Technical white paper

Linux best practices using HP Service Pack for ProLiant (SPP) and Software Delivery Repository (SDR)

Table of contents

Abstract 2

HP Service Pack for ProLiant (SPP) 2
- Installing the SPP components with HP Smart Update Manager (HP SUM) 2
- HP SUM operating modes 3
- SPP Supplements 3
- SPP Hot Fixes 4

HP Software Delivery Repository (SDR) 4
- Installing components from the SDR 4
- Using a script to install the SDR components 5
- Using HP SUM as an RPM package 5

Overview of components 6
- Firmware 6
- Drivers 6
- Management agents 7
- Utilities 8

Getting support for components 8

Conclusion 8

For more information 8

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Created September 2012.

Abstract

Are you a Linux administrator who must install and update HP-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 HP ProLiant servers and HP blade servers.

We will focus on environments running either SUSE Linux Enterprise Server or Red Hat Enterprise Linux. All other enabled, regional, and community Linux distributions 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 HP Smart Update Manager (HP SUM) to install and update all or selected drivers, software, and firmware components delivered with the HP Service Pack for ProLiant (SPP).
- You can use a dependency-resolving installation tool found in your Linux distribution to install and update the driver and software components from the HP Software Delivery Repository (SDR).

Although we support components that ship with your Linux distribution, this paper focuses on installing and updating your environment using the SPP and 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.

HP Service Pack for ProLiant (SPP)

The SPP replaces the ProLiant Support Pack (PSP) and Smart Update Firmware DVD. It provides the ProLiant server and blade server drivers, utilities, and management agents that were previously available in the PSP. The SPP also includes firmware, which was previously available on the Smart Update Firmware DVD.

The SPP ISO includes:

- A boot environment
- HP Smart Update Manager (HP SUM), the SPP deployment tool
- Driver, software, and firmware components for HP ProLiant servers and blade servers

Before each SPP release, we perform integration testing of these components to make sure that we validate firmware, driver, or system software inter-dependencies.

Installing the SPP components with HP Smart Update Manager (HP SUM)

HP SUM is the deployment tool delivered with the SPP in the `/hp/swpackages` directory. It is also available from the Linux SDR, http://downloads.linux.hp.com/SDR/, under the **Extras** link. For information about the prerequisites that you need to run HP SUM on a supported Linux OS, review the HP SUM Release Notes or SPP Release Notes.

Key features of HP SUM include:

- HP SUM has knowledge of inter-component dependencies. You can deploy components to a single server or one-to-many servers and network-based targets, including:
  - iLOs
  - OAs
  - VC Ethernet
  - Fibre Channel modules
- HP SUM lets you choose which components to update. You can update all components or only the components that you select.

Note that you must use HP SUM to install firmware components or directly use the individual firmware Smart Component executable (named `*.scexe`).

For details and instructions on using HP SUM, see the HP SUM documentation at http://www.hp.com/go/hpsum/documentation.

HP SUM operating modes

You can use the HP SUM GUI, scriptable CLI, or scriptable input file functionality to install drivers, management agents, utilities, and firmware. You can use HP SUM to update while online (firmware, driver, and software components) or offline (for firmware only). Online mode is where HP SUM is running on a system running a supported Linux operating system. Offline mode is when a single system is booted to the SPP ISO. In offline mode, you can run HP 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 (X Window System required). 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 the SPP components.

CLI

You can use the CLI to install packages from an SPP local bundle on the server. To do so, complete the following steps:

1. Extract the SPP into a working directory and edit the SPP description file, `bpXXXXXX.xml`. Specify which packages you want to install by changing the "package install=" stanza as appropriate.
2. If you are installing the hp-snmp-agents package, edit the `ldu_config.xml` file to configure the SNMP parameters. The Linux Deployment Utility (LDU) component of HP SUM assists in the post-installation agent configuration.
3. Use the following HP SUM CLI commands to install the components, according to the xml specification, from the working directory you created:

   ```
   ./hpsum /s /b bpXXXXXX.xml /veryv
   ```

   You can simulate the install by using the dryrun option:

   ```
   ./hpsum /s /dryrun /b bpXXXXXX.xml /veryv
   ```

Input File

Using the input file functionality is similar to using the CLI functionality except you put the commands into a file and issue the command:

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

For details and instructions on using HP SUM, see HP SUM documentation at http://www.hp.com/go/hpsum/documentation or the `CLIHelp.txt` file that is part of the HP SUM file set.

SPP Supplements

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

With each new release of Red Hat Enterprise Linux or SUSE Linux Enterprise Server, we have day zero support for installation of the OS. However, the SPP Linux Supplement provides HP value-add deliverables (pre-tested drivers, software agents, utilities, and firmware) and comes out earlier than the standard SPP.

The SPP Supplement is available at the following locations:

- HP Service Pack for ProLiant Download page http://www.hp.com/go/spp/download
- SPP Release Archive web page http://h18004.www1.hp.com/products/servers/service_packs/en/spparchive.html

- The SDR http://downloads.linux.hp.com/SDR

SPP Hot Fixes

Hot fixes are firmware or software component updates that we review, discuss, and deemed important enough to merit a special release outside the normal SPP component release cycle. Because they address critical issues, we release SPP hot fixes broadly without waiting for final integration testing. We test SPP hot fixes against the current SPP and the SPPs released within the past 12 months. We document details about the SPP hot fix in a Customer Advisories (CA). The CA documents the problem 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 to the SPP. They do not occur frequently and you only need to adopt them if it addresses an issue that your are encountering. We support SPP hot fixes as part of the SPP.

You can find the SPP hot fixes and the corresponding CAs by selecting the **Hot Fixes & Advisories** button on the SPP download page, www.hp.com/go/spp/download. To determine if an SPP hot fix applies to your environment, review the CA before downloading the SPP hot fix.

The SPP hot fix deploys only to any servers running components associated with the specific SPP hot fix.

HP Software Delivery Repository (SDR)

The SDR is a network repository that you can access for driver and software updates. It contains the same components as the SPP. Upon release of a new SPP, we update the SDR to include the drivers, utilities, management agents, and firmware (currently as scexes, but soon to be RPMs) from the SPP release. This ensures that the SPP and SDR contents are identical.

You can access the SDR components using a dependency-resolving installation tool. Table 2 lists the installation tool each Linux distribution provides.

Table 2. 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 HP components for your Linux environment through the SDR at http://downloads.linux.hp.com/SDR.

For more information about the SDR and best practice for integrating with other Linux system management processes, see the following:

- Deployment Framework Best Practices Red Hat Enterprise Linux on HP ProLiant white paper
- Integrating HP Software Delivery Repository Packages with SUSE Linux Enterprise Server Installations, Deploying the HP Software Delivery Repository as an Add-On during Installations of the Linux Operating System
- Integrating HP tools for Linux deployment (HP SIM, STK, SSSTK, Linux COE, and PSP) HOWTO
- Integrating HP Software Delivery Repository with Red Hat Network Satellite™ HOWTO

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 processes.

At this time, with the exception of NIC drivers, we provide Linux drivers in binary RPM Package Manager (RPM) format. The binary RPM have the file extension `.rpm` and typically have either `kmp` or `kmod` in the filename. The NIC drivers are available as source RPMs and have the file extension `src.rpm`.

If obtained from the SDR, you can compile the binary RPMs on a "build machine," and then distribute them to the target servers. The compilation takes place on the build machine so the target server does not need the compilation environment. Before updating NIC drivers using the SPP, the target server must include the compilation environment.

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

In the future, we will transition all SUSE Linux Enterprise Server and Red Hat Enterprise Linux drivers to the Kernel Module Package (KMP) format, delivering binary RPM packages, which will simplify driver installation and support as you upgrade the kernel on the target server.

For details about the compilation environment, see the SPP Release Notes.

For details about using the dependency-resolving installation tool, 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.

Using a script to install the SDR components

We recommend using the HP script, `bootstrap.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 HP components should get automatically resolved. 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 `bootstrap.sh` script, see the Getting Started Guide.

Using HP SUM as an RPM package

In addition to getting the HP 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.

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

```
yum search hpsum
```

Or, immediately install it by executing the following command:

```
yum install hpsum
```

Since the SDR is web based, you can browse and download the package manually, and then utilize the RPM to perform the install by executing the following command:

```
rpm –Uvh hpsum-5.1.0-<version>.<OS>.i386.rpm
```

There is a plugin for YUM that enables you to download HP SUM or an RPM package without performing an installation. In order to utilize 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

The following sections provide general information and information about the key HP-optimized components for your Linux environment. Update only the components necessary for your environment; this simplifies the distribution of the updates to the target server.

We have found that the following components will meet the needs of most Linux environments:

- hp-health
- hp-snmp-agents
- hpsmh
- hp-smh-templates
- hpacucli
- hpdiags
- hponcfg

For details about these components, see the “Management agents” and “Drivers” sections that follow.

For additional details and a comprehensive list of ProLiant Linux software packages, see http://hpedia.hp.com/wiki/Proliant_Linux_Software_Packages.

Firmware

The SPP and SDR include all the necessary firmware packages for currently-supported ProLiant servers and blade servers. You must use HP SUM to install firmware components or directly use the individual firmware Smart Component executables (typically named `*.scexe`).

Drivers

The SPP and SDR contain the drivers that you need for your ProLiant server and blade server. We provide HP-optimized drivers for SUSE Linux Enterprise Server and Red Hat Enterprise Linux distributions.

The Linux distribution vendors certify drivers that they provide. They either do so 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.

Use the drivers included in your distribution’s installation media unless otherwise instructed. This makes it easier to perform kernel upgrades later. In some cases, HP proprietary drivers are necessary. These drivers are not included on the distribution vendor’s media. Obtain HP proprietary drivers directly from the SPP or SDR.

The SDR and SPP include the most up to date HP optimized deliverables, including fixes and enhancements. Since 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. HP supports you regardless whether you choose to use the in-distribution drivers or HP drivers.

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 HP System Insight Manager (HP 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 (hpasmd or hpasmxld).
  - 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 Command Line Interface (hpasmcli) - a scriptable command line interface for interacting with the hpasm management daemons.
- **Insight Management SNMP Agents for HP ProLiant Systems (hp-snmp-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-snmp-agents package and the hpsmh package.
- **HP Agentless Management Service (hp-ams)**: HP ProLiant Gen8 servers include the HP iLO 4 management processor, which is the foundation of HP 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-snmp-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 managing ProLiant servers and blade servers in a Linux environment, see the following resources:

- HP Insight Management Agents 8.70 Managing ProLiant Servers with Linux HOWTO
- Linux Best Management Practices whitepaper

For details on Gen8 Agentless Management, see the following resources:

- The HP iLO4 product page at www.hp.com/go/iLO
- HP ProLiant Gen8 Agentless Management Overview
- Linux Best Management Practices whitepaper
- HP iLO Management Engine technologies technology brief
- HP Systems Insight Manager 7.0 and HP Agentless Management Overview technology brief

Utilities

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

- **cpqacuxe**: A utility for configuring HP 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.
- **hpacucli**: A command line utility for configuring HP Smart Array controllers.
- **fibreutils**: Utilities and scripts for HP-supported Fibre Channel HBAs. Note that Red Hat Enterprise Linux 5.3 requires Fibreutils-3.x (or higher).
- **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 HP-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 install the contents of SPP 2011.09.0, your support period ends on September 30, 2012.

The SPP and the SPP Supplement for Linux support the current Linux version and the previous version for one year, which includes major and minor Linux releases. However, since typical Linux update cycles are 18 months and we support the SPP for one year, there might be SPPs that may not have new content.

For example, an SPP may support:

- Red Hat Enterprise Linux 5.8/5.7 and 6.2/6.1
- SUSE Linux Enterprise Server 11-SP2/11-SP1 and 10-SP4

Review the Red Hat and SUSE technical exceptions at http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html.

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 http://downloads.linux.hp.com/SDR or on the SPP download page at www.hp.com/go/spp/download.

Conclusion

You can obtain and install HP 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 which method works best for your environment.

For more information

Visit the URLs listed below if you need additional information.

Resource description	Web address
HP Systems and Server Software Management	www.hp.com/go/simple-fw-sw
HP Service Pack for ProLiant	www.hp.com/go/spp
HP Service Pack for ProLiant Download	www.hp.com/go/spp/download
HP Service Pack for ProLiant Information Library	www.hp.com/go/spp/documentation
HP Smart Update Manager Information Library	http://www.hp.com/go/hpsum/documentation

HP ProLiant Linux site	www.hp.com/go/proliantlinux
HP Software Delivery Repository	http://downloads.linux.hp.com/SDR/

Get connected

hp.com/go/getconnected

Current HP driver, support, and security alerts
delivered directly to your desktop

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TC1205901, Created in September 2012