SUSE

SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease)

Release Notes

SUSE Linux Enterprise High Availability Extension is an enterprise-level clustering solution to implement highly available Linux clusters and eliminate single points of failure. This document provides a high-level overview of features, capabilities, and limitations of SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease), and highlights important product updates.

This product will be released in June 2024. The latest version of these release notes is always available at https://www.suse.com/releasenotes ↗. Drafts of the general documentation can be found at https://susedoc.github.io/doc-sle-ha/main ↗.

Publication Date: 2023-10-10, Version: @VERSION@

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 High Availability Extension

SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) is an industry-leading open source high availability clustering system. It is designed to virtually eliminate unplanned downtime, be easy to use and be deployed in both physical and virtual environments. Also included are geo clustering capabilities, designed to manage cluster servers in data centers anywhere in the world. High availability clustering helps to minimize data loss due to corruption or failure by protecting your data assets using your existing IT infrastructure.

High availability clustering is used to automate application and data recovery. You can use our flexible, policy-driven clustering solution to implement highly available Linux clusters and eliminate single points of failure. Your servers are continuously monitored, and when a fault or failure occurs, the workload is transferred from one server to another, or the application is automatically restarted on a known working system. This helps you maintain business continuity and minimize unplanned downtime.

2.1 What Is New?

2.1.1 General Changes in Codestream 15

SUSE Linux Enterprise High Availability Extension 15 introduces many innovative changes compared to SUSE Linux Enterprise High Availability Extension 12. The most important changes are listed below.

2.1.2 Changes in 15 SP6 (prerelease)

SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) introduces changes compared to SUSE Linux Enterprise High Availability Extension SP5. The most important changes are listed below.

2.1.3 Changes in the Base Product

In addition to these release notes, make sure to also review the release notes for the base product, SUSE Linux Enterprise Server 15 SP6 (prerelease). They are published at https://www.suse.com/releasenotes/x86_64/SUSE-SLES/15-SP6 ↗ (these release notes are identical across all supported hardware architectures).

2.2 Important Sections of This Document

If you are upgrading from a previous SUSE Linux Enterprise High Availability Extension release, you should review at least the following sections:

- *Section 2.5, "Support statement for SUSE Linux Enterprise High Availability Extension"*

- *Section 5.2, "Upgrade-Related Notes"*

2.3 Documentation and other information

2.3.1 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 High Availability Extension 15 SP6 (prerelease). This directory includes PDF versions of the SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) Installation Quick Start Guide.

2.3.2 Online documentation

- For the most up-to-date version of the documentation for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease), see https://susedoc.github.io/doc-sleha/main ↗ (draft version).

- Find a collection of White Papers in the SUSE Linux Enterprise High Availability Extension Resource Library at https://www.suse.com/products/server#resources ↗.

2.4 Support and life cycle

SUSE Linux Enterprise High Availability Extension is backed by award-winning support from SUSE, an established technology leader with a proven history of delivering enterprise-quality support services.

SUSE Linux Enterprise High Availability Extension 15 has a 13-year life cycle, with 10 years of General Support and 3 years of Extended Support. The current version (SP6) will be fully maintained and supported until 6 months after the release of SUSE Linux Enterprise High Availability Extension 15 SP7.

If you need additional time to design, validate and test your upgrade plans, Long Term Service Pack Support can extend the support duration. You can buy an additional 12 to 36 months in twelve month increments. This means, you receive a total of 3 to 5 years of support per Service Pack.

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 ↗.

2.5 Support statement for SUSE Linux Enterprise High Availability Extension

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

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 High Availability Extension is delivered with L3 support for all packages, except for the following:

- Technology Previews, see *Section 2.6, "Technology Previews"*

- Sound, graphics, fonts and artwork

- Packages that require an additional customer contract, see *Section 2.5.2, "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.

2.5.1 General support

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

2.5.2 Software requiring specific contracts

Certain software delivered as part of SUSE Linux Enterprise High Availability Extension 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)

2.5.3 Software under GNU AGPL

SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) (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 High Availability Extension 15 SP6 (prerelease) (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

- ArgyllCMS

2.6 Technology Previews

Technology previews are packages, stacks, or features delivered by SUSE to provide glimpses into upcoming innovations. Technology previews are included for your convenience to give you a chance to test new technologies within your environment. We would appreciate your feedback! If you test a technology preview, contact your SUSE representative and let them know about your experience and use cases. Your input is helpful for future development.

Technology previews come with the following limitations:

- Technology previews are still in development. Therefore, they may be functionally incomplete, unstable, or in other ways not suitable for production use.

- Technology previews are **not** supported.

- Technology previews may only be available for specific hardware architectures. Details and functionality of technology previews are subject to change. As a result, upgrading to subsequent releases of a technology preview may be impossible and require a fresh installation.

- Technology previews can be removed from a product at any time. This may be the case, for example, if SUSE discovers that a preview does not meet the customer or market needs, or does not comply with enterprise standards.

3 Modules, Extensions, and Related Products

This section comprises information about modules and extensions for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease). Modules and extensions add parts or functionality to the system.

3.1 Modules in the SLE 15 SP6 (prerelease) Product Line

The SLE 15 SP6 (prerelease) product line is made up of modules that contain software packages. Each module has a clearly defined scope. Modules differ in their life cycles and update timelines.

The modules available within the product line based on SUSE Linux Enterprise 15 SP6 (prerelease) at the release of SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) are listed in the *Modules and Extensions Quick Start* at https://susedoc.github.io/doc-sle/main/html/SLES-modulesquick/ (draft version).

Not all SLE modules are available with a subscription for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease) itself (see the column *Available for*).

For information about the availability of individual packages within modules, see https://sc-c.suse.com/packages ↗ .

3.2 Available Extensions

Extensions add extra functionality to the system and require their own registration key, usually at additional cost. Usually, extensions have their own release notes documents that are available from https://www.suse.com/releasenotes ↗ .

The following extensions are available for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease):

- SUSE Linux Enterprise Live Patching: https://www.suse.com/products/live-patching ↗

- SUSE Linux Enterprise High Availability Extension: https://www.suse.com/products/high-availability ↗

Additionally, there is the following extension which is not covered by SUSE support agreements, available at no additional cost and without an extra registration key:

- SUSE Package Hub: https://packagehub.suse.com/ ↗

3.3 Derived and Related Products

This sections lists derived and related products. Usually, these products have their own release notes documents that are available from https://www.suse.com/releasenotes ↗ .

- SUSE Linux Enterprise JeOS: https://www.suse.com/products/server/jeos ↗

- SUSE Linux Enterprise Desktop: https://www.suse.com/products/desktop ↗

- SUSE Linux Enterprise Server for SAP Applications: https://www.suse.com/products/sles-for-sap ↗

- SUSE Linux Enterprise for High-Performance Computing: https://www.suse.com/products/server/hpc ↗

- SUSE Linux Enterprise Real Time: https://www.suse.com/products/realtime ↗

- SUSE Manager: https://www.suse.com/products/suse-manager ↗

4 Changes affecting all architectures

Information in this section applies to all architectures supported by SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease).

5 Installation and Upgrade

SUSE Linux Enterprise High Availability Extension can be deployed in several ways:

- Physical machine

- Virtual host

- Virtual machine

- System containers

- Application containers

5.1 Installation

This section includes information related to the initial installation of SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease). Make sure to also review the respective section of the release notes for the base product, SUSE Linux Enterprise Server 15 SP6 (prerelease) which are published at https://www.suse.com/releasenotes/x86_64/SUSE-SLES/15-SP6 ↗.

> ⓘ **Important: Installation Documentation**
>
> The following release notes contain additional notes regarding the installation of SUSE Linux Enterprise High Availability Extension. However, they do not document the installation procedure itself.
>
> For installation documentation, see the *Installation and Setup Quick Start* at https://suse-doc.github.io/doc-sleha/main/SLE-HA-install-quick ↗ (draft version) and the *Geo Clustering Quick Start* at https://susedoc.github.io/doc-sleha/main/SLE-HA-geo-quick ↗ (draft version).

5.2 Upgrade-Related Notes

This section includes upgrade-related information for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease). Make sure to also review the respective section of the release notes for the base product, SUSE Linux Enterprise Server 15 SP6 (prerelease) which are published at https://www.suse.com/releasenotes/x86_64/SUSE-SLES/15-SP6 ↗ .

> **❗ Important: Upgrade Documentation**
>
> The following release notes contain additional notes regarding the upgrade of SUSE Linux Enterprise High Availability Extension. However, they do not document the upgrade procedure itself.
>
> For upgrade documentation, see the *Admin Guide* at https://susedoc.github.io/doc-sle-ha/main/html/SLE-HA-administration/ ↗ (draft version).

5.2.1 Make Sure the Current System Is Up-To-Date Before Upgrading

Upgrading the system is only supported from the most recent patch level. Make sure the latest system updates are installed by either running `zypper patch` or by starting the YaST module Online-Update. An upgrade on a system not fully patched may fail.

5.2.2 Skipping Service Packs Requires LTSS

Skipping service packs during an upgrade is only supported if you have a Long Term Service Pack Support contract. Otherwise you first need to upgrade to SP5 before upgrading to SP6.

5.3 For More Information

For more information, see *Section 4, "Changes affecting all architectures"* and the sections relating to your respective hardware architecture.

6 Cluster

This section lists cluster-related information for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease).

6.1 Improve the graceful shutdown for the whole cluster

There are several common use cases that might not result in a graceful shutdown of the whole cluster:

1. When a user takes down the cluster nodes one by one a diskless-sbd cluster, the nodes get fenced unexpectedly once the cluster is inquorate.

2. In the dlm cluster, with the highly suggested configuration `no-quorum-policy=freeze`, the cluster shutdown will hang once the cluster is inquorate. A new option `set_config` of `dlm_tools` is expected to help this situation.

3. To shutdown the normal cluster, the system admin often takes down the cluster nodes one by one. This might create unnecessary the resources migration chaos among nodes.

To help with some of these, a new `--all` options has been added to `crmsh`. The `--all` option tries to simplify the procedure and to make it more smoothly and reliable.

> ✋ **Warning**
>
> The `--all` option alone does not guarantee a graceful shutdown because the unforesee-able resource stop-failure might happen at the application level, which is out of the scope of the `--all` option. This means that users may need to take additional steps to match their product expectation.

6.2 OCFS2 `nocluster` mount option has been added

Until now it was possible only to by bring up the whole OCFS2 cluster stack.

In SUSE Linux Enterprise HA 15 SP6 (prerelease), the `nocluster` mount option has been added. This, for example, allows to access a OCFS2 file system on a standalone server where it is not necessary to have a fully functional cluster stack.

7 High-Availability Tools

This section list information related to the high-availability tools of SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease).

7.1   HAProxy legacy HTTP mode removal

HAProxy 2.1 has removed support for the legacy HTTP mode. It now supports the Native HTTP Representation only, also known as HTX.

Here is the list of proxy keywords which were deprecated in version 2.0 and that have been removed in version 2.4:

- `block`
- `clitimeout`
- `contimeout`
- `option http-tunnel`
- `option http-use-htx`
- `redisp`
- `redispatch`
- `reqadd`
- `reqallow`
- `reqdel`
- `reqdeny`
- `reqiallow`
- `reqidel`
- `reqideny`
- `reqipass`
- `reqirep`
- `reqitarpit`
- `reqpass`
- `reqrep`
- `reqtarpit`
- `rspadd`

- `rspdel`

- `rspdeny`

- `rspidel`

- `rspideny`

- `rspirep`

- `rsprep`

- `srvtimeout`

- `timeout clitimeout`

- `timeout contimeout`

- `timeout srvtimeout`

- `transparent`

You can run `haproxy -c -f /path/to/haproxy.conf` to see if you have any incompatible or deprecated settings. To replace removed keywords:

- `block` - use the new `http-request deny` instead

- `clitimeout` - use `timeout client` instead

- `contimeout` - use `timeout connect`, `timeout queue`, or `timeout tarpit` instead

- `option http-tunnel` - this option has been removed because it cannot work in HTTP/2

- `option http-use-htx` - this option has been removed because the support for legacy HTTP mode has been removed

- `redisp`, `redispatch`, `reqadd`, `reqallow`, `reqdel`, `reqdeny`, `reqiallow`, `reqidel`, `reqideny`, `reqipass`, `reqirep`, `reqitarpit`, `eqpass`, `reqrep`, `reqtarpit` - these keywords need to be replaced by the `http-request` statement, see https://cbonte.github.io/haproxy-dconv/2.4/configuration.html#4.2-http-request ↗

- `rspadd`, `rspdel`, `rspdeny`, `rspidel`, `rspideny`, `rspirep`, `rsprep` - these keywords need to be replaced by the `http-response` statement, see https://cbonte.github.io/haproxy-dconv/2.4/configuration.html#4.2-http-response ↗

- `srvtimeout` - use `timeout server` instead

- `timeout clitimeout` - use `timeout client` instead

- `timeout contimeout` - use `timeout connect` instead

- `timeout srvtimeout` - use `timeout server` instead

- `transparent` - use `option transparent` instead

7.2   Relax-and-Recover (ReaR) 2.7

The `rear27a` package has been added.

For more information see the full changelog either online at https://github.com/rear/rear/blob/rear-2.7/doc/rear-release-notes.txt ↗ or in the `/usr/share/doc/packages/rear27a/rear-release-notes.txt` file.

🖐 **Warning**

Do not upgrade ReaR or change the software used by ReaR without also checking that your existing disaster recovery procedure still works. See also the *SUSE support for Relax-and-Recover* and *Version upgrades with Relax-and-Recover* sections in https://en.opensuse.org/SDB:Disaster_Recovery ↗.

8   Storage

This section list storage-related information for SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease).

8.1   `defragfs.ocfs2` has been enabled

In SUSE Linux Enterprise HA 15 SP6 (prerelease), the online defragmenter for the OCFS2 (Oracle Cluster Filesystem 2) filesystem, called `defragfs.ocfs2`, has been enabled.

9   Removed and Deprecated Features and Packages

This section lists features and packages that got removed from SUSE Linux Enterprise High Availability Extension or will be removed in upcoming versions.

9.1   Removed Features and Packages

The following features and packages had been deprecated with a previous release and have been
removed with SUSE Linux Enterprise High Availability Extension 15 SP6 (prerelease).

- `pssh` has been removed. Use `crm cluster run` instead.

9.2   Deprecated Features and Packages

The following features and packages are deprecated and will be removed with a future service
pack of SUSE Linux Enterprise High Availability Extension.

9.2.1   Nagios-related plugins have been removed

The full list of removed packages is as follows:

- `monitoring-plugins-metadata`
- `monitoring-plugins-mysql`
- `monitoring-plugins-fping`
- `monitoring-plugins-pgsql`
- `monitoring-plugins-http`
- `monitoring-plugins-tcp`
- `monitoring-plugins-ldap`

9.2.2   `ha-cluster-* commands have been deprecated

The implementation has been moved to `crmsh`:

- `ha-cluster-init` is now `crmsh cluster init`
- `ha-cluster-bootstrap` is now `crmsh cluster bootstrap`
- `ha-cluster-join` is now `crmsh cluster join`
- `ha-cluster-geo-init` is now `crmsh cluster geo-init`

- `ha-cluster-geo-join` is now `crmsh cluster geo-join`

- `ha-cluster-init-arbitrator` is now `crmsh cluster init-arbitrator`

9.2.3 `hb_report` CLI has been deprecated

The `hb_report` CLI part of `crmsh` has been deprecated and will be removed in the future.

As a replacement, the next version of `crmsh` will improve its standard logging capabilities.

10 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-ha/ ⬈ 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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A Changelog for 15 SP6 (prerelease)

A.1 2023-10-19

- Initial 15 SP6 (prerelease) release

A.1.1 New

- *Section 9.2.1, "Nagios-related plugins have been removed"* (Jira (https://jira.suse.com/browse/SLE-3877) ↗)