



**Hewlett Packard
Enterprise**

Linux best practices

Using Service Pack for ProLiant (SPP) and Software Delivery Repository (SDR)

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Abstract

Are you a Linux® administrator who must install and update HPE-specific components (drivers, software, and firmware) in a Linux environment? The goal of this paper is to help you understand what options you have for installing and updating these components on HPE ProLiant servers.

In this document, we will focus on environments running either SUSE Linux Enterprise Server or Red Hat® Enterprise Linux. Regional or community Linux distributions may require a Management Component Pack (MCP). An MCP is an OS-specific bundle containing software, utilities, and agents. The MCPs as well as the other enterprise, regional, and community Linux distributions are not the focus of this paper.

After you install the Linux OS using the Linux distribution media, you can choose to install and update your components using any of the following methods or combine them to meet the needs of your environment:

- You can use the drivers that are available in your Linux distribution or kernel updates.
- You can use Smart Update Manager (SUM) to install and update all or selected drivers, software, and firmware components delivered with the Service Pack for ProLiant (SPP) or downloaded from hpe.com/servers/hpsum/download.
- You can use a native software manager to install and update the firmware, driver and software components from the Software Delivery Repository (SDR).

Although we support components that ship with your Linux distribution, this paper focuses on installing and updating your environment using all HPE components found in the SPP and the folders with the SPP components in the SDR. Utilizing the SPP along with distribution-supplied components will help you to get the most benefit of the extra features provided by your ProLiant servers.

What's new

HPE released ProLiant Linux Firmware RPMs starting with Service Pack For ProLiant (SPP) 2015.03.0 (or later). The Firmware RPMs replaced the previous SCEXEs. HPE has taken the contents of the SCEXE and repackaged it into RPM format. This was done to deliver signed firmware components (SCEXEs cannot be signed) and to align to the Linux native package format.

Older firmware will remain in the SCEXE format on the SPP ISO unless a fix or patch is required. If a fix or a patch is required the fixed or patched firmware will be released on HPE.com in RPM format. The SPP ISO will continue to contain protected and non-protected firmware in both RPM and SCEXE format. The Software Delivery Repository (SDR) has two folders: an SPP folder which contains non-password protected RPM firmware and an FWPP folder which contains password protected RPM firmware.

Service Pack for ProLiant (SPP)

The SPP provides the ProLiant server drivers, utilities, management agents and firmware that have been tested together.

The SPP ISO includes:

- A boot environment
- Smart Update Manager (SUM), an SPP deployment tool
- Driver, software, and firmware components for HPE ProLiant servers and infrastructure such as enclosures, Virtual Connect (VC), and Onboard Administrator (OA)

Before each SPP release, we perform integration testing of these components to make sure that we validate firmware, driver, and system software inter-dependencies. You have two options for installing firmware components:

- Use SUM or
- Run the individual Smart Component executable (* .rpm or * .scexe)

Using SUM to install the SPP components

SUM is the deployment engine delivered with the SPP in the `/hp/swpackages` directory. It is also available from the Linux SDR, downloads.linux.hpe.com/sdr, under the Extras link. For information about the prerequisites that you need to run SUM on a supported Linux OS, review the [SUM Release Notes](#).

Key features of SUM include:

- Dependency checking, which ensures appropriate installation order and component readiness
- Web browser-based mode, legacy command-line mode, and text-based console mode and scripting
- Create custom baselines and ISOs
- Simultaneous firmware and software deployment for multiple remote nodes in GUI and CLI modes
- Intelligent deployment of only required updates
- Supports `su` and `sudo`

The latest version of SUM is available on the HPE website at hpe.com/info/hpsum. For details and instructions on using SUM, see the SUM documentation at hpe.com/info/hpsum/documentation.

SUM operating Modes

- GUI
- CLI
- CLI with input file
- Interactive CLI
- Firmware RPM tool

You can use the SUM browser-based graphical user interface (GUI), scriptable command line interface (CLI), or scriptable input file functionality to install drivers, management agents, utilities, and firmware. Use SUM to update firmware, driver, and software components while online or firmware while offline. When in online mode, SUM runs on a system that is configured with a supported Linux operating system. Offline mode is when a single system is booted to the SPP ISO. In offline mode, you can run SUM without user interaction to install all appropriate firmware automatically, or in GUI mode.

GUI

You can use the GUI to deploy packages from an operator's Linux workstation or from the server directly. The utility takes an input of hostnames, connects to these systems through Secure Shell (SSH), checks for existing packages, and then suggests an action for installing or updating SPP components.

CLI

You can use the CLI to install packages from an SPP local bundle on the server.

Use the following SUM CLI commands, which set the silent option, the bundle option, and the verbosity level for the log file, to install the components from the working directory you created:

```
./hpsum --s --b bpXXXXXX.xml --verv
```

You can simulate the install by using the `dryrun` option, which checks for component availability but does not perform the actual updates:

```
./hpsum --s --dryrun --b bpXXXXXX.xml -verv
```

Interactive CLI (iCLI)

iCLI allows you to perform inventory and deploy packages interactively. This can be achieved by issuing specific commands such as:

```
./hpsum add --nodes 192.168.1.1 type=Linux user=user password=password su_user=user1
su_password=password1
./hpsum add --nodes 192.168.1.1 type=Linux user=user password=password use_sudo=true
./hpsum add --baselines "/SPP/" "/tmp/myrepos/"
```

Input file

CLI functionality can be accomplished by putting commands into a single "inputfile" file that you name, and issuing the `--inputfile` command as follows:

```
./hpsum --s --inputfile "filename" --veryv
```

For details and instructions on using SUM, see SUM documentation at hpe.com/info/hpsum/documentation or `hpsum -h`.

Updating firmware from SDR using yum/zypper Firmware RPM Repository

Updating firmware using the new FW RPM Repository Download Manager requires access to the Firmware Pack for ProLiant repository on the SDR. For more information on setting up a repository, see downloads.linux.hpe.com/sdr/project/fwpp. Also see Smart Update Manager User Guide. There is a chapter on this tool: hpe.com/support/hp_sum_ug_en

Command Descriptions

`hpsum requires` Lists PCI devices currently installed on components.

`hpsum list` Shows firmware currently installed on components.

`hpsum upgrade` Initiates flash engine for firmware packages.

`hpsum info` Provides detailed description of installed firmware.

After establishing a Firmware Pack for ProLiant repository, use the following instructions to download and install the firmware RPMs:

1. `yum install $(hpsum requires)`
Press Y when prompted to install applicable RPMs. This stages the firmware RPMs on the local system, but does not flash the firmware.
2. After the RPMs are installed, type:
`hpsum upgrade`
3. Press Y when prompted to begin flashing the firmware update to components. Use the `-y` flag to avoid the prompt.

HPE OS Supplements

We release OS Supplements to align with OSs newly released by the vendor. To provide timely support of new SUSE Linux Enterprise Server and Red Hat Enterprise Linux versions, we may release an OS Supplement to support a new OS version in advance of a scheduled SPP release. The OS Supplement can contain any of the following components that the OS release requires: drivers, software agents, utilities, and firmware. We make the OS Supplement available as a bundle that can be used in conjunction with the SPP to which it aligns.

We offer immediate installation support for each new release of Red Hat Enterprise Linux or SUSE Linux Enterprise Server. However, the HPE Linux Supplement provides HPE value-add deliverables (pre-tested drivers, software agents, utilities, and firmware) and comes out earlier than the standard full SPP.

All OS Supplements are available at the following locations:

- The Service Pack for ProLiant Download page hpe.com/info/spp/download and click on the Release Archive tab
- The SDR downloads.linux.hpe.com/sdr

Please note: SPP components are located in two separate folders on the SDR—the SPP folder and the FWPP folder which contains the HP Passport password protected HPE ProLiant firmware.

SPP Hot Fixes

The SPP Hot Fixes are firmware or software component updates that merit a special release outside the normal SPP component release cycle. We test SPP hot fixes against the current SPP and the SPPs released within the past 12 months. We document details about SPP hot fix in a Customer Advisory (CA). The CA documents the issue that the SPP hot fix addresses and the changes we made to address it.

You are not required to install SPP Hot Fixes. You can choose to install only the SPP Hot Fixes that are appropriate for your environment. SPP Hot Fixes are exceptions—they do not occur frequently and you only need to adopt them if it addresses an issue that you are encountering. We support SPP Hot Fixes as part of the SPP on the SDR.

You can find the SPP Hot Fixes and the corresponding CAs by selecting the Hot Fixes & Advisories tab on the SPP download page hpe.com/info/spp/download. To determine if an SPP Hot Fix applies to your environment, review the CA before downloading the Hot Fix.

The SPP Hot Fix deploys only to any servers running components associated with the specific Hot Fix.

Software Delivery Repository (SDR)

The SDR is a network repository that you can access for driver, software and firmware updates. It contains only the Linux based components as in the SPP. Upon release of a new SPP, we update the SDR to include the drivers, utilities, management agents, and firmware (most firmware is in *.rpm format but a few will continue to be produced in *.scexe format) from the SPP release. This ensures that SPP and SDR contents are identical.

You can access SDR components using a dependency-resolving installation tool. Table 1 lists the installation tool each Linux distribution provides.

Table 1. Installation tools for installing SDR components

OS	Tool
Red Hat Enterprise Linux	Yellowdog Updater, Modified (YUM)
SUSE Linux Enterprise Server	Zypp system management (Zypper)

You can access HPE components for your Linux environment through the SDR at downloads.linux.hpe.com/sdr.

Installing components from the SDR

You choose how to install components from the SDR:

- You can use a dependency-resolving installation tool to install components directly from the SDR.
- You can integrate components from the SDR into your Linux build and configuration management processes and tools.
- You can integrate the component installation directly into your bare metal installation process and into normal update.

Using a script to install the SDR components

We recommend using the HPE script `add_repo.sh` to simplify the process of configuring your target system. Once created, you can transport the configuration to other similar systems and distribute it through normal configuration management processes.

After modifying your target system to point to the SDR, use the distribution-specific installation tool to install the components. For example, to install the health agents on the latest Red Hat Enterprise Linux system, type:

```
yum install hp-health
```

If needed, and assuming your target system has access to the Linux distribution through other configured repositories, any needed dependencies for the HPE components should get resolved automatically. After installing the components, you can configure them as necessary for your environment.

To configure SNMP, run the script:

```
hpsnmpconfig
```

`hpsnmpconfig` modifies the configuration file `/etc/snmp/snmpd.conf`, which you can then copy to other servers.

For details about using the dependency-resolving installation tool, including the download for the `add_repo.sh` script, see the [Getting Started Guide](#).

Using SUM as an RPM package

In addition to getting the SUM deliverable from the `/hp/swpackages` directory on the SPP, you can also find `hpsum-*.rpm` in native RPM format on the SDR. There is a version of the `hpsum-*.rpm` for each supported OS and architecture type.

Because the SDR is a yum-based repository, you can search for the SUM package:

```
yum search hpsum
```

Or, immediately install it by executing the following command:

```
yum install hpsum
```

Because the SDR is Web based, you can browse and download the package manually, and then use the RPM to perform the install by executing the following command:

```
rpm -Uvh hpsum-<version>.<OS>.x86_64.rpm
```

There is a plugin for YUM that enables you to download SUM or an RPM package without performing an installation. To use this functionality, you must install the following package:

```
yum-downloadonly
```

To install the “downloadonly” package, use the YUM command:

```
yum install yum-downloadonly
```

After installing the `yum-downloadonly` package, there are two available options to use with YUM:

- To download a RPM file without performing an update, use the option: `downloadonly`
- To specify an alternate directory to store packages, such as `/tmp`, use the option: `downloadaddir=/path/to/dir`

Overview of components

This section provides general information about key HPE-optimized components for your Linux environment. To simplify the distribution of updates to the target server, update only the components necessary for your environment. The following components will meet the needs of most Linux environments:

- hp-health
- hp-snmp-agents
- hpsmh
- hp-smh-templates
- hpssa/hpssacli
- hpdiaqs
- hponcfg

For details about these components, see the “[Management agents](#)” and “[Utilities](#)” sections that follow.

Firmware

The SPP and SDR include all the necessary firmware packages for currently-supported ProLiant servers and blade servers. You must use SUM to install firmware components or directly use the individual firmware Smart Component executables (typically ending in *.rpm with now only a few ending in *.scexe).

Drivers

The SPP and SDR contain the drivers for your ProLiant server. We provide HPE-optimized drivers for SUSE Linux Enterprise Server and Red Hat Enterprise Linux distributions.

The Linux distribution vendors certify drivers that they provide as part of the distribution release or through their driver update process. We provide the vendors' recommendations about what to certify based on versions and features that are necessary to enable our servers for Linux upstream kernel driver versions. We continually work with the Linux distribution vendors to achieve this certification with their drivers and updates.

Unless otherwise directed by vendor documentation, use the drivers included in your distribution's installation media. This makes it easier to perform kernel upgrades later. In cases where HPE proprietary drivers are necessary but not included on vendor media, the drivers must be obtained directly from the SPP or SDR.

The SDR and SPP include the most up to date HPE optimized deliverables, including fixes and enhancements. Because Linux distribution release schedules rarely coincide with our product release schedules, these distributions may not include the latest deliverables. You may choose to update your server immediately after installation using the SDR or SPP, or you can choose to access them only as the need for update arises. HPE supports you regardless whether you choose to use the in-distribution drivers or HPE drivers.

At this time, we provide Linux drivers in binary RPM Package Manager (RPM) format. The binary RPM files have the file extension .rpm and typically have either kmp or kmod in the filename.

The RPMs contain the dependency requirement definitions. This facilitates the creation of a SPP RPM repository.

For details about using YUM or Zypper see the [Getting Started Guide](#). You can configure your target system to use the SDR or to mirror the SDR, and then perform your installation from your local copy of the repository.

Management agents

The SPP includes the following management agent packages and other utilities, which may interact with a management console so that you can view alerts or query server hardware status.

If you want to install the health agents and have them report to an SNMP console, such as System Insight Manager (SIM), you should install the following SPP components:

- System Health Application and Command Line Utilities (hp-health) package: hp-health collects and monitors important operational data on ProLiant servers and blade servers. Contained within the hp-health package are the following components:
 - Health Monitor: A utility for logging messages to the IML when an Automatic Server Recovery (ASR) event occurs.
 - HP Integrated Management Logging (IML) utility (hplog): A utility for recording messages in the IML.
 - HP Unique Identifier utility (hpuid): A scriptable command line tool for managing and monitoring ProLiant servers and blade servers through the system health monitor daemon (hpsmdorhpasmxld).
 - HP ProLiant Boot Configuration Utility (hpbootcfg): An application to set which device to boot from on the next boot of the system. This can be a permanent change or a “one time” boot change.
 - HP Management CLI (hpsmcli): A scriptable CLI for interacting with the hpsm management daemons.
- Insight Management SNMP Agents for HPE ProLiant Systems (hp-snmpp-agents): A collection of SNMP protocol-based agents and tools that enable monitoring of fans, power supplies, temperature sensors, and other management events through SNMP. It also provides the following:
 - Server Agents (consist of Server Peer Agent, Host OS Agent, Threshold Agent, Standard Equipment Agent, and System Health Agent)
 - Storage Agent (consists of IDA, IDE, SCSI, SAS, and FCA Agents, and Event Agent)
 - Network Agent
- System Management Homepage (hpsmh): A Web-based interface that aggregates and displays server data for single server management.
- HP System Management Homepage Templates for Linux (hp-smh-templates): Contains the System Management Homepage templates for server, management processor, NIC, and storage subsystems. The templates are a collection of html, javascript, and php files that act as a GUI to display much of the SNMP data that the subsystem agents provide. To serve the pages to the browser, you must also install the hp-snmpp-agents package and the hpsmh package.
- HPE Agentless Management Service (hp-ams): Newer HPE ProLiant servers include the HPE iLO 4 management processor, which is the foundation of HPE Agentless Management. With the iLO 4 management processor capabilities, you can monitor and manage core hardware without SNMP agents.

hp-ams furnishes the iLO 4 management processor with OS-specific information, bringing the reporting on par with hp-health and hp-snmpp-agents.

Without hp-ams, the iLO 4 management processor provides hardware health reporting that you can view on the System Management Homepage.

For details on ProLiant Agentless Management, visit the [HPE Agentless Management page](#).

Utilities

The SPP includes the following utilities that allow you to maximize the features of your server:

- cpqacuxe: A utility for configuring HPE Smart Array controllers used by the System Management Homepage (hpsmh).
- hponcfg: A command line utility for configuring iLO from within the OS without requiring a server reboot.
- hpssa/hpssacli: A command line utility for configuring HPE Smart Array controllers.
- fibretutils: Utilities and scripts for HPE-supported Fibre Channel HBAs.
- hp-fc-enablement: Emulex and QLogic utilities for SAN management.

Getting support for components

We support all of the drivers, utilities, management agents, and firmware that are available in the SPP and SDR. We also support all of the HPE-optimized drivers available in the SUSE Linux Enterprise Server or Red Hat Enterprise Linux distributions. You have the choice to use none, some, or all of the components from any of these sources.

Unless the Red Hat or SUSE Technical Exception matrices note an exception, you can receive technical support for contents of an SPP for a maximum of one year from the SPP version (release date), not one year from the SPP installation. For example, if you installed the contents of SPP 2016.04.0, your support period will end on April 30, 2017.

Detailed information on the SPP support policy is available at hpe.com/info/spp.

Review the Red Hat and SUSE technical exceptions at [HPE Servers Support & Certification Matrices](#).

The Release Notes list the Linux OS versions that each SPP or SPP Linux Supplement supports. The Release Notes are available on the SDR at downloads.linux.hpe.com or on the SPP download page at hpe.com/info/spp/download.

Conclusion

You can obtain and install HPE drivers, utilities, and firmware for SUSE Linux Enterprise Server and Red Hat Enterprise Linux distributions from the SPP or the SDR. You choose whichever alternative works best for you or combine them to meet the needs of your environment. No matter which method you choose, we give you the freedom to decide what works best for your environment.

Resources

Smart Update Home Page
hpe.com/info/smartupdate

Service Pack for ProLiant
hpe.com/info/spp

Service Pack for ProLiant Download
hpe.com/info/spp/download

Smart Update Manager product page
hpe.com/servers/smartupdatemanager

SUM download page
hpe.com/info/hpsum/download

Service Pack for ProLiant Information Library
hpe.com/info/spp/docs

Smart Update Manager Information Library
hpe.com/info/hpsum/documentation

HPE ProLiant Linux site
hpe.com/info/proliantlinux

Linux SDR
downloads.linux.hpe.com/sdr/project/hpsum/



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