



# 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 Gen10 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/sum/download](http://hpe.com/servers/sum/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 /packages directory. It is also available from the Linux SDR, [downloads.linux.hpe.com/sdr](http://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/servers/sum](http://hpe.com/servers/sum). For details and instructions on using SUM, see the SUM documentation at [hpe.com/servers/sum/documentation](http://hpe.com/servers/sum/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:

```
./smartupdate --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:

```
./smartupdate --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:

```
./smartupdate add --nodes 192.168.1.1 type=Linux user=user password=password su_user=user1  
su_password=password1
```

```
./smartupdate add --nodes 192.168.1.1 type=Linux user=user password=password use_sudo=true
```

```
./smartupdate 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:

```
./smartupdate --s --inputfile “filename” --veryv
```

For details and instructions on using SUM, see SUM documentation at [hpe.com/servers/sum/documentation](http://hpe.com/servers/sum/documentation) or `smartupdate -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](http://downloads.linux.hpe.com/sdr/project/fwpp). Also see Smart Update Manager User Guide: [hpe.com/support/hp\\_sum\\_ug\\_en](http://hpe.com/support/hp_sum_ug_en). There is a chapter, HPE Firmware Pack for ProLiant at page 25.

Command descriptions

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

`smartupdate list` Shows firmware currently installed on components.

`smartupdate upgrade` Initiates flash engine for firmware packages.

`smartupdate 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:

```
smartupdate 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](http://hpe.com/info/spp/download)
- The SDR [downloads.linux.hpe.com/sdr](http://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 HPE 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 Fixes in a Customer Advisory (CA). The CA documents the issue that the SPP Hot Fixes 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](http://hpe.com/info/spp/download). To determine if an SPP Hot Fixes applies to your environment, review the CA before downloading the Hot Fixes.

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



## 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](https://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.

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.

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 /packages directory on the SPP, you can also find `sum-*.rpm` in native RPM format on the SDR. There is a version of the `sum-*.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 sum
```

Or, immediately install it by executing the following command:

```
yum install sum
```

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 sum-<version>.<OS>.x86_64.rpm
```

There is a plug-in 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: `downloaddir=/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:

- `amsd`
- `ssa/ssacli/ssaducli`
- `hponcfg`

For details about these components, see the “[Management component](#)” 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_00_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 component

The SPP includes the following management component packages and other utilities, which allow you to view alerts or query server hardware status.

If you want your ProLiant server reports to an SNMP console, such as System Insight Manager (SIM), you should install the following SPP components:

- HPE Agentless Management Service daemon (`amsd`):  
HPE ProLiant Gen10 servers include the HPE iLO 5 management processor, which is the foundation of HPE Agentless Management. With the iLO 5 management processor capabilities, you can monitor and manage core hardware without SNMP agents. `amsd` furnishes the iLO 5 management processor with OS-specific information, bringing the reporting on par with `hp-health` and `hp-snmp-agents`.



OS data collected by the amsd includes:

- Host OS name and version
- Host network IP addresses
- Drivers and firmware versions of installed software
- Information about disk drives directly attached to the chipset (not using a Smart Array Controller)

Without amsd, the iLO 5 management processor provides hardware health reporting that you can view on the System Insight Manager (SIM).

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

HPE ProLiant Gen10 series servers will use [RESTful API](#) in place of System Health Application and Command Line Utilities (hp-health) package. There is a technical white paper “Using RESTful API in place of HP Management CLI (hpsasmcli),” which indicates every hpsasmcli command and the corresponding RESTful API command.

HPE ProLiant Gen10 series servers will use [HPE Integrated Lights Out \(iLO\)](#) in place of HPE Insight Diagnostics (hpdiaags) for survey, diagnosis, and test needs. Please reference this [CUSTOMER NOTICE](#) for detailed information.

## Utilities

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

- HPE Smart Storage Administrator (HPE SSA):  
HPE SSA is the main tool for configuring arrays on Smart Array controllers. It exists in three interface formats: the HPE SSA GUI (ssa), the HPE SSA CLI (ssacli), and HPE SSA Diagnostics Utility CLI (ssaducli). HPE Smart Storage Administrator Diagnostics Utility CLI provides the diagnostic features in HPE SSA.

Starting with HPE SSA and ProLiant Gen10 servers and server blades, HPE SSA is accessible both offline and online:

- Accessing HPE SSA in the offline environment:

Using one of multiple methods, you can run HPE SSA before launching the host operating system.

In offline mode, users can configure or maintain detected and supported ProLiant devices, such as optional Smart Array controllers and integrated Smart Array controllers.

Some HPE SSA features are only available in the offline environment, such as setting the boot controller and boot volume.

- Accessing HPE SSA in the online environment:

This method requires an administrator to download the HPE SSA executables and install them.

You can run HPE SSA online after launching the host operating system.

- hponcfg: A command line utility for configuring iLO from within the OS without requiring a server reboot. For more detailed information, please reference [HPE iLO 5 Scripting and Command Line Guide](#).
- fibreutils: 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](http://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](http://downloads.linux.hpe.com) or on the SPP download page at [hpe.com/info/spp/download](http://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.

## Learn more at

Smart Update Home Page  
[hpe.com/info/smartupdate](http://hpe.com/info/smartupdate)

Service Pack for ProLiant  
[hpe.com/info/spp](http://hpe.com/info/spp)

Service Pack for ProLiant download  
[hpe.com/info/spp/download](http://hpe.com/info/spp/download)

Smart Update Manager product page  
[hpe.com/servers/sum](http://hpe.com/servers/sum)

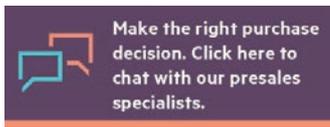
SUM download page  
[hpe.com/servers/sum/download](http://hpe.com/servers/sum/download)

Service Pack for ProLiant Information Library  
[hpe.com/info/spp/docs](http://hpe.com/info/spp/docs)

Smart Update Manager Information Library  
[hpe.com/servers/sum/documentation](http://hpe.com/servers/sum/documentation)

HPE ProLiant Linux site  
[hpe.com/info/proliantlinux](http://hpe.com/info/proliantlinux)

Linux SDR  
[downloads.linux.hpe.com/sdr/project/hpsum/](http://downloads.linux.hpe.com/sdr/project/hpsum/)



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