SAP HANA Appliance Operating System Upgrade

Upgrade Paths for SAP HANA Appliances Running on Dell Technologies Servers

January 2025

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White Paper

Abstract

This white paper describes the upgrade of Dell Technologies SAP HANA appliances to a later operating system version.

Dell Technologies Solutions

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Revisions

Date	Description
January 2025	Added Red Hat Enterprise Linux 9.4 and SUSE Linux Enterprise Server 15 SP6
February 2024	Added Red Hat Enterprise Linux 9.2
January 2024	Added Red Hat Enterprise Linux 8.8, 9.0, and SUSE Linux Enterprise Server 15 SP5
April 2023	Added Red Hat Enterprise Linux 8.6 and SUSE Linux Enterprise Server 15 SP4
May 2022	Added Red Hat Enterprise Linux 8.2, 8.4 and SUSE Linux Enterprise Server 15 SP2, SP3
October 2020	Added Red Hat Linux 8.1
April 2020	Added SUSE Linux Enterprise Server 15 SP1 and Red Hat Enterprise Linux 8
June 2019	Added Red Hat Enterprise Linux 7.6 and Cascade Lake systems
January 2019	Added SUSE Linux Enterprise Server 15, SUSE Linux Enterprise Server 12 SP4, Red Hat Enterprise Linux 6.10, and Red Hat Enterprise Linux 7.5 Added virtual solutions expiration dates
August 2018	Added PowerEdge 840 scale-up systems
April 2018	Added Red Hat Enterprise Linux 7.4 upgrade instructions
January 2018	Added Red Hat Enterprise Linux 7.3 for Haswell
October 2017	Added SUSE Linux Enterprise Server 12 SP2 for scale-up Skylake and Broadwell solutions, and Skylake scale-up Red Hat Enterprise Linux 7.3 support
September 2017	Added new SAP HANA capability matrix
July 2017	Added SUSE Linux Enterprise Server 12 SP2 for the Broadwell scale-out solutions
June 2017	Added SUSE Linux Enterprise Server 12 SP2 solutions and upcoming Skylake scale-up solutions
May 2017	Added new SAP HANA/operating system matrix
April 2017	• Enhanced Red Hat Enterprise Linux 6.6 to 6.7 upgrade procedure and added section for 6.7 to 7.2 • Recommendation on how to migrate existing R910 appliance customers
February 2017	Updated operating system and platform support matrix
January 2017	Added a detailed operating system version Matrix (which operating system is supported with which SAP HANA version)
November 2016	Enhanced SUSE Linux Enterprise Server 12 upgrade instructions
October 2016	Added SUSE Linux Enterprise Server 12 SP1 upgrade instructions
August 2016	Added detailed upgrade instructions for SUSE Linux Enterprise Server 11 SP3 to SUSE Linux Enterprise Server 12
June 2016	Added SAP HANA SPS12 and the SAP HANA version dependency matrix
May 2016	• Added Red Hat Enterpriser Linux 6.7 EOS support • Added scale-out 6.7 upgrade

Date	Description
April 2016	• Added instructions about how to update Red Hat Enterprise Linux 6.5 to 6.6 using the media • Added scale-out SP4 support and SUSE Linux Enterprise Server 12 support for scale-up solutions
February 2016	Added matrix of validated SAP HANA scale-out solutions and SUSE Linux Enterprise Server 11 SP4
December 2015	Added Red Hat Enterprise Linux 6.7 instructions
November 2015	Support of R930 Haswell
September 2015	Added support end date of SUSE Linux Enterprise Server 11 SP3
July 2015	Added upgrade from Red Hat Enterprise Linux 6.5 to 6.6
February 2015	Added SUSE Linux Enterprise Server 11 SP3 for Westmere support and links to the FusionIO drivers
August 2014	Initial release

Scope of this white paper

This white paper describes the upgrade of an SAP HANA appliance to a later operating system version. The intention of this white paper is only to provide guidance for an easier upgrade path. This information comes without any warranty. Before performing an upgrade, see the official third-party documentation from SUSE, Red Hat, and VMware.

Note: This white paper is not intended as a step-by-step instruction document, and Dell Technologies does not support it as an official update procedure.

Prerequisites

You need operating system root access to the SAP HANA appliance. All appliances must be registered with SUSE or Red Hat before you can upgrade to a later version using an operating system upgrade tool (for example, Zypper or yum).

To determine if a supported upgrade path is available for your hardware and operating system version, see the SAP HANA operating system revisions matrix.

Current operating system version

SUSE

To identify which operating system version and service pack you are running, run the following command:

`cat /etc/os-release` (SUSE Linux Enterprise Server 12 and later)

Example:

```
delhanar03:~ # cat /etc/os-release
NAME="SLES"
VERSION="12-SP4"
VERSION_ID="12.4"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles_sap:12:sp4"
```

Red Hat

To identify which operating system version and service pack you are running, run the following command:

`cat /etc/os-release` (Red Hat Enterprise Linux and later)

Example:

```
delhanar03:~ # cat /etc/os-release

NAME="Red Hat Enterprise Linux Server"
VERSION="7.6 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.6:GA:server"
HOME_URL="https://www.redhat.com/"
BUG_REPORT_URL="https://bugzilla.redhat.com/"

REDHAT_BUGZILLA_PRODUCT="Red Hat Enterprise Linux 7"
REDHAT_BUGZILLA_PRODUCT_VERSION=7.6
REDHAT_SUPPORT_PRODUCT="Red Hat Enterprise Linux"
REDHAT_SUPPORT_PRODUCT_VERSION="7.6"
```

SAP HANA operating system revisions matrix

The following table lists the Support Package Stacks (SPSs) and the supported operating system versions:

Table 1. SAP HANA SPSs and operating system versions

SAP HANA service package stacks	Note
SPS12	Update to GCC 4.8 is mandatory before going to SPS11/SPS12
SAP HANA 2.0	Update to GCC 5.x runtime is mandatory before upgrading to HANA 2.0
SAP HANA 2.0 SPS02/SPS03	Update to GCC 6.x runtime is mandatory before upgrading to HANA 2.0 SPS02
SAP HANA 2.0 SPS04	Update to GCC 7.x runtime is mandatory before upgrading to HANA 2.0 SPS04
SAP HANA 2.0 SPS05	N/A
SAP HANA 2.0 SPS06	3018133 - Linux: Running SAP applications compiled with GCC 10.x - SAP ONE Support Launchpad
SAP HANA 2.0 SPS07	3216146 - Linux: Running SAP applications compiled with GCC 11.x

The following sections of this white paper list all valid combinations:

- Available upgrade paths for scale-up solutions
- Available upgrade paths for scale-out solutions

See the following:

- For a list of supported SAP HANA operating system releases and compatible SAP HANA SPSs, see SAP Note 2235581 - SAP HANA: Supported Operating Systems.
- For an overview of the different service packs, see the SAP community wiki.
- For information about the maintenance strategy for SAP applications, see SAP Note 52505 - Support after end of mainstream/extended maintenance.
- For information about the SAP HANA update paths for SAP HANA maintenance revisions, see the SAP Note 1948334: SAP HANA Database Update Paths for SAP HANA Maintenance Revisions.
- Release strategy for HANA 2.0

Operating system support life cycle

SUSE

The following table provides end-of-support dates for SUSE operating system versions, which are subject to change. For the most current information, see SUSE Product Support Lifecycle.

Table 2. SUSE operating system versions: End of support

Operating system	End of support
SUSE Linux Enterprise Server for SAP Applications 15 SP3	December 31, 2025
SUSE Linux Enterprise Server for SAP Applications 15 SP4	December 31, 2026
SUSE Linux Enterprise Server for SAP Applications 15 SP5	December 31, 2027
SUSE Linux Enterprise Server for SAP Applications 15 SP6	TBD

Red Hat

The following table provides end-of-support dates for Red Hat Enterprise Linux operating system versions.

The information in the following table is subject to change. For the most current information, see Red Hat Enterprise Linux Life Cycle.

Table 3. Red Hat Enterprise Linux operating system versions: End of support

Operating system	End of support date
Red Hat Enterprise Linux 8.6 for SAP Solutions	May 31, 2026
Red Hat Enterprise Linux 8.8 for SAP Solutions	May 31, 2027
Red Hat Enterprise Linux 9.0 for SAP Solutions	May 31, 2026
Red Hat Enterprise Linux 9.2 for SAP Solutions	May 31, 2027
Red Hat Enterprise Linux 9.4 for SAP Solutions	April 30, 2028

VMware ESXi

The following table provides end-of-support dates for VMware ESXi hypervisor versions. The current list is available at VMware Lifecycle Product Matrix.

Table 4. VMware ESXi hypervisor versions: End of support

VMware version	End of support
ESXi 7.0	2 April 2025
ESXi 8.0	11 October 2027

Available upgrade paths for scale-up solutions

Before performing an upgrade, determine if an upgrade path is available for your appliance and operating system version.

To manage the total cost of ownership (TCO) model, determine if an upgrade to a later hardware generation is possible. With every CPU generation, expect a performance gain of up to 30 percent.

The following tables list the available upgrade paths for PowerEdge servers:

Table 5. Available upgrade paths for PowerEdge R920 scale-up systems

Server model (CPU)	Supported operating systems
R920 (Intel Ivy Bridge)	• SUSE Linux Enterprise Server 11 SP3/SP4 for SAP applications • SUSE Linux Enterprise Server 12 GM/SP1/SP2 for SAP applications • Red Hat Enterprise Linux 6.5/ 6.6/6.7 for SAP HANA • Red Hat Enterprise Linux 7.4 for SAP Solutions

Table 6. Available upgrade paths for PowerEdge R930 scale-up systems

Server model (CPU)	Supported operating systems
R930 (Intel Haswell)	• SUSE Linux Enterprise Server 11 SP3/SP4 for SAP applications • SUSE Linux Enterprise Server 12 GM/SP1/SP2/SP3/SP4 for SAP applications • Red Hat Enterprise Linux 6.6/ 6.7 for SAP HANA • Red Hat Enterprise Linux 7.2/7.3/7.4/7.5/7.6 for SAP Solutions
R930 (Intel Broadwell)	• SUSE Linux Enterprise Server 11 SP4 for SAP applications • SUSE Linux Enterprise Server 12 SP1/SP2/SP3/SP4 for SAP applications • SUSE Linux Enterprise Server 15 GM/SP1 for SAP applications • Red Hat Enterprise Linux 6.7 for SAP HANA • Red Hat Enterprise Linux 7.2/7.3/7.4/7.5/7.6 for SAP HANA

Table 7. Available upgrade paths for PowerEdge R940 scale-up systems

Server model (CPU)	Supported operating systems
R940/R740xd (Intel Skylake)	• SUSE Linux Enterprise Server 12 SP2/SP3/SP4 for SAP applications • SUSE Linux Enterprise Server 15 GM/SP1/SP2/SP3/SP4/SP5/SP6 for SAP applications • Red Hat Enterprise Linux 7.3/7.4/7.5/7.6/7.9 for SAP HANA • Red Hat Enterprise Linux 8.1/8.2/8.4/8.6 for SAP Solutions
R940 (Intel Cascade Lake)	• SUSE Linux Enterprise Server 12 SP4 for SAP applications • SUSE Linux Enterprise Server 15 GM/SP1/SP2/SP3/SP4/SP5/SP6 for SAP applications • Red Hat Enterprise Linux 7.6/7.9 for SAP Solutions • Red Hat Enterprise Linux 8.0/8.1/8.2/8.4/8.6/8.8 for SAP Solutions • Red Hat Enterprise Linux 9.0/9.2/9.4 for SAP Solutions

Table 8. Available upgrade paths for PowerEdge R840 scale-up systems

Server model (CPU)	Supported operating systems
R840 (Intel Skylake)	• SUSE Linux Enterprise Server 12 SP3/SP4/SP5 for SAP applications • SUSE Linux Enterprise Server 15 GM/SP1/SP2/SP3/SP4/SP5/SP6 for SAP applications • Red Hat Enterprise Linux 7.4/7.5/7.6/7.9 for SAP Solutions • Red Hat Enterprise Linux 8.0/8.1/8.2/8.4/8.6 for SAP Solutions
R840 (Intel Cascade Lake)	• SUSE Linux Enterprise Server 15 GM/SP1/SP2/SP3/SP4/SP5 for SAP applications • Red Hat Enterprise Linux 7.6/7.9 for SAP Solutions • Red Hat Enterprise Linux 8.0/8.1/8.2/8.4/8.6/8.8 for SAP Solutions • Red Hat Enterprise Linux 9.0/9.2/9.4 for SAP Solutions

Table 9. Available upgrade paths for PowerEdge R750 scale-up systems

Server model (CPU)	Supported operating systems
R750 (Intel Ice Lake)	• SUSE Linux Enterprise Server 15 SP2/SP3/SP4/SP5/SP6 for SAP applications • Red Hat Enterprise Linux 8.2/8.4/8.6/8.8 for SAP Solutions • Red Hat Enterprise Linux 9.0/9.2/9.4 for SAP Solutions

Table 10. Available upgrade paths for PowerEdge R760/R860 scale-up systems

Server model (CPU)	Supported operating systems
R760/R860 (Intel Sapphire Rapids)	• SUSE Linux Enterprise Server 15 SP4/SP5/SP6 for SAP applications • Red Hat Enterprise Linux 8.6/8.8 for SAP Solutions • Red Hat Enterprise Linux 9.0/9.2/9.4 for SAP Solutions

Table 11. Available upgrade paths for PowerEdge R760 scale-up systems

Server model (CPU)	Supported operating systems
R760 (Intel Emerald Rapids)	• SUSE Linux Enterprise Server 15 SP5/SP6 for SAP applications • Red Hat Enterprise Linux 9.4 for SAP Solutions

To identify the latest version of the service pack that you can use with an appliance, see Certified and Supported SAP HANA Hardware Directory.

Available upgrade paths for scale-out solutions

Before performing an upgrade, determine if an upgrade path is available for your appliance and operating system version.

For a Red Hat Enterprise Linux operating system upgrade, it is recommended that you subscribe to the relevant Red Hat Enterprise Linux EUS channel to stay on Red Hat Enterprise, see the Red Hat Knowledgebase.

The following tables list the available upgrade paths for PowerEdge servers:

Table 12. Available upgrade paths for PowerEdge R930 scale-out systems

Server model (CPU) and storage	Supported operating systems
R930 (Intel Haswell) and Dell SC4020/SC8000	• SUSE Linux Enterprise Server 12 SP1 for SAP applications • Red Hat Enterprise Linux 7.2 for SAP HANA
R930 (Intel Broadwell) and Dell SC4020	• SUSE Linux Enterprise Server 12 SP1/ SP2/SP3 for SAP applications • Red Hat Enterprise Linux 7.2/7.3/7.4 for SAP HANA

Table 13. Available upgrade paths for PowerEdge R940 scale-out systems

Server model (CPU) and storage	Supported operating systems
R940 (Intel Skylake) and Dell SC5020	• SUSE Linux Enterprise Server 12 SP2/SP3 for SAP applications • Red Hat Enterprise Linux 7.3/7.4 for SAP Solutions

Table 14. Available upgrade paths for PowerEdge R940 scale-out systems

Server model (CPU) and storage	Supported operating systems
R940 (Intel Cascade Lake) and Unity 650F	• SUSE Linux Enterprise Server 15 for SAP applications

Table 15. Available upgrade paths for PowerEdge R960 scale-out systems

Server model (CPU) and storage	Supported operating systems
R960 (Intel Sapphire Rapids) and Dell PowerMax 2500	• SUSE Linux Enterprise Server 15 SP5 for SAP applications • Red Hat Enterprise Linux 9.2 for SAP Solutions

To identify the latest version of the service pack that you can use with an appliance, see Certified and Supported SAP HANA Hardware Directory.

Upgrades

Prerequisites

Before you perform an upgrade, it is recommended that you create a backup of the SAP HANA database and the operating system.

Stopping the database on scale-out systems

The procedure varies depending on your setup. To stop the database on a scale-out system:

1. Shut down the SAP HANA database by running the following command:

   ```
   sapcontrol –nr <InstanceId> -function StopSystem HDB 1000 500
   ```

2. Ensure that the database is stopped on all nodes by running either of the following commands:

   - `ps faux|grep [h]db`
   - `ps faux|grep [s]apadm`

If the OCFS2 is not defined as a cluster resource, follow these steps:

1. Unmount the OCFS2 file system on all nodes by running the following command:

   ```
   umount –a –t ocfs2
   ```

2. Ensure that the OCFS2 file system is not mounted if a process is still accessing it.

   The output of the command `grep ocfs2 /proc/mounts` must be empty. If it is not, identify the process that is blocking the unmount by running the following command:

   ```
   lsof /hana/shared
   ```

   Kill that process and repeat step 3.

3. Stop the cluster on all nodes by running the following command:

   ```
   /etc/init.d/openais stop
   ```

4. When the upgrade is complete, restart the nodes one after the other.
5. Verify that the OCFS2 volumes are mounted correctly and the database is available.

Cluster maintenance mode

Before you perform an upgrade, it is recommended that you place the cluster into maintenance mode or shut it down.

You can place the cluster into maintenance mode by running the following command:

```
crm configure property maintenance-mode=true
```

You can disable the mode later by running the following command:

```
crm configure property maintenance-mode=false
```

You can disable the cluster service before an upgrade by running the following command:

```
chkconfig openais off
```

After a successful update, you can enable the cluster by running the following command:

```
chkconfig openais on
```

Postupgrade activities

After you perform an upgrade, verify that all recommended operating system settings have been implemented.

If an SAP HANA Hardware Configuration Check Tool (HWCCT) is used for validation, ensure that you download the latest patches from SAP Note 2161344: HWCCT patch note.

SUSE

For information about updating SAP HANA/ operating system versions to a later version, see the *Linux Operating System with SAP HANA Reference Guide*.

See the SUSE Linux Enterprise Server Upgrade Guide to consolidate the available upgrade path, as shown in the following figure from the SUSE Linux Enterprise Server website:

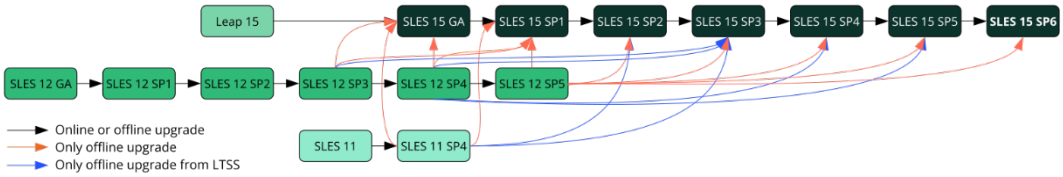

Figure 1. SUSE Linux Enterprise Server upgrade path

Media download

You can get an evaluation copy of an ISO image from the SUSE website.

SUSE Linux Enterprise Server 11 SP4 to SUSE Linux Enterprise Server 12 SP1 for SAP applications

To perform an upgrade from SUSE Linux Enterprise Server 11 SP4 to SUSE Linux Enterprise Server 12 SP1 for scale-up physical solutions, using the DVD update process:

1. Boot from the SUSE Linux Enterprise Server 12 SP1 for SAP Applications DVD and select **Upgrade** in the boot menu.
2. If you get an error message such as `nothing provides libeventlog.so`, select solution 1 to uninstall syslog-ng.

   During the upgrade, `rsyslog` replaces `syslog-ng`.
3. In the **Installation Settings** window, select **Packages** and then click **Search**.
   a. Remove the `SUSE_SLES_SAP-release` and `elilo` packages.

Note: Do not touch SUSE_SLES-SAP-release-DVD.

b. Install the package `grub2-x86_64_efi`.

4. In the **Installation Settings** window, select **Booting** and clear **Enable Secure Boot Support**.
5. To determine if you must apply any changes to the operating system settings, see SAP Note 2205917 - SAP HANA DB: Recommended OS settings for SLES 12 / SLES for SAP Applications 12.

SUSE Linux Enterprise Server 12 SP1 to SUSE Linux Enterprise Server 12 SP2 for SAP Applications

To upgrade from SUSE Linux Enterprise Server 12 SP1 to SP2, using the DVD update method, follow these steps in addition to those steps provided in the official documentation, for scale-up physical solutions:

1. Boot from the SUSE Linux Enterprise Server 12 SP2 for SAP Applications DVD and select **Upgrade** from the boot menu.
2. On the **Installation Settings** overview page, select **Booting** and clear **Enable Secure Boot Support**.
3. To determine if you must apply any changes to the operating system settings, see SAP Note 2205917 - SAP HANA DB: Recommended OS settings for SLES 12 / SLES for SAP Applications 12.

SUSE Linux Enterprise Server 12 SP2 to SUSE Linux Enterprise Server 12 SP3 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 12 SP3 to SUSE Linux Enterprise Server 12 SP4 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 12 SP3/SP4 to SUSE Linux Enterprise Server 15 for SAP Applications

For the DVD update method, see the SUSE upgrade documentation. Also, follow these additional steps for scale-up physical solutions:

1. Boot from the SUSE Linux Enterprise Server 15 for SAP Applications Installations DVD `SLE-15-Installer-DVD-x86_64-GM-DVD1.iso` file and select **Upgrade** from the boot menu. During the upgrade process, you need the second media `SLE-15-Packages-x86_64-GM-DVD1.iso` file.

   During the deployment process, select the following modules:

   - Basesystem-Module 15-0
   - Desktop-Applications-Module 15-0
   - Legacy-Module 15-0
   - SLE-15-SAP 15-0
   - SLEHA15 15-0
   - Server-Applications-Module 15-0

2. To determine if you must apply any changes to the operating system settings, see SAP Note 2205917: SAP HANA DB: Recommended OS settings for SLES 12 / SLES for SAP Applications 12.

SUSE Linux Enterprise Server 15 to SUSE Linux Enterprise Server 15 SP1 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 15 SP1 to SUSE Linux Enterprise Server 15 SP2 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation and Remove nobarrier mount option for xfs filesystems in /etc/fstab.

SUSE Linux Enterprise Server 15 SP2 to SUSE Linux Enterprise Server 15 SP3 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 15 SP3 to SUSE Linux Enterprise Server 15 SP4 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 15 SP4 to SUSE Linux Enterprise Server 15 SP5 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

SUSE Linux Enterprise Server 15 SP5 to SUSE Linux Enterprise Server 15 SP6 for SAP Applications

For the DVD update method, refer to the SUSE upgrade documentation. There are no special considerations.

Red Hat

Media download

You can get an evaluation copy of an ISO image from the Red Hat website.

Log in to proceed with the download.

Recommended operating system settings for SAP HANA

Determine if you must apply the settings that are described in the following links to your updated version of the operating system. You might also need to apply additional packages.

- SAP Note 2292690: SAP HANA DB: Recommended OS settings for RHEL 7

For more information about updating SAP HANA/ operating system versions to a later version, see the *Linux Operating System with SAP HANA Reference Guide*.

Red Hat Enterprise Linux 6.7 over Red Hat Enterprise Linux 6.10 to Red Hat Enterprise Linux 7.4 using EUS channel

Red Hat offers an upgrade path from Red Hat Enterprise Linux 6.7 over Red Hat Enterprise Linux 6.10 to Red Hat Enterprise Linux 7.4. The Red Hat Knowledgebase and the Product Enhancement Advisor describe this process. Based on the pre-upgrade check, Red Hat does not advise upgrading these systems. For an upgrade to Red Hat Enterprise Linux 7.*x*, request reinstallation from a Dell Technologies service partner.

Verify if any version locks are set as described in Recommended operating system settings for SAP HANA. If any version locks are set, clear them before the upgrade procedure.

Red Hat Enterprise Linux 7.2 to Red Hat Enterprise Linux 7.3 using EUS channel

It is recommended that you subscribe the system to the EUS channel for long-term support of the Red Hat Enterprise Linux 7 series. For a description of the process, see the Red Hat Knowledgebase.

Determine if any version locks are set as described in Recommended operating system settings for SAP HANA, and clear them before performing the upgrade.

Ensure that the system is registered to the EUS channel. For more information, see the Red Hat Knowledgebase.

Red Hat Enterprise Linux 7.3 to Red Hat Enterprise Linux 7.4 using EUS channel

It is recommended that you subscribe the system to the EUS channel for long-term support of the Red Hat Enterprise Linux 7 series. For a description of the process, see the Red Hat Knowledgebase.

Determine if any version locks are set as described in Recommended operating system settings for SAP HANA, and clear them before performing the upgrade.

Ensure that the system is registered to the EUS channel. For more information, see the Red Hat Knowledgebase.

Red Hat Enterprise Linux 7.4 to Red Hat Enterprise Linux 7.5 (no E4S support)

Other than the Red Hat documentation, there are no special considerations.

Red Hat Enterprise Linux 7.5 to Red Hat Enterprise Linux 7.6

Other than the Red Hat documentation, there are no special considerations.

Note: Unlike Red Hat Enterprise Linux 7.4, Red Hat Enterprise Linux 7.5 has no extended update service, which results in a shorter maintenance window. It is recommended to continue to use Red Hat Enterprise Linux 7.4 and then upgrade to Red Hat Enterprise Linux 7.6, which is the next EUS release, when it is qualified for SAP HANA appliance workloads.

Red Hat Enterprise Linux 7.6 to Red Hat Enterprise Linux 8

Red Hat offers an upgrade path from Red Hat Enterprise Linux 7.6 to Red Hat Enterprise Linux 8. The Red Hat Knowledgebase and the Product Enhancement Advisor describe this process. Based on the preupgrade check, Red Hat does not advise upgrading these systems. For an upgrade to Red Hat Enterprise Linux 7.*x*, request reinstallation from a Dell Technologies service partner.

Verify if any version locks are set as described in Recommended operating system settings for SAP HANA. If any version locks are set, clear them before the upgrade procedure.

Red Hat Enterprise Linux 8 to Red Hat Enterprise Linux 8.1

Other than the Red Hat documentation, there are no special considerations.

Red Hat Enterprise Linux 8.1 to Red Hat Enterprise Linux 8.2

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=8.2
```

Red Hat Enterprise Linux 8.2 to Red Hat Enterprise Linux 8.4

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=8.4
```

Red Hat Enterprise Linux 8.4 to Red Hat Enterprise Linux 8.6

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=8.6
```

Red Hat Enterprise Linux 8.6 to Red Hat Enterprise Linux 8.8

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=8.8
```

Red Hat Enterprise Linux 8.6 to Red Hat Enterprise Linux 9.0

This upgrade is a major operating system upgrade. See the following document for instructions:

Upgrading from RHEL 8 to RHEL 9 Red Hat Enterprise Linux 9 | Red Hat Customer Portal

Red Hat Enterprise Linux 9.0 to Red Hat Enterprise Linux 9.2

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=9.2
```

Note: Ensure that the proper repositories are enabled. See Enable the Required Repositories in the Red Hat Documentation.

Red Hat Enterprise Linux 9.2 to Red Hat Enterprise Linux 9.4

To upgrade to the next supported version, the operating system must be instructed to allow this operation with the following command:

```
subscription-manager release --set=9.4
```

Note: Ensure that the proper repositories are enabled. See Enable the Required Repositories in the Red Hat Documentation.

References

SAP documentation

The following documentation on SAP.com provides additional and relevant information. Access to these documents depends on your login credentials. If you do not have access to a document, contact your Dell Technologies representative.

- SAP Note 2235581: Supported Operating Systems
- Certified and supported SAP HANA hardware directory
- SAP Note 2205917: SAP HANA DB: Recommended OS settings for SLES 12/SLES for SAP Applications 12
- 2684254 - SAP HANA DB: Recommended OS settings for SLES 15 / SLES for SAP Applications 15 - SAP ONE Support Launchpad

SUSE documentation

The following documentation on SUSE.com provides additional and relevant information:

- SUSE Product Support Lifecycle

Red Hat documentation

The following documentation on RedHat.com provides additional and relevant information:

- Red Hat Enterprise Linux Life Cycle