise Server 15 的每个服务包通常提供 1.5 年的常规支持（部分情况除外），并提供多种扩展支持选项，如 LTSS (Long Term Service Pack Support) 和 ESPOS (Extended Service Pack Overlap Support)。SLE 15 的总支持期限最长可达 13 年（10 年

常规支持 + 3 年 LTSS）。其中，SLES 15 SP7 的常规支持持续至 2031 年 7 月 31 日，LTSS 支持持续至 2034 年 7 月 31 日，LTSS Core 支持持续至 2037 年 12 月 31 日。SUSE Linux Enterprise Server for SAP Applications 15 各服务包的总支持期限为 4.5 年。

- SLES 16 可支持 2038 年以后的未来场景。其常规支持预计于 2035 年 11 月结束，LTSS 和 Extreme LTSS 支持则可延续至 2040 年以后。SUSE Linux Enterprise Server for SAP Applications 16 提供 1.5 年常规支持，外加 3 年扩展支持。

4 系统管理

- 在 SLE 15 及更早版本中，使用 YaST 进行安装、配置和系统管理。无人值守和脚本化安装通过 AutoYaST 实现。

- SLE 16 的系统管理发生了重大变化：

  - 安装（包括无人值守安装）迁移至 Agama。Agama 是一款全新的安装程序，具备 Web 前端界面、命令行界面和用于集成的 API。其核心专注于安装过程，而非软件配置管理 (SCM) 工具，且支持重复导入配置。

  - 配置管理通过 SUSE Multi-Linux Manager 采用 Salt 和 Ansible，为客户提供可直接运行的自动化功能。

  - 远程管理由 Cockpit 负责，这是一款用于一对一管理的 Web 前端工具。

SLE 16 中的这些变化旨在实现与 Salt 和 Ansible 的更好集成，支持通过 Web 浏览器进行远程安装，并提供多种界面（Web、命令行界面、HTTP API）来控制相关流程。

5 安全框架

- SLE 15 默认使用 AppArmor，虽提供 SELinux，但未附带相关策略。

- SLE 16 默认提供附带策略的 SELinux，涵盖 400 多个模块，几乎可对整个系统进行限制。如果需要，系统的部分组件也可在无限制模式下运行。SUSE Linux Enterprise Server for SAP Applications 16 通过 SELinux 增强了工作负载隔离能力，可对数据、数据流及容器实现隔离。

6 网络堆栈

- SLE 15 使用 wicked 和 NetworkManager。

- SLE 16 则专注于单一网络堆栈，仅使用 NetworkManager。

7 部署

- SLE 15 提供适用于虚拟机或公有云、可直接运行的映像，以及安装媒体 - 可通过 YaST 手动部署，或通过 AutoYaST 自动部署。它使用特殊的安装环境，配置由 `linuxrc` 驱动。AutoYaST 配置文件仅能导入一次。

- SLE 16 同样提供适用于虚拟机或公有云、可直接运行的映像，并通过 Agama 实现手动/自动部署。Agama 安装程序可通过 Web 界面、命令行或 HTTP API 访问，且支持重复导入配置。它采用包含 `dracut`、`systemd` 和 NetworkManager 的标准实时媒体，并提供包含精选 `linuxrc` 选项的向后兼容层。

8 Init 系统

- SLE 15 采用 `systemd`，支持原生系统单元，并兼容第三方 SysV init 脚本。

- SLE 16 完成了从 SysV init 的过渡，仅使用 `systemd` 原生系统单元。

9 默认操作系统配置

- 在 SLE 15 中，操作系统的默认配置主要存储在 `/etc` 目录下。

- 在 SLE 16 中，默认配置存储在 `/usr` 目录下，`/etc` 目录仅用于存储自定义配置。这种将供应商提供的默认配置与管理员自定义配置分离的方式，不仅让系统更新更便捷，还支持将 `/usr` 文件系统设置为只读模式（可选）。

10 /tmp 使用 tmpfs

- 在 SLE 15 中，`/tmp` 是常规文件夹或分区。如果默认配置以 Btrfs 作为根文件系统，该目录则为 Btrfs 子卷。

- 在 SLE 16 中，`/tmp` 使用 `tmpfs` 文件系统。该文件系统将数据存储在物理 RAM 和/或交换空间中，因此读写操作速度极快。

  > **❗ 重要：/tmp 不再具备持久性**
  >
  > 在 `tmpfs` 中，`/tmp` 的内容在系统重引导后不会保留。如果您的应用程序会向 `/tmp` 写入需要持久化的数据，请调整应用程序，改用其他位置（如 `/var/cache`）存储此类数据。

  > **❗ 重要：不要过度分配 /tmp 的大小**
  >
  > 如果为 `tmpfs` 文件系统实例分配的大小超过系统物理 RAM 与交换空间的总和，可能会导致系统死锁 - 因可用内存不足，系统将陷入无响应状态。

11 桌面环境

- SLE 15 使用 GNOME 作为默认桌面环境。SUSE Linux Enterprise Desktop 和 SUSE Linux Enterprise Workstation Extension 共享桌面工作效率工具。

- SLE 16 采用精简版 GNOME 桌面，有助于缩小安全攻击面。此外，16.0 版本暂不计划推出 SUSE Linux Enterprise Desktop。

12 现代化的 High Availability 堆栈

	SLE HA 15	SLE HA 16
Pacemaker	版本 2	版本 3

	SLE HA 15	SLE HA 16
Corosync	版本 2	版本 3
分布式文件系统	OCFS2、GFS2（只读模式）	GFS2（完全支持）
屏蔽代理	所有代理包含在单个软件包中	代理单独打包

13 已去除的技术

为减小操作系统体积以及安全攻击面，SLE 16 去除了部分技术：

- 系统：去除了对 32 位应用程序的支持。不过，通过从 SUSE Package Hub 安装 `grub2-compat-ia32` 软件包，Linux 内核仍可实现 32 位系统调用。

- 系统：去除 SysV init 脚本，改用原生 `systemd` 单元。

- 网络：去除了 `wicked`，改用 NetworkManager。

- 网络：不再使用 NIS；改用 LDAP。

- 网络：去除了 ISC DHCP 服务器，改用更现代的 Kea DHCP。

- 适用于 Linux 的 Windows 子系统 (WSL)：去除了对 WSL1 的支持，改用 WSL2。WSL2 提供完整的 Linux 内核，具备全面的系统调用兼容性。

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