**Hewlett Packard Enterprise**

# HPE SUSE Linux Enterprise Operating System 15 SP3
# Installation Guide: CSM on HPE Cray EX Systems (22.03.0) (S-8043)

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## Contents

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# 2    Overview

## 2.1    Installation Overview

This document describes how to install SUSE Linux Enterprise OS (SLE OS) for HPE Cray EX on a system managed by Cray System Management (CSM) software.

The Install All program (`install_all.py`) installs the SLE OS archives (tarballs).

SLE rpms will be stored in new Nexus hosted repositories. The hosted repository names include the version (year, month, number, as YY.MM.N). For example: SUSE-YY.MM.N-SLE-Module-Basesystem-15-SP3-x86_64-Debug

Nexus group repositories will be configured to reference the newly installed Nexus hosted repositories. The group repository names do not include the version number. For example: SUSE-SLE-Module-Basesystem-15-SP3-x86_64-Debug

The same instructions are followed whether the administrator is installing SLE OS for the first time or upgrading SLE OS on a previously installed system.

Note that a SLE OS patch or update does not contain the complete set of SLE OS content required for an install or upgrade. The SUSE-Products-15-SP3-x86_64-YY.MM.N.tar.gz is not included in updates since it contains rpms that were in SUSE's General Availability (GA) release. Those rpms do not change throughout the life of the SUSE Service Pack.

Instructions will be provided with any SLE OS patches or updates explaining the update install process.

In addition to the tarballs contained in the SLE archive, we deliver three text files for each release. The text files contain information on the SUSE updates, CVEs and rpms contained in the release. The files are:

- sleupdates-15-SP3-YY.MM.N-update_list.txt - contains SUSE update details for the delivered tarballs.
- sleupdates-15-SP3-YY.MM.N-cve_list.txt - contains list of CVEs fixed in the devlivered tarballs.
- sleupdates-15-SP3-YY.MM.N-rpm_list.txt - contains list of rpms contained in the delivered tarballs.

# 3   Install or Upgrade SLE OS for HPE Cray EX

**Prerequisites:**

- Nexus must be installed and running.
- SUSE-Backports-SLE-15-SP3-x86_64-22.03.0.tar.gz must be downloaded to [path to tarballs]/SLE/.
- SUSE-Products-15-SP3-x86_64-22.03.0.tar.gz must be downloaded to [path to tarballs]/SLE/.
- SUSE-Updates-15-SP3-x86_64-22.03.0.tar.gz must be downloaded to [path to tarballs]/SLE/.
- The steps in this install procedure must be executed as the root user.

**About this task:**

The following procedure details how to install SUSE operating system rpm repositories to Nexus. The install steps are shown on ncn-m001 as an example.

TIP: Ensure that there is adequate disk space where tarballs are located. About 110GB of disk space will be required for all the `tar.gz` files and install operations.

TIP: The tarballs for the SLE OS installation are large and may take a significant amount of time to copy to the system, unpack and install. The time taken depends on the speed of the network, system load, and device speed if an external device, such as a USB drive, is used. It could take up to several hours.

**Perform the Installation:**

1. Start a typescript to capture the commands and output from this installation.

   ```
   ncn-m001# script -af product-os.$(date +%Y-%m-%d).txt
   ncn-m001# export PS1='\u@\H \D{%Y-%m-%d} \t \w # '
   ```

2. Change directory.

   ```
   ncn-m001# cd [path to tarballs]/SLE
   ```

3. Unarchive and uncompress the file SUSE-Backports-SLE-15-SP3-x86_64-22.03.0.tar.gz.

   ```
   ncn-m001# tar -zxf SUSE-Backports-SLE-15-SP3-x86_64-22.03.0.tar.gz
   ```

4. Change directory to SUSE-Backports-SLE-15-SP3-x86_64-22.03.0.

   ```
   ncn-m001# cd SUSE-Backports-SLE-15-SP3-x86_64-22.03.0
   ```

5. Run the Install All program (`install_all.py`) to install all of the tarballs.

   ```
   ncn-m001# ./install_all.py
   ```

6. Exit the typescript file which was started at the beginning of this install procedure.

   ```
   ncn-m001# exit
   ```

**Validate the Installation:**

The install includes a test of the install. Make sure the test was successful. If not successful, a message will flag errors detected and provide materials for analysis.

**Conclude the installation:**

At this point, SLE OS software has been installed. SLE OS content for this release has been uploaded to new hosted Nexus repositories:

SUSE-22.03.0-Backports-SLE-15-SP3-x86_64
SUSE-22.03.0-SLE-Module-Basesystem-15-SP3-x86_64-Debug
SUSE-22.03.0-SLE-Module-Basesystem-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Basesystem-15-SP3-x86_64-PTF
SUSE-22.03.0-SLE-Module-Basesystem-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Containers-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Containers-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Desktop-Applications-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Desktop-Applications-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Development-Tools-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Development-Tools-15-SP3-x86_64-Updates

SUSE-22.03.0-SLE-Module-HPC-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-HPC-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Legacy-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Legacy-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Public-Cloud-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Public-Cloud-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Python2-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Python2-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Server-Applications-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Server-Applications-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Module-Web-Scripting-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Module-Web-Scripting-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Product-HPC-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Product-HPC-15-SP3-x86_64-Updates SUSE-22.03.0-SLE-Product-SLES-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Product-SLES-15-SP3-x86_64-Updates
SUSE-22.03.0-SLE-Product-WE-15-SP3-x86_64-Pool
SUSE-22.03.0-SLE-Product-WE-15-SP3-x86_64-Updates

Refer to the HPE Cray EX System Software Getting Started Guide (S-8000) on the HPE Customer Support Center: https://www.hpe.com/support/ex-gsg to determine the next steps for initial installation or upgrade.

If this is part of an initial installation, the updated SLE OS rpms will be deployed to the system as part of the installation workflow, documented in the *HPE Cray EX System Software Getting Started Guide*.

If this is part of an upgrade, the SLE OS software is consumed by other products as they are deployed. Refer to the illustration in "EX software upgrade workflow" in *HPE Cray EX System Software Getting Started Guide* to see how the SLE OS software is consumed by other products.

# 4    Documentation Conventions

Several conventions have been used in the preparation of this documentation.

- Markdown Format
- File Formats
- Typographic Conventions
- Command Prompt Conventions which describe the context for user, host, directory, chroot environment, or container environment

## 4.1    Markdown Format

This documentation is in Markdown format. Although much of it can be viewed with any text editor, a richer experience will come from using a tool which can render the Markdown to show different font sizes, the use of bold and italics formatting, inclusion of diagrams and screen shots as image files, and to follow navigational links within a topic file and to other files.

There are many tools which can render the Markdown format to get these advantages. Any Internet search for Markdown tools will provide a long list of these tools. Some of the tools are better than others at displaying the images and allowing you to follow the navigational links.

## 4.2    File Formats

Some of the installation instructions require updating files in JSON, YAML, or TOML format. These files should be updated with care because some file formats do not accept tab characters for indentation of lines. Only space characters are supported. Refer to online documentation to learn more about the syntax of JSON, YAML, and TOML files.

## 4.3    Typographic Conventions

`This style` indicates program code, reserved words, library functions, command-line prompts, screen output, file/path names, and other software constructs.

 (backslash) At the end of a command line, indicates the Linux shell line continuation character (lines joined by a backslash are parsed as a single line).

## 4.4    Command Prompt Conventions

### 4.4.0.1    Host name and account in command prompts

The host name in a command prompt indicates where the command must be run. The account that must run the command is also indicated in the prompt. - The root or super-user account always has the # character at the end of the prompt - Any non-root account is indicated with account@hostname>. A non-privileged account is referred to as user.

### 4.4.0.2    Node abbreviations

The following list contains abbreviations for nodes used below

- CN - compute Node
- NCN - Non Compute Node
- AN - Application Node (special type of NCN)
- UAN - User Access Node (special type of AN)
- PIT - Pre-Install Toolkit (initial node used as the inception node during software installation booted from the LiveCD)

| Prompt | Description |
| --- | --- |
| ncn# | Run the command as root on any NCN, except an NCN which is functioning as an Application Node (AN), such as a UAN. |
| ncn-m# | Run the command as root on any NCN-M (NCN which is a Kubernetes master node). |
| ncn-m002# | Run the command as root on the specific NCN-M (NCN which is a Kubernetes master node) which has this hostname (ncn-m002). |
| ncn-w# | Run the command as root on any NCN-W (NCN which is a Kubernetes worker node). |
| ncn-w001# | Run the command as root on the specific NCN-W (NCN which is a Kubernetes master node) which has this hostname (ncn-w001). |
| ncn-s# | Run the command as root on any NCN-S (NCN which is a Utility Storage node). |

| Prompt | Description |
|---|---|
| ncn-s003# | Run the command as root on the specific NCN-S (NCN which is a Utility Storage node) which has this hostname (ncn-s003). |
| pit# | Run the command as root on the PIT node. |
| linux# | Run the command as root on a Linux host. |
| uan# | Run the command as root on any UAN. |
| uan01# | Run the command as root on hostname uan01. |
| user@uan> | Run the command as any non-root user on any UAN. |
| cn# | Run the command as root on any CN. Note that a CN will have a hostname of the form nid124356, that is "nid" and a six digit, zero padded number. |
| hostname# | Run the command as root on the specified hostname. |
| user@hostname> | Run the command as any non-root user son the specified hostname. |

### 4.4.0.3   Command prompt inside chroot

If the chroot command is used, the prompt changes to indicate that it is inside a chroot environment on the system.

```
hostname# chroot /path/to/chroot
chroot-hostname#
```

### 4.4.0.4   Command prompt inside Kubernetes pod

If executing a shell inside a container of a Kubernetes pod where the pod name is $podName, the prompt changes to indicate that it is inside the pod. Not all shells are available within every pod, this is an example using a commonly available shell.

```
ncn# kubectl exec -it $podName /bin/sh
pod#
```

### 4.4.0.5   Command prompt inside image customization session

If using SSH during an image customization session, the prompt changes to indicate that it is inside the image customization environment (pod). This example uses $PORT and $HOST as environment variables with specific settings. When using chroot in this context the prompt will be different than the above chroot example.

```
hostname# ssh -p $PORT root@$HOST
root@POD# chroot /mnt/image/image-root
:/#
```

### 4.4.0.6   Directory path in command prompt

Example prompts do not include the directory path, because long paths can reduce the clarity of examples. Most of the time, the command can be executed from any directory. When it matters which directory the command is invoked within, the cd command is used to change into the directory, and the directory is referenced with a period (.) to indicate the current directory

Examples of prompts as they appear on the system:

```
hostname:~ # cd /etc
hostname:/etc# cd /var/tmp
hostname:/var/tmp# ls ./file
hostname:/var/tmp# su - user
user@hostname:~> cd /usr/bin
user hostname:/usr/bin> ./command
```

Examples of prompts as they appear in this publication:

```
hostname # cd /etc
hostname # cd /var/tmp
hostname # ls ./file
hostname # su - user
user@hostname > cd /usr/bin
user@hostname > ./command
```

#### 4.4.0.7   Command prompts for network switch configuration

The prompts when doing network switch configuration can vary widely depending on which vendor switch is being configured and the context of the item being configured on that switch. There may be two levels of user privilege which have different commands available and a special command to enter configuration mode.

Example of prompts as they appear in this publication:

Enter "setup" mode for the switch make and model, for example:

```
remote# ssh admin@sw-leaf-001
sw-leaf-001>  enable
sw-leaf-001#  configure terminal
sw-leaf-001(conf)#
```

Refer to the switch vendor OEM documentation for more information about configuring a specific switch.