

Einführung von SUSE Linux Enterprise 16

Wesentliche Unterschiede zwischen SUSE Linux Enterprise 15 und 16

WAS?

Dieser Artikel beschreibt die wesentlichen Unterschiede zwischen SLE 15 und 16.

WARUM?

Dieser Artikel hilft Ihnen bei der Bewertung eines Upgrades auf SLE 16.

AUFWAND

Etwa 10 Minuten Lesedauer.

ZIEL

Ein Verständnis davon wie Sie SLE 16 am besten einführen können.

Veröffentlicht: 11.12.2025

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1 Unterstützte minimale CPU-Architektur

	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 Um die Gesamtleistung zu verbessern, bietet SLES 16 auch einige gemeinsam genutzte Bibliotheken, die für x86-64-v3 optimiert sind. Diese Bibliotheken werden auf Systemen, die v3 unterstützen, automatisch installiert und verwendet. Sie können erkennen, dass ein Paket optimiert wurde, wenn sein Name die Zeichenfolge `x86_42_v3` enthält.

² In SLES 16 wurde die Unterstützung von 32-Bit-Anwendungen entfernt. Der Linux-Kernel kann weiterhin 32-Bit-Systemaufrufe ermöglichen, indem das `grub2-compat-ia32`-Paket aus dem SUSE Package Hub installiert wird.

³ SLES 16 kann unter Power9 ausgeführt werden, aber SUSE unterstützt nur Power10 und höher.

2 Versionierung und Release-Zyklus

- SLE 15 verwendet Service Packs (SPs) für jährliche Updates, beispielsweise SP1, SP2, SP3, SP4, SP5, SP6 und SP7, welches das letzte SP ist, das für SLE 15 veröffentlicht wurde.
- SLE 16 führt ein neues Benennungsschema für Versionen ein, das Unterversionen wie 16.0, 16.1 anstelle von SPs verwendet. Die Veröffentlichungen sind jährlich im November geplant. Die anfängliche Veröffentlichung von 16.0 ist für November 2025 geplant.

3 Lebenszyklus

- SUSE Linux Enterprise Server 15 erhält allgemeinen Support für 1,5 Jahre pro Service Pack (mit Ausnahmen) und bietet verschiedene erweiterte Supportoptionen wie LTSS (Langfristiger Service Pack-Support) und ESPOS (Erweiterte Unterstützung für Service Pack-Über-

schneidungen). SLE 15 erhält insgesamt für bis zu 13 Jahre Support (10 Jahre allgemeiner Support + 3 Jahre LTSS). SLES 15 SP7 erhält bis 31. Juli 2031 allgemeinen Support, wobei LTSS bis 31. Juli 2034 und LTSS Core bis 31. Dezember 2037 unterstützt wird. SPs von SUSE Linux Enterprise Server für SAP-Anwendungen 15 erhalten insgesamt 4,5 Jahre lang Support.

- SLES 16 ist bereit für die Zukunft bis jenseits von 2038. Der allgemeine Support endet voraussichtlich im November 2035, LTSS und Extreme LTSS werden über 2040 hinaus unterstützt. SUSE Linux Enterprise Server für SAP-Anwendungen 16 erhält für 1,5 Jahre allgemeinen Support plus 3 Jahre erweiterten Support.

4 Systemmanagement

- In SLE 15 und früher wurde YaST für Installation, Konfiguration und Systemmanagement verwendet. Die unbeaufsichtigte Installation auf Basis eines Skripts wurde von AutoYaST durchgeführt.
- In SLE 16 ändert sich das Systemmanagement erheblich:
 - Die Installation (einschließlich der unbeaufsichtigten Variante) wechselt zu Agama. Agama ist ein neues Installationsprogramm mit webbasiertem Front-End, Befehlszeilenschnittstelle und API für die Integration. Der Fokus liegt auf der Installation zugunsten von Tools für das Software-Konfigurationsmanagement (SCM-Tools). Agama unterstützt den wiederholten Import von Konfigurationen.
 - Für das Konfigurationsmanagement werden Salt und Ansible über SUSE Multi-Linux Manager verwendet. Dies unterstützt Kunden bei der betriebsbereiten Automatisierung.
 - Das Remotemanagement erfolgt über Cockpit, ein webbasiertes Front-End für die 1:1-Verwaltung.

Diese Änderungen in SLE 16 zielen darauf ab, eine bessere Integration mit Salt und Ansible sowie die Remoteinstallation über einen Webbrowser zu ermöglichen und verschiedene Schnittstellen (Web, Befehlszeilenschnittstelle, HTTP-API) zur Steuerung des Prozesses anzubieten.

5 Sicherheitsstruktur

- SLE 15 verwendet standardmäßig AppArmor. SELinux wird ohne Richtlinien ausgeliefert.
- SLE 16 liefert SELinux standardmäßig mit Richtlinien für über 400 Module aus, was fast das gesamte System einschränkt. Teile des Systems können auf Wunsch uneingeschränkt ausgeführt werden. SUSE Linux Enterprise Server für SAP-Anwendungen 16 hat die Workload-Isolation mit SELinux verbessert und kann Daten und Datenflüsse sowie Container isolieren.

6 Netzwerk-Stack

- SLE 15 verwendete wicked und NetworkManager.
- SLE 16 legt den Fokus auf einen einzelnen Stack mit NetworkManager.

7 Bereitstellung

- SLE 15 bot betriebsbereite Images für virtuelle Maschinen oder Public Clouds und Installationsmedien für die manuelle Bereitstellung mit YaST oder die automatisierte Bereitstellung mit AutoYaST. Es verwendete eine spezielle Installationsumgebung mit linuxrc-gestützter Konfiguration. Der AutoYaST-Profilimport war nur eine einmalige Aufgabe.
- SLE 16 verwendet betriebsbereite Images für virtuelle Maschinen oder Public Clouds sowie die manuelle/automatische Bereitstellung mit Agama. Das Agama-Installationsprogramm ist über eine Webschnittstelle, Befehlszeile oder HTTP-API erreichbar. Agama unterstützt den wiederholten Import von Konfigurationen. Es verwendet ein Standard-Live-Medium mit dracut, systemd und NetworkManager und bietet eine Abwärtskompatibilitätsebene mit ausgewählten Optionen für linuxrc.

8 Init-System

- SLE 15 hat systemd mit nativen Units und Kompatibilität für SysV-Init-Skripte von Drittanbietern verwendet.
- In SLE 16 wird der Wechsel von SysV-init abgeschlossen und es werden ausschließlich native systemd-Units verwendet.

9 Standardkonfiguration des Betriebssystems

- In SLE 15 lag die Standard-Betriebssystemkonfiguration hauptsächlich in /etc.
- In SLE 16 liegen die Standardwerte in /usr und /etc dient der Anpassung. Diese Trennung von herstellerseitigen Standardeinstellungen und Administratoranpassung ermöglicht einfachere Updates und – optional – ein schreibgeschütztes /usr-Dateisystem.

10 /tmp verwendet tmpfs

- In SLE 15 war /tmp ein normaler Ordner oder eine normale Partition. In der Standardkonfiguration mit Btrfs als Root-Dateisystem handelte es sich um ein Btrfs-Subvolume.
- In SLE 16 verwendet /tmp das tmpfs-Dateisystem, das Daten im physischen RAM und/oder Swap-Speicher speichert und somit sehr schnell für Lese- und Schreibvorgänge ist.



Wichtig: /tmp ist nicht mehr permanent

Bei tmpfs ist der Inhalt von /tmp zwischen Neustarts nicht mehr permanent. Wenn Sie über Anwendungen verfügen, die permanente Daten in /tmp schreiben, übernehmen Sie sie, um einen anderen Speicherort zu verwenden, z. B. /var/cache.



Wichtig: Kein Überdimensionieren von /tmp

Das Überdimensionieren von tmpfs-Dateisysteminstanzen, die über die Summe des physischen RAM und des Swap-Speichers eines Systems hinausgehen, können zu Deadlock-Situationen führen, in denen das System aufgrund von nicht genügend verfügbarem Speicher nicht mehr reagiert.

11 Desktop-Umgebung

- SLE 15 verwendete GNOME als Standard-Desktop-Umgebung. SUSE Linux Enterprise Desktop und SUSE Linux Enterprise Workstation Extension verwendeten die gleichen Desktop-Produktivitätstools.
- SLE 16 verwendet einen minimalen GNOME-Desktop. Dies hilft, die sicherheitsrelevante Angriffsfläche zu minimieren. SUSE Linux Enterprise Desktop ist für 16.0 nicht geplant.

12 Modernisierter High Availability-Stapel:

	SLE HA 15	SLE HA 16
Pacemaker	Version 2	Version 3
Corosync	Version 2	Version 3
Verteiltes Dateisystem	OCFS2, GFS2 (schreibgeschützt)	GFS2 (vollständig unterstützt)
Fencing-Agenten	Alle Agenten in einem einzigen Paket	Separat gepackte Agenten

13 Entfernte Technologien

SLE 16 entfernt bestimmte Technologien, um den Fußabdruck des Betriebssystems und die sicherheitsrelevanten Angriffsvektoren zu reduzieren:

- System: Die Unterstützung von 32-Bit-Anwendungen wurde entfernt. Der Linux-Kernel kann weiterhin 32-Bit-Systemaufrufe ermöglichen, indem das grub2-compat-ia32-Paket aus dem SUSE Package Hub installiert wird.
- System: SysV-Init-Skripte werden entfernt; verwenden Sie stattdessen native systemd-Units.
- Netzwerk: wicked wird zugunsten von NetworkManager entfernt.

- Netzwerk: NIS wird nicht mehr verwendet; wählen Sie stattdessen LDAP aus.
- Netzwerk: Der ISC DHCP-Server wurde zugunsten des moderneren Kea DHCP entfernt.
- Windows-Subsystem für Linux: Die Unterstützung für WSL1 wurde zugunsten von WSL2 entfernt, was einen vollständigen Linux-Kernel mit kompletter Kompatibilität mit Systemaufrufen bietet.

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