SUSE

SUSE Linux Enterprise Real Time 15 SP6

Release Notes

SUSE Linux Enterprise Real Time is an integrated suite of robust open source real-time technologies that enable enterprises to implement solutions with controlled response times. This document gives an overview of features of SUSE Linux Enterprise Real Time and their limitations.

These release notes will be updated periodically, and the latest version of these release notes is always available at https://www.suse.com/releasenotes ↗ .

General documentation can be found at https://documentation.suse.com/sle-rt/15-SP6/ ↗ .

Contents

1 About the release notes

These Release Notes are identical across all architectures, and the most recent version is always available online at https://www.suse.com/releasenotes ↗.

Entries are only listed once but they can be referenced in several places if they are important and belong to more than one section.

Release notes usually only list changes that happened between two subsequent releases. Certain important entries from the release notes of previous product versions are repeated. To make these entries easier to identify, they contain a note to that effect.

However, repeated entries are provided as a courtesy only. Therefore, if you are skipping one or more service packs, check the release notes of the skipped service packs as well. If you are only reading the release notes of the current release, you could miss important changes.

2 SUSE Linux Enterprise Real Time

SUSE Linux Enterprise Real Time is an integrated suite of robust open source real-time technologies that enable enterprises to implement solutions with controlled response times. SUSE Linux Enterprise Real Time enables usage of SUSE Linux Enterprise Server based technologies in environments where having control over latencies is a critical requirement. Its open source license minimizes the risk of vendor lock-in, and its adherence to open standards encourages interoperability with industry standard tools and technologies.

2.1 What is new?

SUSE Linux Enterprise Real Time 15 SP6 introduces changes compared to SUSE Linux Enterprise Real Time SP5. The most important changes are listed below:

- The kernel has inherited hardware enablement and part of new features of SUSE Linux Enterprise Server 15 SP6 kernel.

- The latest stable 6.4 `PREEMPT_RT` has been incorporated into the service pack.

- Certifications Module and Containers Module have been enabled and become an option in SUSE Linux Enterprise Real Time 15 SP6.

- Live Patching Extension has been enabled and become an option in SUSE Linux Enterprise Real Time 15 SP6.

- Package Hub Module has been enabled and become an option in SUSE Linux Enterprise Real Time 15 SP6.

- `LTTng` tools package has been updated to version 2.13.11 and moved to the Development Tools Module 15 SP6. SUSE Linux Enterprise Real Time 15 SP6 carries kernel module packages needed for operation of `LTTng`, and `LTTng` Userspace Tracing has been fully enabled in the product.

- Support for Precision Time Protocol version 2 continues to be available through the base SUSE Linux Enterprise Server 15 SP6 product.

- `RT-Tests` suite has been updated to version 2.5, and contains programs to test various real time Linux features.

- `Cpuset` has been updated to version 1.6.1. It allows manipulation of cpusets on the system and provides higher level functions such as implementation and control of a basic CPU shielding setup.

- Previously, SUSE Linux Enterprise Real Time only disabled lower C-states in the kernel config. However, starting from SUSE Linux Enterprise Real Time 15 SP6 all C-states are now disabled.

2.1.1 Enriched system visibility in the SUSE Customer Center (SCC)

SUSE is committed to helping provide better insights into the consumption of SUSE subscriptions regardless of where they are running or how they are managed; physical or virtual, on-prem or in the cloud, connected to SCC or Repository Mirroring Tool (RMT), or managed by SUSE Manager. To help you identify or filter out systems in SCC that are no longer running or decommissioned, SUSEConnect now features a daily "ping", which will update system information automatically.

For more details see the documentation at https://documentation.suse.com/subscription/susec-onnect/single-html/SLE-suseconnect-visibility/ ↗.

2.2 Hardware Platform Support

SUSE Linux Enterprise Real Time 15 SP6 only supports Intel 64/AMD64 (x86-64) platform.

2.3 Technology Previews

Technology previews are packages, stacks, or features delivered by SUSE which are not supported. They may be functionally incomplete, unstable or in other ways not suitable for production use. They are included for your convenience and give you a chance to test new technologies within an enterprise environment.

Whether a technology preview becomes a fully supported technology later depends on customer and market feedback. Technology previews can be dropped at any time and SUSE does not commit to providing a supported version of such technologies in the future.

Give your SUSE representative feedback about technology previews, including your experience and use case.

2.3.1 Technology Previews for scheduling

- SUSE Linux Enterprise Real Time 15 SP6 enables the `SCHED_DEADLINE` scheduling class as a Technology Preview (best-effort support). This scheduler predicts task scheduling based on application deadlines, which is particularly useful for realtime workload.

2.3.2 Technology Previews for Virtualization Support

- Guests for non-realtime sensitive workloads.

- Docker containers and real-time capabilities.

- Realtime-sensitive workloads guests. This means that you can install both RT and non-RT VM on a single machine. With proper system settings and application analysis, RT and non-RT guests can co-exist without affecting each other.

2.4 Limitations

Normally, the RT deadlines and constraints are defined by the application, not the OS itself. If an application cannot tolerate any interference or if it's just barely making it's deadlines, then live patching may cause the deadline to be missed. It doesn't matter if live patching takes 1 microsecond or 1 second to complete if it causes the application to exceed its time budget.

At least the below three situations have to be taken into an account:

- Live patching of a process that is not running in the kernel right now.

- Overhead of the patched function

- Impact to a task running within the kernel at the time of patching

2.5 Documentation and other information

2.5.1 Available on the product media

- Read the READMEs on the media.

- Get the detailed change log information about a particular package from the RPM (where `FILENAME.rpm` is the name of the RPM):

```
rpm --changelog -qp FILENAME.rpm
```

- Check the `ChangeLog` file in the top level of the installation medium for a chronological log of all changes made to the updated packages.

- Find more information in the `docu` directory of the installation medium of SUSE Linux Enterprise Real Time 15 SP6. This directory includes PDF versions of the SUSE Linux Enterprise Real Time 15 SP6 Installation Quick Start Guide.

- Get list of manual pages with usage information about a particular package from the RPM (where `FILENAME.rpm` is the name of the RPM):

```
rpm --docfiles -qp FILENAME.rpm | grep man
```

2.5.2 Online documentation

- For the most up-to-date version of the documentation for SUSE Linux Enterprise Real Time 15 SP6, see https://documentation.suse.com/sle-rt/15-SP6/ ↗.

- Find a collection of White Papers in the SUSE Linux Enterprise Real Time Resource Library at https://www.suse.com/products/realtime/ ↗.

For more information, check our Support Policy page https://www.suse.com/support/policy.html ↗ or the Long Term Service Pack Support Page https://www.suse.com/support/programs/long-term-service-pack-support.html ↗.

2.6 Support statement for SUSE Linux Enterprise Real Time

To receive support, you need an appropriate subscription with SUSE. For more information, see https://www.suse.com/support/programs/subscriptions/?id=SUSE_Linux_Enterprise_Server ↗.

The following definitions apply:

L1

Problem determination, which means technical support designed to provide compatibility information, usage support, ongoing maintenance, information gathering and basic troubleshooting using available documentation.

L2

Problem isolation, which means technical support designed to analyze data, reproduce customer problems, isolate problem area and provide a resolution for problems not resolved by Level 1 or prepare for Level 3.

L3

Problem resolution, which means technical support designed to resolve problems by engaging engineering to resolve product defects which have been identified by Level 2 Support.

For contracted customers and partners, SUSE Linux Enterprise Real Time is delivered with L3 support for all packages, except for the following:

- Technology Previews, see *Section 2.3, "Technology Previews"*

- Sound, graphics, fonts and artwork

- Packages that require an additional customer contract, see *Section 2.6.2, "Software requiring specific contracts"*

- Some packages shipped as part of the module *Workstation Extension* are L2-supported only

- Packages with names ending in `-devel` (containing header files and similar developer resources) will only be supported together with their main packages.

SUSE will only support the usage of original packages. That is, packages that are unchanged and not recompiled.

2.6.1 General support

To learn about supported features and limitations, refer to the following sections in this document:

- *Section 2.2, "Hardware Platform Support"*

2.6.2 Software requiring specific contracts

Certain software delivered as part of SUSE Linux Enterprise Real Time may require an external contract. Check the support status of individual packages using the RPM metadata that can be viewed with `rpm`, `zypper`, or YaST.

Major packages and groups of packages affected by this are:

- PostgreSQL (all versions, including all subpackages)

2.6.3 Software under GNU AGPL

SUSE Linux Enterprise Real Time 15 SP6 (and the SUSE Linux Enterprise modules) includes the following software that is shipped *only* under a GNU AGPL software license:

- Ghostscript (including subpackages)

SUSE Linux Enterprise Real Time 15 SP6 (and the SUSE Linux Enterprise modules) includes the following software that is shipped under multiple licenses that include a GNU AGPL software license:

- MySpell dictionaries and LightProof

3 Installation

This section includes information related to the initial installation of SUSE Linux Enterprise Real Time 15 SP6.

For installation documentation, see section 2 of the Setup Guide at https://documenta-tion.suse.com/sle-rt/15-SP6/single-html/SLE-RT-setup/#article-setup ↗

3.1 Real Time kernel not selected as default

Due to the way kernels are sorted, the Real Time kernel might not be selected as the default one after installation. You can use YaST to select the default kernel.

4 Obtaining source code

This SUSE product includes materials licensed to SUSE under the GNU General Public License (GPL). The GPL requires SUSE to provide the source code that corresponds to the GPL-licensed material. The source code is available for download at https://www.suse.com/download/sle-rt/ ↗ on Medium 2. For up to three years after distribution of the SUSE product, upon request, SUSE will mail a copy of the source code. Send requests by e-mail to sle_source_request@suse.com (mailto:sle_source_request@suse.com) ↗. SUSE may charge a reasonable fee to recover distribution costs.

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