The software described in this documentation is either no longer supported or is in extended support.
Oracle recommends that you upgrade to a current supported release.

Spacewalk for Oracle® Linux

Client Life Cycle Management Guide for Release 2.4

E71078-08
November 2019

Oracle Legal Notices

About this document

This document describes how to use Spacewalk 2.4 to provision and manage Spacewalk clients.

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Table of Contents

Preface

Spacewalk for Oracle® Linux: Client Life Cycle Management Guide for Release 2.4 describes how to use the Spacewalk 2.4 web interface and `spacecmd` command-line utility to provision and manage Spacewalk clients.

Audience

This document is written for system administrators who want to use Spacewalk to manage Oracle Linux systems. It is assumed that readers have a general understanding of the Linux operating system.

Related Documents

The documentation for this product is available at:

Spacewalk for Oracle® Linux Documentation

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Chapter 1 Using the Spacewalk Web Interface and the spacecmd Command

You can use either the Spacewalk web interface or the `spacecmd` command to administer Spacewalk.

You can also create your own web and command interfaces by using the Spacewalk XML/RPC API. For more information, see Appendix D, *Spacewalk XML/RPC API*.

For an introduction to the concepts and features of Spacewalk and best practices for using Spacewalk for managing Oracle Linux systems, see *Spacewalk for Oracle® Linux: Concepts Guide for Release 2.4*.

1.1 About the Spacewalk Web Interface

When you install a Spacewalk server, you are prompted to set up the main Spacewalk administrator account.

```
Installation complete.
Visit https://swksvr.mydom.com to create the Spacewalk administrator account.
```

Point your browser at the specified URL, create the account, and log in to Spacewalk.

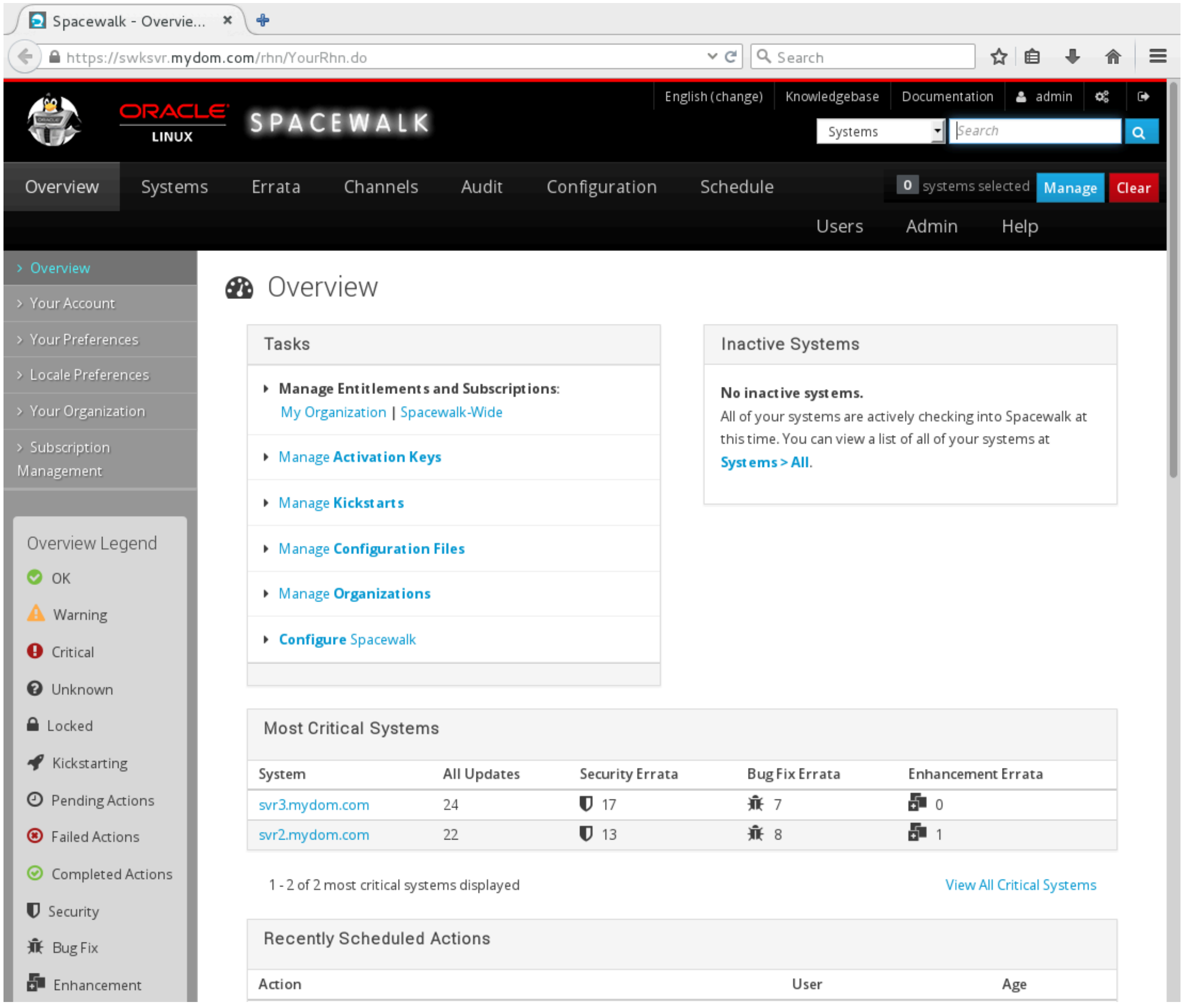
Note

If you are using the self-signed SSL certificate generated during the installation, create an exemption for the Spacewalk server.

The Spacewalk web interface menu header provides the following administrative areas that you can select. The default page for each menu item displays summary information. You can obtain more detailed information or perform actions on the items by selecting items from the left-hand menu or tab views on a page.

Overview

Figure 1.1 Overview Page



Tasks

- **Manage Entitlements and Subscriptions:** My Organization | Spacewalk-Wide
- Manage **Activation Keys**
- Manage **Kickstarts**
- Manage **Configuration Files**
- Manage **Organizations**
- **Configure** Spacewalk

Inactive Systems

No inactive systems.
All of your systems are actively checking into Spacewalk at this time. You can view a list of all of your systems at **Systems > All.**

Most Critical Systems

System	All Updates	Security Errata	Bug Fix Errata	Enhancement Errata
svr3.mydom.com	24	17	7	0
svr2.mydom.com	22	13	8	1

1 - 2 of 2 most critical systems displayed

Recently Scheduled Actions

Action	User	Age

The default Overview page presents a dashboard view of the state of the Spacewalk server. The page displays important information about systems that are inactive or in a critical state, recently scheduled actions, relevant security errata that you can apply to your systems, and lists of system groups and recently registered systems. The page also provides links to administrative tasks that you can perform.

Refer to the Overview Legend pane for the meaning of any icons that the page displays for a system.

To customize the layout of the Overview page:

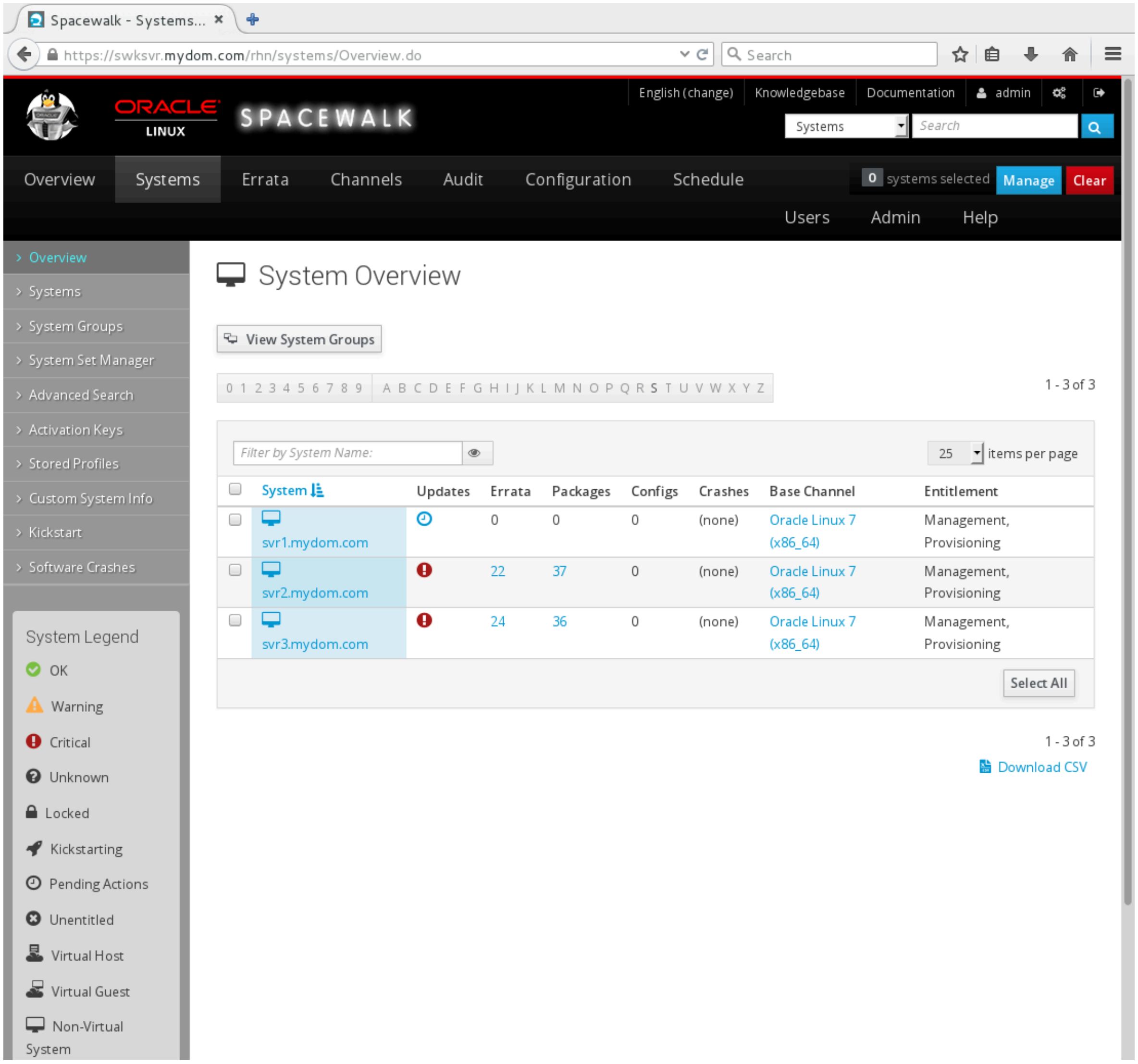
1. Select **Your Preferences**.
2. On the Your Preferences page in the Overview Start Page section, select or deselect the check boxes against the information that you want or do not want to display.

   You can configure other preferences on this page, such as whether to receive email notifications, the number of entries per-page in lists, and the separator character for comma-separated values (CSV) files.

3. To save your changes, click **Save Preferences**.

Systems Tab

Figure 1.2 Systems Overview Page



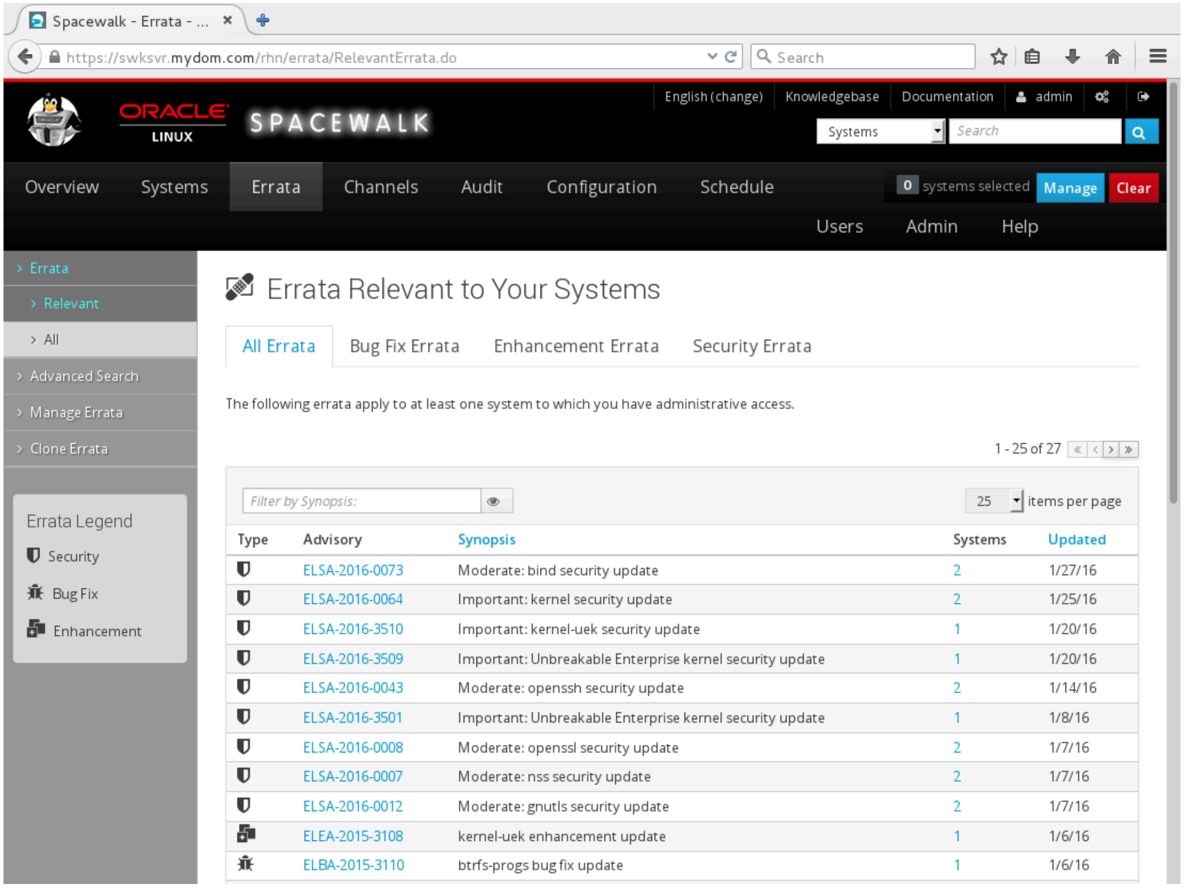
System	Updates	Errata	Packages	Configs	Crashes	Base Channel	Entitlement
svr1.mydom.com	◷	0	0	0	(none)	Oracle Linux 7 (x86_64)	Management, Provisioning
svr2.mydom.com	!	22	37	0	(none)	Oracle Linux 7 (x86_64)	Management, Provisioning
svr3.mydom.com	!	24	36	0	(none)	Oracle Linux 7 (x86_64)	Management, Provisioning

The System Overview page displays a summary of the number of available updates, errata, packages, configuration files and crashes, the name of the base channel, and any entitlements for each managed client system.

Refer to the System Legend pane for the meaning of any icons that the page displays for a system.

Errata Tab

Figure 1.3 Errata Relevant to Your Systems Page



Errata Relevant to Your Systems

The following errata apply to at least one system to which you have administrative access.

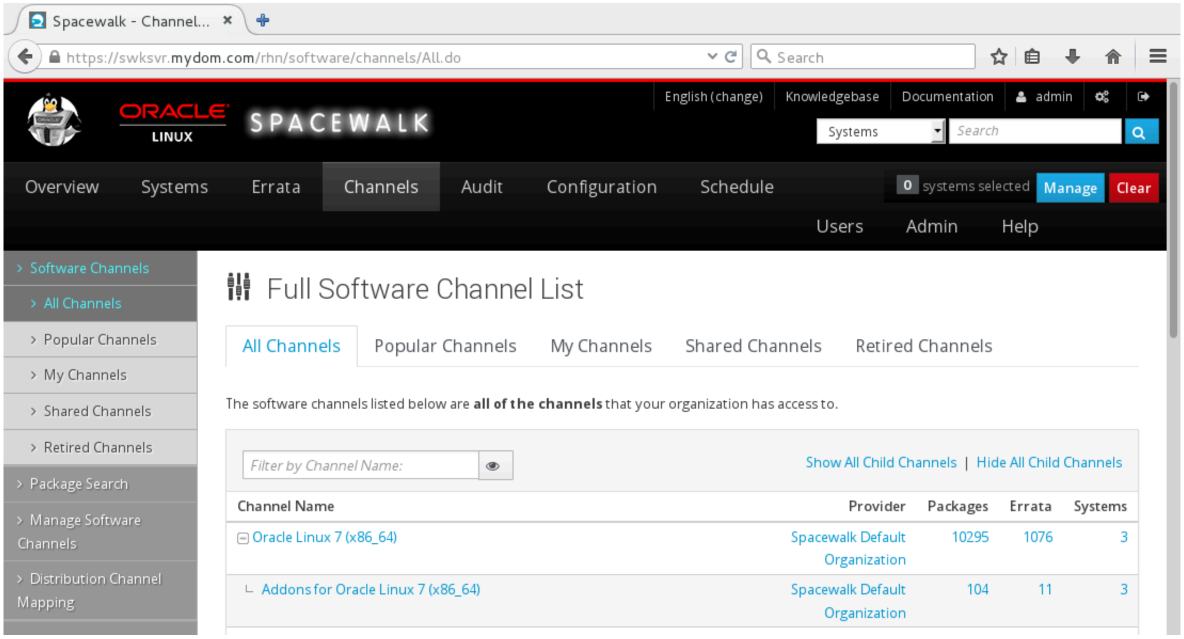
Type	Advisory	Synopsis	Systems	Updated
🛡	ELSA-2016-0073	Moderate: bind security update	2	1/27/16
🛡	ELSA-2016-0064	Important: kernel security update	2	1/25/16
🛡	ELSA-2016-3510	Important: kernel-uek security update	1	1/20/16
🛡	ELSA-2016-3509	Important: Unbreakable Enterprise kernel security update	1	1/20/16
🛡	ELSA-2016-0043	Moderate: openssh security update	2	1/14/16
🛡	ELSA-2016-3501	Important: Unbreakable Enterprise kernel security update	1	1/8/16
🛡	ELSA-2016-0008	Moderate: openssl security update	2	1/7/16
🛡	ELSA-2016-0007	Moderate: nss security update	2	1/7/16
🛡	ELSA-2016-0012	Moderate: gnutls security update	2	1/7/16
▣	ELEA-2015-3108	kernel-uek enhancement update	1	1/6/16
🐞	ELBA-2015-3110	btrfs-progs bug fix update	1	1/6/16

The Errata Relevant to Your Systems page displays information about the errata that are available for your registered systems.

Refer to the Errata Legend pane for the meaning of any icons that the page displays for a system.

Channels Tab

Figure 1.4 Full Software Channel List Page



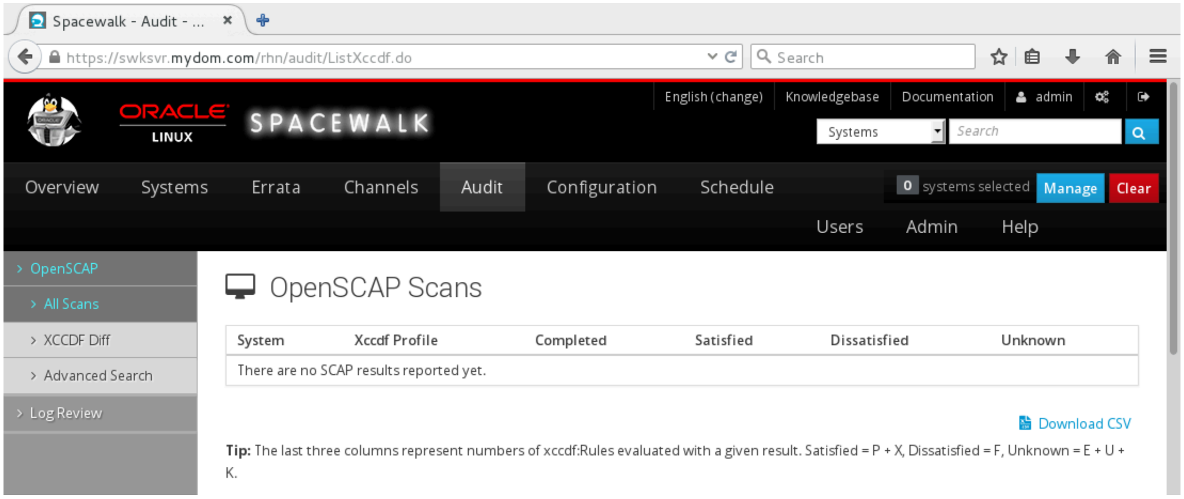
The software channels listed below are **all of the channels** that your organization has access to.

Channel Name	Provider	Packages	Errata	Systems
⊟ Oracle Linux 7 (x86_64)	Spacewalk Default Organization	10295	1076	3
└ Addons for Oracle Linux 7 (x86_64)	Spacewalk Default Organization	104	11	3

The Full Software Channel List page displays the channels to which you can subscribe your registered systems. By default, only the base channels are shown. To display child channels, click the plus sign (**+**) next to the name of the base channel.

Audit Tab

Figure 1.5 OpenSCAP Scans Page



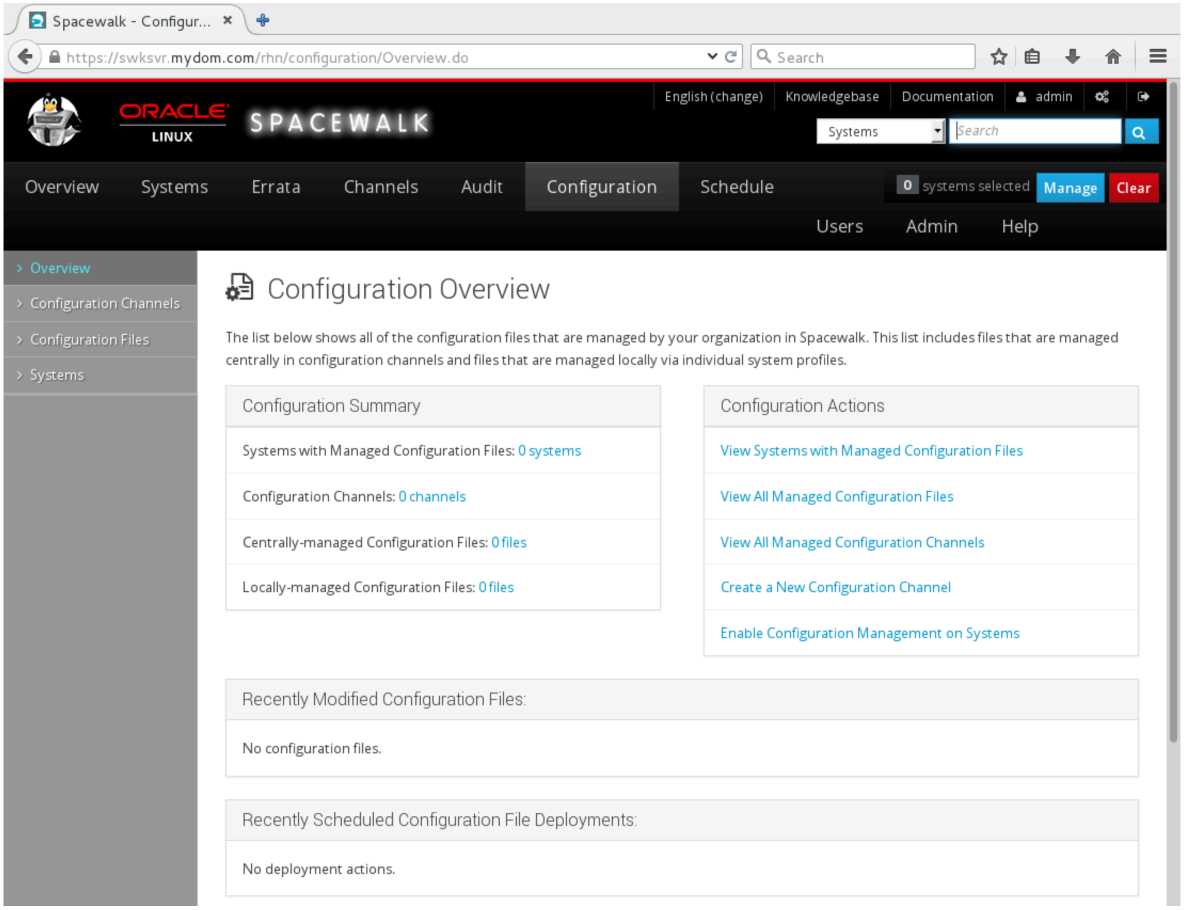
System	Xccdf Profile	Completed	Satisfied	Dissatisfied	Unknown
There are no SCAP results reported yet.					

Tip: The last three columns represent numbers of xccdf:Rules evaluated with a given result. Satisfied = P + X, Dissatisfied = F, Unknown = E + U + K.

The OpenSCAP Scans page displays a summary of any scans that you have performed on your systems.

Configuration Tab

Figure 1.6 Configuration Overview Page



Configuration Overview

The list below shows all of the configuration files that are managed by your organization in Spacewalk. This list includes files that are managed centrally in configuration channels and files that are managed locally via individual system profiles.

Configuration Summary

Systems with Managed Configuration Files: 0 systems

Configuration Channels: 0 channels

Centrally-managed Configuration Files: 0 files

Locally-managed Configuration Files: 0 files

Configuration Actions

View Systems with Managed Configuration Files

View All Managed Configuration Files

View All Managed Configuration Channels

Create a New Configuration Channel

Enable Configuration Management on Systems

Recently Modified Configuration Files:

No configuration files.

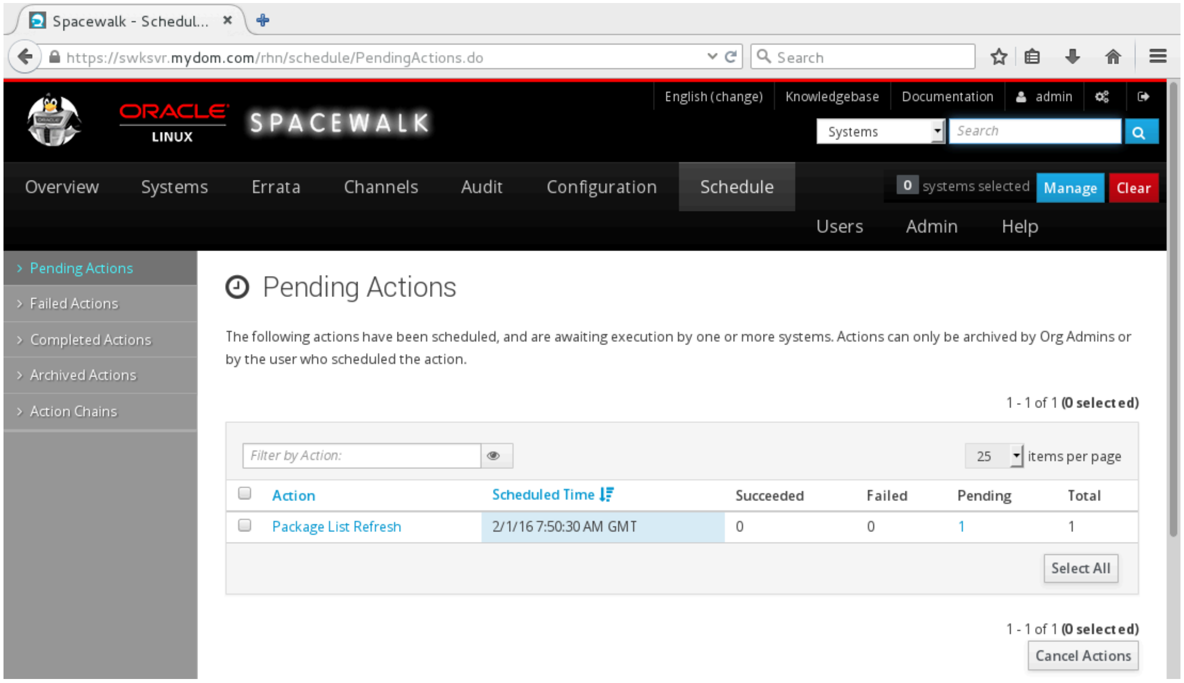
Recently Scheduled Configuration File Deployments:

No deployment actions.

The Configuration Overview page displays a summary of the configuration files that are known to Spacewalk, links to actions you can perform with configuration files, and scheduled deployments of configuration files.

Schedule Tab

Figure 1.7 Pending Actions Page



Pending Actions

The following actions have been scheduled, and are awaiting execution by one or more systems. Actions can only be archived by Org Admins or by the user who scheduled the action.

1 - 1 of 1 (**0 selected**)

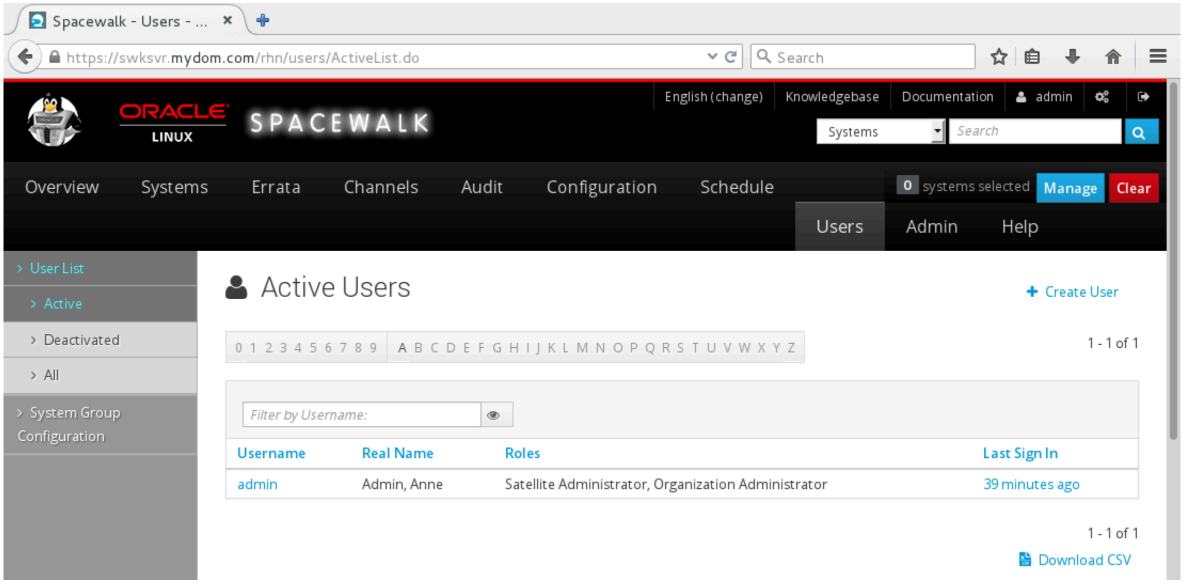
	Action	Scheduled Time	Succeeded	Failed	Pending	Total
□	Package List Refresh	2/1/16 7:50:30 AM GMT	0	0	1	1

1 - 1 of 1 (**0 selected**)

The Pending Actions page displays a list of actions that are scheduled to be performed.

Users Tab

Figure 1.8 Active Users Page



Active Users

1 - 1 of 1

Username	Real Name	Roles	Last Sign In
admin	Admin, Anne	Satellite Administrator, Organization Administrator	39 minutes ago

1 - 1 of 1

The Active Users page displays a list of administrators or other users and their allocated roles.

The Spacewalk Administrator role permits a user to perform all actions in Spacewalk.

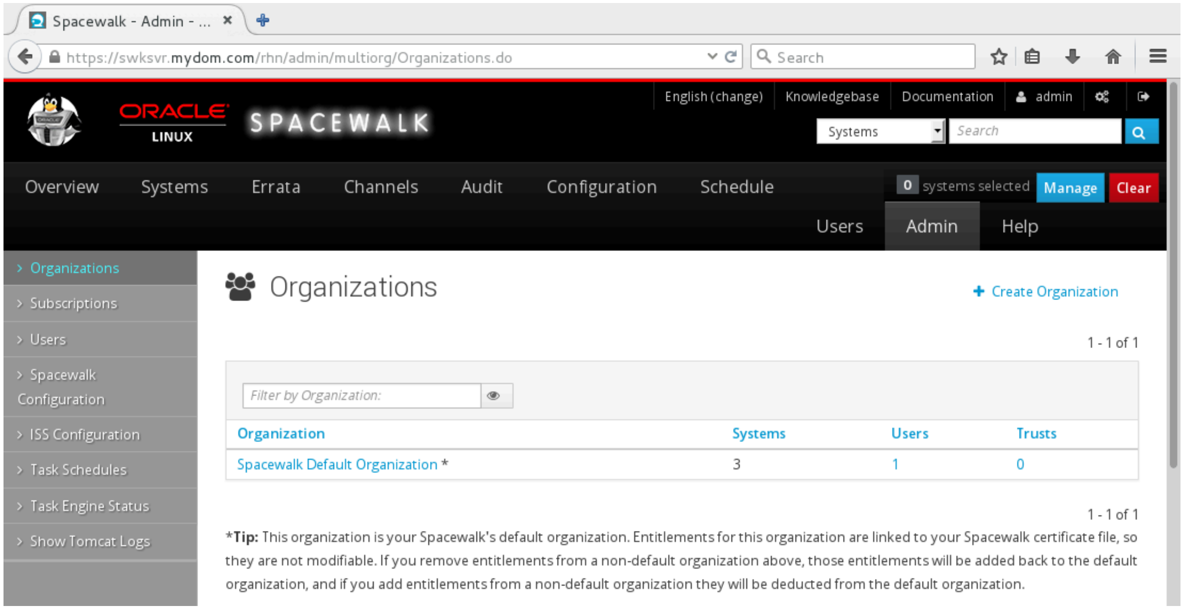
You can configure the Organization Administrator role to grant one or more of the following roles to a user who has administrative access to one or more organizations:

- System Group Administrator
- Channel Administrator
- Activation Key Administrator
- Configuration Administrator
- Monitoring Administrator

A read-only API user has limited access to the XML/RPC API but cannot access the web interface.

Admin Tab

Figure 1.9 Organizations Page



Organization	Systems	Users	Trusts
Spacewalk Default Organization *	3	1	0

1 - 1 of 1

*Tip: This organization is your Spacewalk's default organization. Entitlements for this organization are linked to your Spacewalk certificate file, so they are not modifiable. If you remove entitlements from a non-default organization above, those entitlements will be added back to the default organization, and if you add entitlements from a non-default organization they will be deducted from the default organization.

The Organizations page displays the organizations for which you have configured the Spacewalk server to administer and the number of systems, Spacewalk administrators, and trusts that are configured for the system. If a trust is enabled, you can share content and move systems between organizations.

Note

Oracle recommends that you define at least one Spacewalk organization as soon as you have installed the Spacewalk server, even if you think your deployment does not require organizations. It is difficult to retrofit organizations into a Spacewalk implementation after you have configured the default organization.

1.2 About the spacecmd Command

You can use the `spacecmd` command-line interface (CLI) to perform most of the actions that you perform by using the web interface.

You can run the spacecmd command either directly on the Spacewalk server or remotely. If you run the spacecmd command remotely, you must specify the server by its IP address or by a resolvable domain name.

The following example shows how you would specify the server by its host name:

```
$ spacecmd -s swksvr.mydom.com
Welcome to spacecmd, a command-line interface to Spacewalk.

Type: 'help' for a list of commands
      'help <cmd>' for command-specific help
      'quit' to quit

Spacewalk Username: swadmin
Spacewalk Password: password
INFO: Connected to https://swksvr.mydom.com/rpc/api as swadmin
```

where the values for the host name, Spacewalk user, and password are those that you specified when installing and configuring Spacewalk.

Note

You must authenticate yourself as a Spacewalk user with an assigned role with sufficient privileges for performing the requested actions.

As an alternative to entering the Spacewalk user name and password at the prompts, you can use the -u and -p options to specify these values. Be aware however, that specifying the password on the command line is insecure, as it is visible in command histories and the process list. A more secure method is to create a credentials file, such as ~/.spacecmd/config with mode 400 that contains information that defines the Spacewalk server, user name, and password, as shown in the following example:

```
[spacecmd]
server=swksvr.mydom.com
username=swadmin
password=password
```

Note the following additional information about using the spacecmd CLI:

To display more help about a command, type help command.

To exit the shell, type exit or quit.

spacecmd attempts [Tab] completion of partial commands or arguments.

You can run spacecmd as an interactive shell or non-interactively. This guide includes examples of using the interactive shell. If you want to run spacecmd non-interactively, specify the spacecmd shell command and its arguments after a -- delimiter, for example:

```
$ spacecmd -- softwarechannel_create -l oraclelinux7-x86_64-ksplice \
  -n "Oracle Linux 7 x86_64 Ksplice Channel" -p oraclelinux7-x86_64 -a x86_64
INFO: Connected to https://swksvr.mydom.com/rpc/api as swadmin
$ spacecmd -q -- softwarechannel_list
INFO: Connected to https://swksvr.mydom.com/rpc/api as swadmin
oraclelinux7-x86_64
oraclelinux7-x86_64-addons
oraclelinux7-x86_64-ksplice
oraclelinux7-x86_64-optional
```

```
oraclelinux7-x86_64-patch
oraclelinux7-x86_64-spacewalk24-client
oraclelinux7-x86_64-spacewalk24-server
oraclelinux7-x86_64-uek-r3
oraclelinux7-x86_64-uek-r4
$ spacecmd -q -y -- softwarechannel_delete oraclelinux7-x86_64-ksplice
Channels
--------
oraclelinux7-x86_64-ksplice
$ spacecmd -q -- softwarechannel_list
oraclelinux7-x86_64
oraclelinux7-x86_64-addons
oraclelinux7-x86_64-optional
oraclelinux7-x86_64-patch
oraclelinux7-x86_64-spacewalk24-client
oraclelinux7-x86_64-spacewalk24-server
oraclelinux7-x86_64-uek-r3
oraclelinux7-x86_64-uek-r4
```

The `-q` option suppresses informational messages. The `-y` option specifies that you would answer **yes** to all prompts to confirm that you want to delete or change data. By default, `spacecmd` assumes the answer **no**.

For more information, see the `spacecmd(1)` manual page.

Chapter 2 Creating Software Channels and Repositories

This chapter describes how to create software channels in Spacewalk to which client systems can subscribe and obtain packages and errata. Each channel is associated with at least one repository, which defines the source of the packages and errata. The examples shown in this section are for the Unbreakable Linux Network (ULN) and the Oracle Linux yum server but you can use Spacewalk to obtain software packages from other external or internal sources.

2.1 About Channel Configuration

ULN provides an `olN_arch_latest` repository, which includes all packages for an Oracle Linux release. It also provides `base` and `patch` channels for each update of an Oracle Linux release. Depending on the Oracle Linux release, other channels might provide the latest packages for additional features such as DTrace user-space, Ksplice, and OFED.

The Oracle Linux yum server provides a `public_olN_latest` repository, which includes all packages for an entire Oracle Linux release in addition to a `public_olN_un_base` repository for each update. Unlike ULN, the Oracle Linux yum server does not provide `patch` channels for updates.

Some channels, such as those for Spacewalk Client and Spacewalk Server, are available on the Oracle Linux yum server but not on ULN. Other channels, such as those for DTrace user-space, Ksplice, and OFED packages, are available on ULN but not on the Oracle Linux yum server.

Oracle recommends that you design a channel configuration that is based on your own work flow. For example, if you intend to use Spacewalk's channel cloning feature to promote systems from development through testing to production, you could configure a `base` channel and child `patch` channel together with other child channels.

Avoid cloning `latest` channels as this takes a long time given that these channels are usually very large. If you duplicate child channels, you do not need to duplicate their repositories. These channels can use the same repositories as the channel from which they were cloned. For example, each cloned base channel might have a unique `addons` child channel, but each of these child channels would use the same repository. The packages are not duplicated, even though they are referenced in multiple channels.

If necessary, you can maintain the `latest` channels separately without subscribing any systems to these channels. If the need arises, you can copy errata packages form the `latest` channels to the `patch` channels to make the latest fixes available.

Note

You do not need to associate a software channel with a repository if you want to create custom channels that obtain their packages by methods such as `rhnpush` or uploading via the web interface, which allow you to serve locally developed and packaged software that has no upstream repository.

2.2 Configuring Software Channels for ULN

Spacewalk contains a ULN plug-in for the `spacewalk-repo-sync` tool. The plug-in enables you to synchronize software channels without having to register the Spacewalk server with ULN.

To configure the ULN plug-in:

1. Change the mode of `/etc/rhn/spacewalk-repo-sync/uln.conf` to 600 (read-write).

   ```
   # chmod 600 /etc/rhn/spacewalk-repo-sync/uln.conf
   ```

2. Edit `/etc/rhn/spacewalk-repo-sync/uln.conf` and add your SSO login user name and password for ULN:

   ```
   [main]
   username=ULN_SSO_username
   password=ULN_SSO_password
   ```

3. Change the mode of `/etc/rhn/spacewalk-repo-sync/uln.conf` to 400 (read-only).

   ```
   # chmod 400 /etc/rhn/spacewalk-repo-sync/uln.conf
   ```

> **Important**
>
> To protect your ULN credentials, verify that `/etc/rhn/spacewalk-repo-sync/uln.conf` is read-only (file mode 0400) by `root`.
>
> ```
> # ls -l /etc/rhn/spacewalk-repo-sync/uln.conf
> -r--------. 1 root root 56 Feb  2 14:44 /etc/rhn/spacewalk-repo-sync/uln.conf
> ```

When you have configured the ULN plug-in, you can use either the Spacewalk web interface, `spacecmd`, or `spacewalk-common-channels` to create the Spacewalk software channels, repositories, and activation keys:

- Section 2.5, “Working with Software Channels”

> **Tip**
>
> Although the `spacewalk-common-channels` command configures software channels to access the Oracle Linux yum server, you can reconfigure the repository entries to access ULN instead. For example, if you want to use the Oracle Linux `base` and `patch` channels for an Oracle Linux release update on ULN, you can reconfigure the base software channel to access the `base` channel and create an additional child channel and associated repository entry for the `patch` channel.
>
> See Section 2.3, “Configuring Software Channels to Obtain Packages from the Oracle Linux Yum Server”.

- Section 2.4, “Working with Repositories”
- Chapter 3, *Creating Activation Keys*

Once you have set up the software channels and repositories, download the packages by synchronizing the software channels with ULN. See Section 2.6, “Synchronizing Software Channels”.

2.3 Configuring Software Channels to Obtain Packages from the Oracle Linux Yum Server

You can use the `spacewalk-common-channels` utility in the `spacewalk-utils` package to configure software channels that use the Oracle Linux yum server. You can use this utility to configure the software channels, repositories, GPG keys, and activation keys for Oracle Linux 5, Oracle Linux 6, and Oracle Linux 7.

To list the available channels, use the `--list` option, for example:

```
# spacewalk-common-channels --list | grep "^ oracle"
 oraclelinux5:        i386, x86_64
 oraclelinux5-addons: i386, x86_64
 oraclelinux5-oracle-addons: i386, x86_64
 oraclelinux5-spacewalk22-client: i386, x86_64
 oraclelinux5-spacewalk24-client: i386, x86_64
 oraclelinux5-uek:    i386, x86_64
 oraclelinux5-unsupported: i386, x86_64
 oraclelinux6:        i386, x86_64
 oraclelinux6-addons: i386, x86_64
 oraclelinux6-mysql55: i386, x86_64
 oraclelinux6-mysql56: i386, x86_64
 oraclelinux6-mysql57: i386, x86_64
 oraclelinux6-playground: x86_64
 oraclelinux6-scl12:  x86_64
 oraclelinux6-spacewalk22-client: i386, x86_64
 oraclelinux6-spacewalk22-server: x86_64
 oraclelinux6-spacewalk24-client: i386, x86_64
 oraclelinux6-spacewalk24-server: x86_64
 oraclelinux6-uek:    i386, x86_64
 oraclelinux6-uek-r3: x86_64
 oraclelinux6-uek-r4: x86_64
 oraclelinux7:        x86_64
 oraclelinux7-addons: x86_64
 oraclelinux7-mysql55: x86_64
 oraclelinux7-mysql56: x86_64
 oraclelinux7-mysql57: x86_64
 oraclelinux7-openstack20: x86_64
 oraclelinux7-optional: x86_64
 oraclelinux7-scl12:  x86_64
 oraclelinux7-spacewalk22-client: x86_64
 oraclelinux7-spacewalk24-client: x86_64
 oraclelinux7-spacewalk24-server: x86_64
 oraclelinux7-uek-r3: x86_64
 oraclelinux7-uek-r4: x86_64
```

Note

Unlike ULN, the Oracle Linux yum server does not provide patch channels for each update of an Oracle Linux release. Instead, `spacewalk-common-channels` configures the base (parent) software channel to use the `public_olN_latest` repository, which includes all packages for the entire release.

Some ULN channels, such as those for DTrace userspace, Ksplice, and OFED, are not available on the Oracle Linux yum server.

For example, create the software channels for Oracle Linux 7 (x86_64):

```
# spacewalk-common-channels -v -u swadm -p swadm_passwd -a x86_64 -k unlimited 'oraclelinux7*'
Connecting to http://localhost/rpc/api
Base channel 'Oracle Linux 7 (x86_64)' - creating...
* Activation key 'oraclelinux7-x86_64' - creating...
* Child channel 'Oracle Linux 7 Addons (x86_64)' - creating...
** Activation key '1-oraclelinux7-x86_64' - adding child channel...
* Child channel 'Oracle Linux 7 MySQL 5.5 (x86_64)' - creating...
** Activation key '1-oraclelinux7-x86_64' - adding child channel...
* Child channel 'Oracle Linux 7 MySQL 5.6 (x86_64)' - creating...
** Activation key '1-oraclelinux7-x86_64' - adding child channel...
* Child channel 'Oracle Linux 7 MySQL 5.7 (x86_64)' - creating...
** Activation key '1-oraclelinux7-x86_64' - adding child channel...
...
```

swadm and *swadm_passwd* are the user name and password of the Spacewalk administrator. The -k unlimited option specifies that the command should create an activation key with no limit on the number of servers with which you can use it.

You can use either the Spacewalk web interface or spacecmd to display, modify, or delete the available channels, repositories, and activation keys:

- Section 2.5, “Working with Software Channels”
- Section 2.4, “Working with Repositories”
- Chapter 3, *Creating Activation Keys*

Once you have set up the software channels and repositories, download the packages by synchronizing the software channels with the Oracle Linux yum server. See Section 2.6, “Synchronizing Software Channels”.

2.3.1 Oracle Linux 7 software channels

The following table lists the Oracle Linux 7 (x86_64) software channels that you can set up using spacewalk-common-channels:

Software Channel	Description
oraclelinux7	Base channel for Oracle Linux 7
oraclelinux7-addons	Add-on packages
oraclelinux7-mysql55	MySQL 5.5 packages
oraclelinux7-mysql56	MySQL 5.6 packages
oraclelinux7-mysql57	MySQL 5.7 packages
oraclelinux7-openstack20	OpenStack 2.0 packages
oraclelinux7-optional	Optional packages
oraclelinux7-scl12	Software Collections 1.2 packages
oraclelinux7-spacewalk22-client	Spacewalk Client 2.2 packages
oraclelinux7-spacewalk24-client	Spacewalk Client 2.4 packages
oraclelinux7-spacewalk24-server	Spacewalk Server 2.4 packages
oraclelinux7-uek-r3	Unbreakable Enterprise Kernel Release 3 (UEK R3) packages
oraclelinux7-uek-r4	Unbreakable Enterprise Kernel Release 4 (UEK R4) packages

2.3.2 Oracle Linux 6 Software Channels

The following table lists the Oracle Linux 6 (i386 and x86_64) software channels that you can set up using spacewalk-common-channels:

Software Channel	Description
oraclelinux6	Base channel for Oracle Linux 6

Software Channel	Description
`oraclelinux6-addons`	Add-on packages
`oraclelinux6-mysql56`	MySQL 5.6 packages
`oraclelinux6-mysql57`	MySQL 5.7 packages
`oraclelinux6-playground`	Mainline kernel playground packages (x86_64 only)
`oraclelinux6-scl12`	Software Collections 1.2 packages (x86_64 only)
`oraclelinux6-spacewalk22-client`	Spacewalk Client 2.2 packages
`oraclelinux6-spacewalk22-server`	Spacewalk Server 2.2 packages (x86_64 only)
`oraclelinux6-spacewalk24-client`	Spacewalk Client 2.4 packages
`oraclelinux6-spacewalk24-server`	Spacewalk Server 2.4 packages (x86_64 only)
`oraclelinux6-uek`	Unbreakable Enterprise Kernel Release 2 (UEK R2) packages
`oraclelinux6-uek-r3`	Unbreakable Enterprise Kernel Release 3 (UEK R3) packages
`oraclelinux6-uek-r4`	Unbreakable Enterprise Kernel Release 4 (UEK R4) packages

2.3.3 Oracle Linux 5 Software Channels

The following table lists the Oracle Linux 5 (i386 and x86_64) software channels that you can set up using `spacewalk-common-channels`:

Software Channel	Description
`oraclelinux5`	Base channel for Oracle Linux 5
`oraclelinux5-addons`	Add-on packages
`oraclelinux5-oracle-addons`	Add-on packages for Oracle products
`oraclelinux5-spacewalk22-client`	Spacewalk Client 2.2 packages
`oraclelinux5-spacewalk24-client`	Spacewalk Client 2.4 packages
`oraclelinux5-uek`	Unbreakable Enterprise Kernel Release 2 (UEK R2) packages
`oraclelinux5-unsupported`	Unsupported packages

2.4 Working with Repositories

Spacewalk repositories define where to obtain packages from ULN or the Oracle Linux yum server.

For ULN, a Spacewalk repository specifies the URL of a ULN channel, using the following format:

```
uln:///ULN_channel_label
```

You can get a list of available ULN channel labels by logging in to ULN (https://linux.oracle.com) and selecting the **Channels** tab.

The URL must contain three forward slash (`/`) characters, for example:

```
uln:///ol6_x86_64_latest
```

For the Oracle Linux yum server, a Spacewalk repository specifies the URL of an Oracle Yum Server repository, using the following format:

```
https://yum.oracle.com/repository_path
```

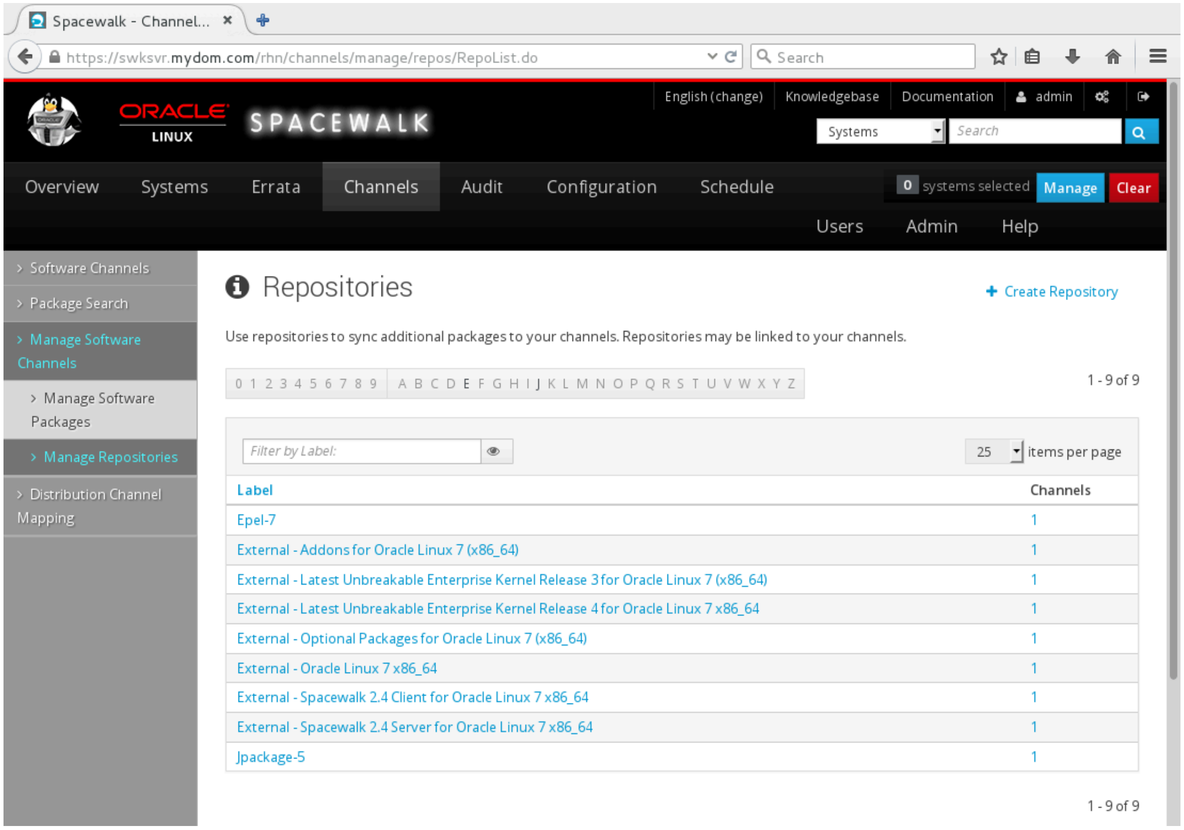
You can obtain the URLs from the yum repository files at https://yum.oracle.com/.

As each Spacewalk repository is specific to the i386 or x86_64 architecture, replace `$basearch` with the architecture, for example:

```
https://yum.oracle.com/repo/OracleLinux/OL6/6/base/x86_64/
```

2.4.1 Working with Repositories Using the Spacewalk Web Interface

Figure 2.1 Repositories Page



Repositories

Use repositories to sync additional packages to your channels. Repositories may be linked to your channels.

1 - 9 of 9

Label	Channels
Epel-7	1
External - Addons for Oracle Linux 7 (x86_64)	1
External - Latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux 7 (x86_64)	1
External - Latest Unbreakable Enterprise Kernel Release 4 for Oracle Linux 7 x86_64	1
External - Optional Packages for Oracle Linux 7 (x86_64)	1
External - Oracle Linux 7 x86_64	1
External - Spacewalk 2.4 Client for Oracle Linux 7 x86_64	1
External - Spacewalk 2.4 Server for Oracle Linux 7 x86_64	1
Jpackage-5	1

1 - 9 of 9

Go to **Channels**, select **Manage Software Channels**, and then select **Manage Repositories**:

- To create a repository:

  1. Click **+ create new repository**.

  2. On the Create New Repository page, enter the repository settings in the following fields:

     Repository Label Enter a name for the repository, for example: `Oracle Linux 6 (x86_64)`.

Repository URL

Enter the URL of the source for the repository's packages. For example: `uln:///ol6_x86_64_latest` or `https://yum.oracle.com/repo/OracleLinux/OL6/6/base/x86_64/`.

Leave the remaining fields unset for Oracle Linux.

3. Click **Create Repository** to create the repository.

- To view a repository, select its entry to display its details.

- To modify a repository:

  1. Select the repository that you want to edit.

  2. On the Repository Details page, modify the repository settings and click **Update Repository** to save your changes.

- To delete a repository:

  1. Go to **Channels**, select **Manage Software Channels**, and then select **Manage Repositories**.

  2. Select the repository that you want to delete.

  3. On the Repository Details page, click **delete repository** and then click **Delete Repository** to confirm.

To associate a software channel with a repository, see Section 2.5.1, “Working with Software Channels Using the Spacewalk Web Interface”.

2.4.2 Working with Repositories Using spacecmd

To create a repository, use the `repo_create` command, for example:

```
spacecmd {SSM:0}> repo_create
Name: Ksplice for Oracle Linux 7
URL: uln:///ol7_x86_64_ksplice
```

To list all repositories, use the `repo_list` command.

```
spacecmd {SSM:0}> repo_list
External - Oracle Linux 7 (x86_64)
External - Oracle Linux 7 Addons (x86_64)
External - Oracle Linux 7 MySQL 5.5 (x86_64)
External - Oracle Linux 7 MySQL 5.6 (x86_64)
External - Oracle Linux 7 Optional Packages (x86_64)
External - Oracle Linux 7 UEK Release 4 (x86_64)
External - Spacewalk 2.4 Client for Oracle Linux 7 (x86_64)
```

To list the details of a repository, use the `repo_details` command.

```
spacecmd {SSM:0}> repo_details "External - Oracle Linux 7 \(x86_64\)"
Repository Label:   External - Oracle Linux 7 (x86_64)
Repository URL:     https://yum.oracle.com/repo/OracleLinux/OL7/latest/x86_64/
Repository Type:    yum
```

The parentheses in the name must be quoted with backslashes to protect them from the shell.

To delete a repository, use the `repo_delete` command.

```
spacecmd {SSM:0}> repo_delete "Ksplice for Oracle Linux 7"
Repos
-----
Ksplice for Oracle Linux 7

Delete these repos [y/N]: y
```

To associate a software channel with a repository, see Section 2.5.2, “Working with Software Channels Using spacecmd”.

2.5 Working with Software Channels

The main software channel for an Oracle Linux release is termed a *base* (or *parent*) software channel. You can associate a number of child software channels with the base software channel. Each child software channel usually provides packages that are not available with the base software channel. If multiple versions of a package exist in different subscribed channels, `yum` versioning and dependency resolution ensure that the most up-to-date version of a package is installed.

You can subscribe a client to a single base channel and its child channels. For channels that are not specific to an update, such as `addons`, you can create an `addons` child channel for each update-level base channel and associate this child channel with the same `addons` repository.

If you set up Spacewalk to obtain Oracle Linux packages from ULN, Oracle recommends that you configure a separate `ol`*`N`*`_`*`arch`*`_`*`un`*`_base` base software channel and `ol`*`N`*`_`*`arch`*`_`*`un`*`_patch` child software channel for each update of Oracle Linux as it becomes available. This keeps the software channels small and helps to speed up channel cloning. Client systems are not upgraded across update levels unless you either change the source channel used for channel cloning or reconfigure the channels to which a client system subscribes.

The following example illustrates a typical configuration of the base and child software channels for Oracle Linux, where the base and patch channels are synchronized with ULN:

```
oraclelinux7-x86_64-base
 |-- oraclelinux7-x86_64-addons
 |-- oraclelinux7-x86_64-ksplice
 |-- oraclelinux7-x86_64-optional
 |-- oraclelinux7-x86_64-patch
 |-- oraclelinux7-x86_64-spacewalk24-client
 |-- oraclelinux7-x86_64-uek-r4
```

Note

Software channels other than the base and patch software channels do not have to be associated with ULN.

Some channels, such as those for Spacewalk Client and Spacewalk Server, are available on the Oracle Linux yum server, but not on ULN.

Other channels, such as those for DTrace user-space, Ksplice, and OFED packages, are available on ULN but not on the Oracle Linux yum server.

The Oracle Linux yum server provides a `public_ol`*`N`*`_latest` channel, which includes all packages for an entire Oracle Linux release. As individual patch channels for each update are not available, configure the base software channel to use the `public_ol`*`N`*`_latest` channel. You can use the `spacewalk-`

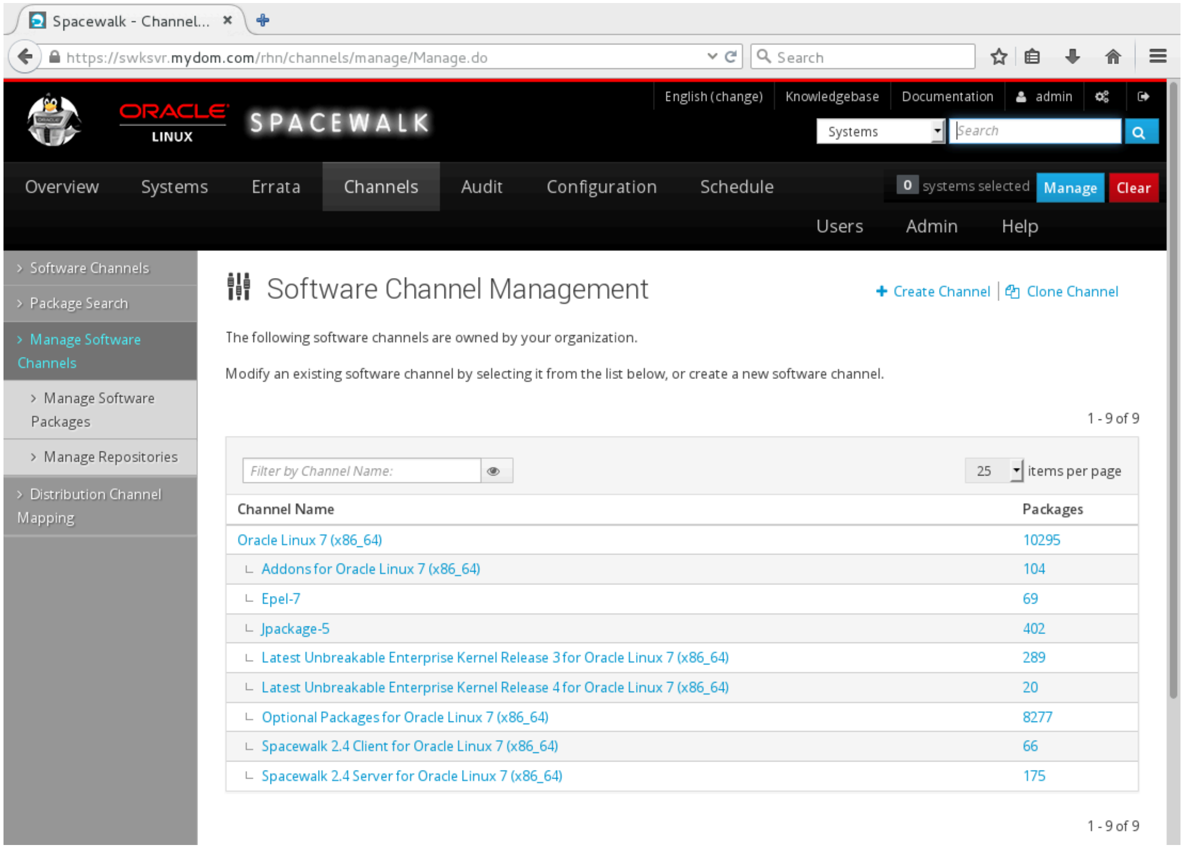
`common-channels` utility to configure the software channels, repositories, GPG keys, and activation keys for Oracle Linux 5, Oracle Linux 6, and Oracle Linux 7. See Section 2.3, “Configuring Software Channels to Obtain Packages from the Oracle Linux Yum Server”.

The following example illustrates a typical configuration of the base and child software channels for Oracle Linux, where the base channel is synchronized with the `public_ol7_latest` channel on the Oracle Linux yum server:

```
oraclelinux7-x86_64-latest
 |-- oraclelinux7-x86_64-addons
 |-- oraclelinux7-x86_64-optional
 |-- oraclelinux7-x86_64-spacewalk24-client
 |-- oraclelinux7-x86_64-uek-r4
```

2.5.1 Working with Software Channels Using the Spacewalk Web Interface

Figure 2.2 Software Channel Management Page



Software Channel Management

The following software channels are owned by your organization.

Modify an existing software channel by selecting it from the list below, or create a new software channel.

1 - 9 of 9

Channel Name	Packages
Oracle Linux 7 (x86_64)	10295
∟ Addons for Oracle Linux 7 (x86_64)	104
∟ Epel-7	69
∟ Jpackage-5	402
∟ Latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux 7 (x86_64)	289
∟ Latest Unbreakable Enterprise Kernel Release 4 for Oracle Linux 7 (x86_64)	20
∟ Optional Packages for Oracle Linux 7 (x86_64)	8277
∟ Spacewalk 2.4 Client for Oracle Linux 7 (x86_64)	66
∟ Spacewalk 2.4 Server for Oracle Linux 7 (x86_64)	175

1 - 9 of 9

Go to **Channels** and select **Manage Software Channels**:

- To create a software channel:

  1. Click **+ create new channel**.

  2. On the Create Software Channel page, enter channel settings in the following fields, whch are the most important for the initial configuration of a channel:

Channel Name

Enter a descriptive short name for the channel. For example: `Oracle Linux 6 (x86_64) Base`.

Channel Label

Enter a unique label for the channel that is used by the software. For example: `oraclelinux6-x86_64`.

Parent Channel

Select **None** if this is a base software channel or select the name of the parent channel if this is a child software channel.

Architecture

Select **IA32** (for i386 repositories) or **x86_64**, as appropriate.

Yum Repository Checksum Type

For Oracle Linux 5, select **sha1**.

For Oracle Linux 6 and Oracle Linux 7, select **sha256**.

Channel Summary

Enter a short, descriptive summary of the channel, for example the channel name. This field cannot be left blank.

Channel Description

Enter a long description of the channel or leave the field blank.

GPG key URL

Enter the URL of the local GPG key. For Oracle Linux, enter `file:///etc/pki/rpm-gpg/RPM-GPG-KEY`.

For third-party repositories, you must import the GPG key into Spacewalk and deploy the key by using provisioning or other method as appropriate to your site.

> **Note**
>
> Spacewalk client requires locally stored GPG keys. Do not use an HTTP based URL. Use a GPG key that you have imported into the local file system.

GPG key ID , **GPG key Fingerprint**

Enter the appropriate key ID and fingerprint for the Oracle Linux release from the following table:

Release	Key ID	Key Fingerprint
Oracle Linux 5	D303656F	99FD 2766 28EE DECB 5E5A F5F8 66CE D3DE 1E5E 0159
Oracle Linux 6	EC551F03	4214 4123 FECF C55B 9086 313D 72F9 7B74 EC55 1F03
Oracle Linux 7	EC551F03	4214 4123 FECF C55B 9086 313D 72F9 7B74 EC55 1F03

3. Click **Create Channel** to create the channel.

- To associate a software channel with a repository:

  1. Select the channel that you want to associate with a repository.

  2. On the Basic Channel Details page, select **Repositories**, select the check box of the repository, and click **Update Repositories**.

- To view a software channel, select its entry to display its details.

  Alternatively, go to **Channels**, select **Software Channels** and click **+** next to the name of the base channel to display its child channels. Select the entry for a software channel to display its details.

- To modify a software channel:

  1. Select the channel that you want to edit.
  2. On the Basic Channel Details page, modify the channel settings and click **Update Channel** to save your changes.

     Note

     You cannot change the channel label after you have created the channel.

- To delete a software channel:

  1. Select the channel that you want to delete.
  2. On the Basic Channel Details page, click **delete software channel** and then click **Delete Channel** to confirm.

2.5.2 Working with Software Channels Using spacecmd

To create a software channel, use the `softwarechannel_create` command, for example:

```
spacecmd {SSM:0}> softwarechannel_create
Channel Name: Ksplice for Oracle Linux 7
Channel Label: oraclelinux7-x86_64-ksplice
Base Channels
-------------
oraclelinux6-x86_64
oraclelinux7-x86_64

Select Parent [blank to create a base channel]: oraclelinux7-x86_64

Architecture
------------
i386-sun-solaris
ia32
ia64
ppc
sparc-sun-solaris
x86_64

Select: x86_64

Checksum type
------------
sha1
sha256
sha384
sha512

Select: sha1

GPG URL
------------
```

```
GPG URL: file:///etc/pki/rpm-gpg/RPM-GPG-KEY

GPG ID
------------

GPG ID: EC551F03

GPG Fingerprint
---------------

GPG Fingerprint: 4214 4123 FECF C55B 9086 313D 72F9 7B74 EC55 1F03
```

To associate a software channel with a repository, use the softwarechannel_addrepo command.

```
spacecmd {SSM:0}> softwarechannel_addrepo ksplice-ol7-x86_64 "Ksplice for Oracle Linux 7"
```

To list all software channels, use the softwarechannel_list command.

```
spacecmd {SSM:0}> softwarechannel_list oraclelinux7*
oraclelinux7-x86_64
oraclelinux7-x86_64-addons
oraclelinux7-x86_64-optional
oraclelinux7-x86_64-spacewalk24-client
oraclelinux7-x86_64-spacewalk24-server
oraclelinux7-x86_64-uek-r3
oraclelinux7-x86_64-uek-r4
```

The oraclelinux7* argument filters out all channels except those whose labels start with oraclelinux7.

To list all base (parent) software channels, use the softwarechannel_listbasechannels command.

```
spacecmd {SSM:0}> softwarechannel_listbasechannels
oraclelinux6-x86_64
oraclelinux7-x86_64
```

To list the children of a base software channel, use the softwarechannel_listchildchannels command.

```
spacecmd {SSM:0}> softwarechannel_listchildchannels oraclelinux7-x86_64
oraclelinux7-x86_64-addons
oraclelinux7-x86_64-optional
oraclelinux7-x86_64-spacewalk24-client
oraclelinux7-x86_64-spacewalk24-server
oraclelinux7-x86_64-uek-r3
oraclelinux7-x86_64-uek-r4
```

To list the systems that subscribe to a software channel, use the softwarechannel_listsystems command.

```
spacecmd {SSM:0}> softwarechannel_listsystems oraclelinux7-x86_64
svr1.mydom.com
svr2.mydom.com
...
```

To display the details of a software channel, use the softwarechannel_details command.

```
spacecmd {SSM:0}> softwarechannel_details oraclelinux7-x86_64
Label:              oraclelinux7-x86_64
Name:               Oracle Linux 7 (x86_64)
Architecture:       x86_64
```

```
Parent:
Systems Subscribed: 0
Number of Packages: 0

Summary
-------
Oracle Linux 7 (x86_64)

GPG Key:            EC551F03
GPG Fingerprint:    4214 4123 FECF C55B 9086  313D 72F9 7B74 EC55 1F03
GPG URL:            file:///etc/pki/rpm-gpg/RPM-GPG-KEY

Repos
-----
External - Oracle Linux 7 (x86_64)
```

To delete a software channel, use the `softwarechannel_delete` command.

```
spacecmd {SSM:0}> softwarechannel_delete oraclelinux7-x86_64
Channels
--------
oraclelinux7-x86_64

Delete these channels [y/N]: y
```

2.6 Synchronizing Software Channels

Once you have configured the software channels and associated repositories, you can synchronize the software either by performing an immediate manual synchronization or by scheduling a recurring synchronization job.

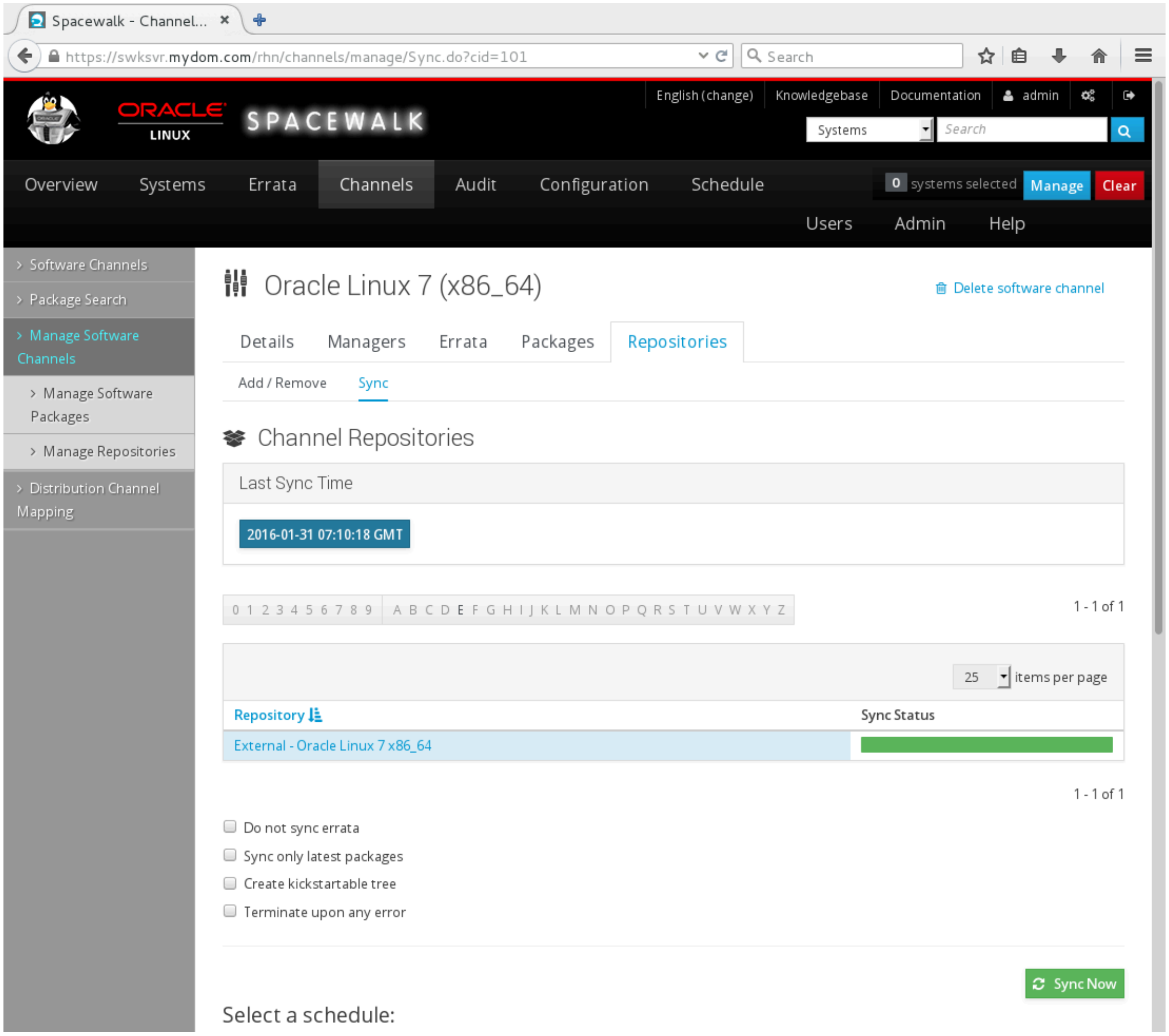
As a minimum, Oracle recommends that you update the Oracle Linux latest channels daily.

The initial synchronization of the Oracle Linux channels can take several days to complete. Oracle recommends that you perform an initial manual synchronization to populate the channels, and then configure a recurring job to keep them updated.

You can use the Spacewalk web interface, `spacecmd`, or `spacewalk-repo-sync` to synchronize software channels.

2.6.1 Synchronizing Software Channels Using the Spacewalk Web Interface

Figure 2.3 Channel Repositories Page



Oracle Linux 7 (x86_64)

Channel Repositories

Last Sync Time

2016-01-31 07:10:18 GMT

Repository	Sync Status
External - Oracle Linux 7 x86_64	🟩

☐ Do not sync errata
☐ Sync only latest packages
☐ Create kickstartable tree
☐ Terminate upon any error

Select a schedule:

To synchronize software channels:

1. Go to **Channels**, select **Manage Software Channels** and then select the required channel.
2. On the Channel Details page, select **Repositories** and then select **Sync**.
3. On the Channel Repositories page:

    a. Check the following check boxes as required:

    Do not sync erratas Select if you do not want to synchronize any errata that are available for the channel.

    Create kickstartable tree Select if you want to be able to associate a kickstart profile with the channel.

Note

ULN and the Oracle Linux yum server do not host the boot image files that you require to create a kickstartable tree. Instead, you can obtain the files from a Oracle Linux Media Pack DVD image and make them available on a local file system. See Chapter 4, *Provisioning Client Systems*.

Terminate upon any error Select if you want synchronization to stop if an error occurs.

b. Synchronize the software channel:

- To perform an immediate manual synchronization, click **Sync Now**.
- To schedule a recurring synchronization job, select the preferred schedule and times, and click **Schedule**.

  You can specify a schedule using Quartz format, for example `0 30 22 ? * *` would specify that Spacewalk should resynchronize the channel every day at 10:30 PM. Using Quartz format is the only way to schedule a synchronization several times a day. For example: `0 0 0,2,22 ? * *` would specify that synchronization should take place at 10 PM, midnight, and 2 AM.

Important

Scheduling a recurring synchronization job creates a Taskomatic job. If the job does not seem to be running, Taskomatic might have crashed due to insufficient memory. The default amount of memory allocated to Taskomatic memory is too small to generate the repository metadata. For this reason, Oracle recommends using `cron` jobs to run `spacewalk-repo-sync`. However, this only ensures that the package synchronization works. Creating the metadata is always performed by Taskomatic.

The solution is to increase the JVM memory settings in the configuration file for the Taskomatic daemon `/usr/share/rhn/config-defaults/rhn_taskomatic_daemon.conf`. The suggested minimum value for `wrapper.java.maxmemory` is 4096 to 8192 MB, depending on the size of the repositories that must be synchronized.

Similar memory issues can also occur in the web interface if you have big data sets, such as a large number of servers or packages. The solution is to increase the Tomcat memory limits in the `/etc/sysconfig/tomcat6` (Oracle Linux 6) or `/etc/sysconfig/tomcat` (Oracle Linux 7) file. Edit the `JAVA_OPTS` environment variable, and increase the `-Xms` (the start or initial amount of memory) and `-Xmx` (the maximum amount of memory) parameters.

2.6.2 Synchronizing Software Channels Using spacecmd

To synchronize a software channel, use the `softwarechannel_syncrepos` command, for example:

```
spacecmd {SSM:0}> softwarechannel_syncrepos oraclelinux7-x86_64-ksplice
```

The command returns immediately and does not show the status of the synchronization. You can use the `tail -f` command to view the log file `/var/logs/rhn/reposync/`*`channel_label`*`.log`.

To set up a schedule for channel synchronization, use the `softwarechannel_setsyncschedule` command, for example:

```
spacecmd {SSM:0}> softwarechannel_setsyncschedule oraclelinux7-x86_64-ksplice 0 30 2 ? * *
```

The example configures the `oraclelinux7-x86_64-ksplice` channel to be resynchronized once every day at 10:30am. Specify the schedule in Quartz format. See http://www.quartz-scheduler.org/overview/ for more information.

To list the scheduled channel synchronizations, use the `softwarechannel_listsyncschedule` command, for example:

```
spacecmd {SSM:0}> softwarechannel_listsyncschedule
  key  Channel Name                              Update Schedule
-----  --------------------                      ---------------
  114  oraclelinux7-x86_64                       0 0 1 ? * *
  115  oraclelinux7-x86_64-addons
  177  oraclelinux7-x86_64-ksplice               0 30 2 ? * *
  120  oraclelinux7-x86_64-optional
  127  oraclelinux7-x86_64-patch                 0 0 3 ? * *
  123  oraclelinux7-x86_64-spacewalk24-client    0 0 4 ? * *
  124  oraclelinux7-x86_64-spacewalk24-server    0 30 4 ? * *
  125  oraclelinux7-x86_64-uek-r3                0 0 1 ? * *
  126  oraclelinux7-x86_64-uek-r4                0 30 0 ? * *
```

To remove a scheduled channel synchronization, use the `softwarechannel_removesyncschedule` command, for example:

```
spacecmd {SSM:0}> softwarechannel_removesyncschedule oraclelinux7-x86_64-uek-r3
```

2.6.3 Synchronizing Software Channels Using spacewalk-repo-sync

You can use the `spacewalk-repo-sync` utility to synchronize software channels. Using this command requires that you are `root` or that you have been granted permission in `/etc/sudoers`. You can run `spacewalk-repo-sync` manually or in a `cron` job. If you run the command in a `cron` job, include the `-q` or `--quiet` option to prevent large email messages from being sent to `root`.

You can use the `spacewalk-repo-sync -l` command to display the channel label and the URL of the repository, for example:

```
# spacewalk-repo-sync -l | grep ksplice
ksplice-ol7-x86_64 | uln:///ol7_x86_64_ksplice
ksplice-ol6-i386 | uln:///ol6_i386_ksplice
ksplice-ol6-x86_64 | uln:///ol6_x86_64_ksplice

# spacewalk-repo-sync -l | grep addons
oraclelinux7-x86_64-addons | https://yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/
oraclelinux6-x86_64-addons | https://yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/
```

To synchronize a channel with either a yum or a ULN repository, use the `-c` option to specify the channel label, for example:

```
# spacewalk-repo-sync -c ksplice-ol6-x86_64
#### Channel label: ksplice-ol6-x86_64 ####
Repo URL: uln:///ol6_x86_64_ksplice
The download URL is: https://linux-update.oracle.com/XMLRPC/GET-REQ/ol6_x86_64_ksplice
Packages in repo:               1296
Packages already synced:           0
Packages to sync:              1296
1/1296 : ksplice-snmp-plugin-0.1.0-2.el6-0.x86_64
2/1296 : uptrack-updates-2.6.39-400.210.2.el6uek.x86_64-20150206-0-0.noarch
...
1295/1296 : uptrack-updates-2.6.32-220.el6.x86_64-20150130-0-0.noarch
1296/1296 : uptrack-updates-2.6.32-200.20.1.el6uek.x86_64-20141216-0-0.noarch
Linking packages to channel.
Repo uln:///ol6_x86_64_ksplice has 0 errata.
Sync completed.
Total time: 1 day, 8:56:47
```

In this example, all the packages were downloaded as the channel had not previously been synchronized with ULN. The total time taken was nearly 33 hours.

You can use the same form of the command to synchronize a channel with an Oracle Linux yum server repository, for example:

```
# spacewalk-repo-sync -c oraclelinux6-x86_64-addons
#### Channel label: oraclelinux6-x86_64-addons ####
Repo URL: https://yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/
Packages in repo:               308
No new packages to sync.
Repo https://yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/ has 6 errata.
Sync completed.
Total time: 0:01:09
```

In this example, there were no new packages available to download.

The `-p` option allows you to synchronize a parent channel and all of its children in one operation:

```
# spacewalk-repo-sync -p parent_channel
```

For example:

```
# spacewalk-repo-sync -p oraclelinux7-x86_64
```

If you additionally specify the `--latest` option, the server synchronizes only the latest packages that are available.

```
 spacewalk-repo-sync -p oraclelinux7-x86_64 --latest
#### Channel label: oraclelinux7-x86_64 ####
Repo URL: https://yum.oracle.com/repo/OracleLinux/OL7/optional/latest/x86_64/
Packages in repo:             10133
Packages already synced:          0
Packages to sync:              5845
1/5845 : bind-lite-devel-9.9.4-18.el7_1.3-32.i686
2/5845 : bind-sdb-chroot-9.9.4-18.el7_1.2-32.x86_64
...
```

In this example, only the 5,845 latest packages needed to be downloaded of the 10,133 packages in the repository.

Note

The `--latest` option downloads the latest packages that are available at the time of synchronization. It does not remove older packages from the channel. If the synchronization interval is large, you might miss a particular version of a package. This can have implications for errata handling, where errata are associated with specific package versions. If errata consistency is important to you, Oracle recommends that you do not use `--latest`. However, using `--latest` with a Ksplice channel is an exception because its packages are always cumulative.

For more information, see the `spacewalk-repo-sync(8)` manual page.

2.7 Cloning Software Channels

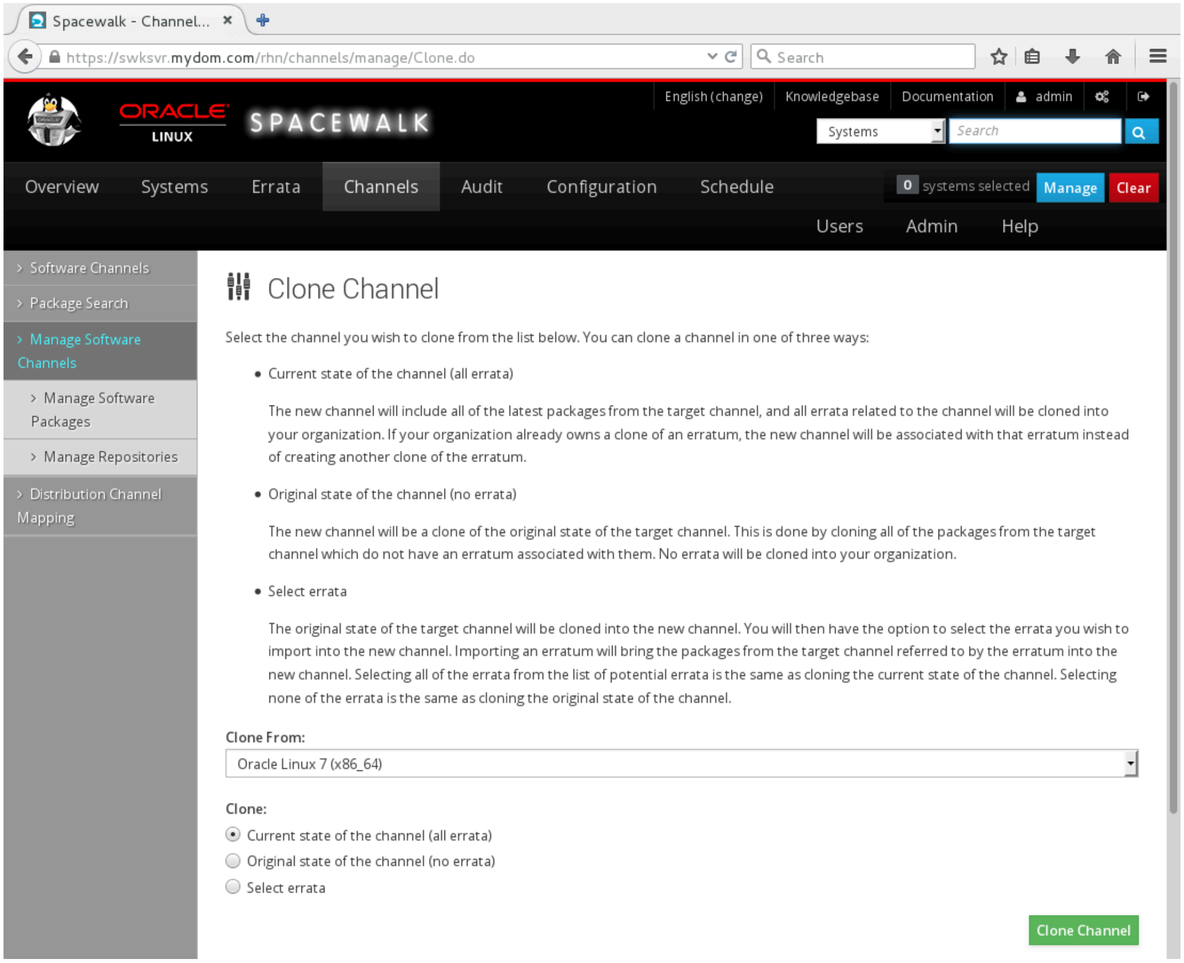
You can clone a software channel to capture the state of its packages and errata at a given point. Clone channels are useful for providing a stable reference base when developing and testing server systems before deployment. Clone channels are not recommended for deployed systems as they might be exposed to security vulnerabilities.

You can use the Spacewalk web interface to clone one channel at a time. If you want to clone a base channel and all of its child channels in one go, consider using the `spacecmd` or `spacewalk-clone-by-date` commands. If you want to clone a channel to preserve its state at a given date, use the `spacewalk-clone-by-date` command.

The `spacewalk-manage-channel-lifecycle` command allows you to manage the life cycles of software channels from development, through testing to production. Oracle recommends using `spacewalk-manage-channel-lifecycle` in preference to `spacewalk-clone-by-date` as it supports archiving, roll back, and is designed for repetitive use. See Section 2.8, “Managing Channel Life Cycles”.

2.7.1 Cloning Software Channels Using the Spacewalk Web Interface

Figure 2.4 Clone Channel Page



Clone Channel

Select the channel you wish to clone from the list below. You can clone a channel in one of three ways:

- Current state of the channel (all errata)

  The new channel will include all of the latest packages from the target channel, and all errata related to the channel will be cloned into your organization. If your organization already owns a clone of an erratum, the new channel will be associated with that erratum instead of creating another clone of the erratum.

- Original state of the channel (no errata)

  The new channel will be a clone of the original state of the target channel. This is done by cloning all of the packages from the target channel which do not have an erratum associated with them. No errata will be cloned into your organization.

- Select errata

  The original state of the target channel will be cloned into the new channel. You will then have the option to select the errata you wish to import into the new channel. Importing an erratum will bring the packages from the target channel referred to by the erratum into the new channel. Selecting all of the errata from the list of potential errata is the same as cloning the current state of the channel. Selecting none of the errata is the same as cloning the original state of the channel.

Clone From: Oracle Linux 7 (x86_64)

Clone:

● Current state of the channel (all errata)
○ Original state of the channel (no errata)
○ Select errata

Clone Channel

To clone a software channel:

1. Go to **Channels** and select **Manage Software Channels**.

2. Click **clone channel**.

3. On the Clone Channel page, select the source channel that you want to clone from the pull-down menu, and select the clone type:

   Current state of the channel (all errata)
   The clone channel includes all packages and errata from the source channel.

   Original state of the channel (no errata)
   The clone channel includes all of the packages that were originally in the source channel but no associated errata.

   Select errata
   The cloned channel includes all of the packages that were originally in the source channel and any errata that you select. Selecting all errata is equivalent to cloning the current state of the channel. Selecting no errata is equivalent to cloning the original state of the channel.

4. Click **Create Channel**.

5. On the Edit Software Channel page, you can change the channel details. The default label is the source channel label prefixed with `clone-`.

6. Click **Create Channel**

7. If you specified **Select errata** as the clone type, the Clone Errata page displays the available errata. For each erratum, you can choose to merge it with the source erratum, to create a separate cloned erratum, or to do nothing and exclude the erratum. By default, an erratum is merged with the source erratum, which means that the source erratum is used instead of creating a cloned copy.

   Click **Clone Errata** when you have finished cloning errata.

8. On the Details page for the channel, you can also edit the channel details other than the channel label.

   If you select the **Errata** tab, you can add errata from other channels or clone errata from the source channel.

   If you select the **Packages** tab, you can add or remove packages from the channel.

2.7.2 Cloning Software Channels Using spacecmd

To clone a single channel, use the `softwarechannel_clone` command.

```
spacecmd {SSM:0}> softwarechannel_clone -s ol6u6-x86_64 -x "s/$/-clone/" -o
spacecmd {SSM:0}> softwarechannel_details ol6u6-x86_64-clone
Label:              ol6u6-x86_64-clone
Name:               Oracle Linux 6 Update 6 Base Channel (x86_64)-clone
Architecture:       x86_64
Parent:
Systems Subscribed: 0
Number of Packages: 5522

Summary
-------
Oracle Linux 6 Update 6 Base Channel (x86_64)-clone
```

```
GPG Key:            EC551F03
GPG Fingerprint:    4214 4123 FECF C55B 9086  313D 72F9 7B74 EC55 1F03
GPG URL:            file:///etc/pki/rpm-gpg/RPM-GPG-KEY
```

The `-x` option appends `-clone` to the new channel's name and label. The `-o` option excludes all errata from the cloned channel.

To diff the package contents of two channels, use the `softwarechannel_diff` command.

```
spacecmd {SSM:0}> softwarechannel_diff ol6u6-x86_64-clone ol6u6-x86_64
--- ol6u6-x86_64-clone

+++ ol6u6-x86_64

@@ -22,7 +22,18 @@

 GConf2-devel-2.28.0-6.el6.i686
 GConf2-devel-2.28.0-6.el6.x86_64
 GConf2-gtk-2.28.0-6.el6.x86_64
+ImageMagick-6.5.4.7-7.el6_5.i686
+ImageMagick-6.5.4.7-7.el6_5.x86_64
+ImageMagick-c++-6.5.4.7-7.el6_5.i686
...
 zlib-devel-1.2.3-29.el6.i686
 zlib-devel-1.2.3-29.el6.x86_64
 zlib-static-1.2.3-29.el6.x86_64
+zsh-4.3.10-7.el6.x86_64
+zsh-html-4.3.10-8.el6_5.x86_64
```

To clone a base channel and all of its child channels, use the `softwarechannel_clonetree` command.

```
spacecmd {SSM:0}> softwarechannel_clonetree -s ol6u6-x86_64 -p "clone-"
INFO: Cloning ol6u6-x86_64 as clone-ol6u6-x86_64
INFO: Cloning ol6-x86_64-addons as clone-ol6-x86_64-addons
INFO: Cloning ol6u6-x86_64-oracle as clone-ol6u6-x86_64-oracle
INFO: Cloning ol6-x86_64-spacewalk22-client as clone-ol6-x86_64-spacewalk22-client
INFO: Cloning ol6-x86_64-spacewalk22-server as clone-ol6-x86_64-spacewalk22-server
INFO: Cloning ol6u6-x86_64-patches as clone-ol6u6-x86_64-patches
INFO: Cloning ol6-x86_64-uekr3_latest as clone-ol6-x86_64-uekr3_latest
```

2.7.3 Cloning Software Channels by Date Using spacewalk-clone-by-date

You can use the `spacewalk-clone-by-date` utility to clone Oracle Linux channels for a given date, which preserves the state of the channel's errata and their associated packages from its original release up to and including that date. If required, you can blacklist or remove packages, and choose which types of errata to include or exclude.

The following example clones only security errata from the `ol6-x86_64-latest` channel up to July 4, 2015 to `ol6-x86_64-latest-sec-20150704`:

```
# spacewalk-clone-by-date --username=swadmin --password=swpasswd \
  --to_date=2015-07-04 --channels=ol6-x86_64-latest ol6-x86_64-latest-sec-20150704 \
  --security_only --background --assumeyes
```

The command runs uninterrupted in the background. The specified spacewalk user must have Organizational Administrator or Channel Administrator privileges.

The next example clones both a base channel and a patch child channel up to August 15 2015, excluding all versions of the `ntp` package and packages that start with `fuse`.

```
# spacewalk-clone-by-date --username=swadmin --password=swpasswd \
  --channels=ol6-x86_64-base ol6-x86_64-base-20150815
  --channels=ol6-x86_64-patch ol6-x86_64-patch-20150815
  --to_date=2015-08-15 --blacklist=ntp,fuse*
```

You can run `spacewalk-clone-by-date` remotely by using the `-s` option to specify the Spacewalk server's URL for XML/RPC API connections, for example `-s https://swksvr_FQDN/rpc/api`.

A common use case is to run `spacewalk-clone-by-date` at regular intervals to keep cloned channels up to date. To generate a sample configuration file, use the following command:

```
# spacewalk-clone-by-date --sample-config
```

For more information, see the `spacewalk-clone-by-date(8)` manual page.

2.8 Managing Channel Life Cycles

The `spacewalk-manage-channel-lifecycle` command allows you to manage the life cycle of a software channel from development, through testing to production, as shown in the following examples:

- Create a development channel `dev-ol6-x86_64-appsvr` based on the latest available packages in `ol6-x86_64-appsvr`.

  ```
  # spacewalk-manage-channel-lifecycle -c ol6-x86_64-appsvr --init
  ```

- Promote the packages from the development channel to the test channel `test-ol6-x86_64-appsvr`.

  ```
  # spacewalk-manage-channel-lifecycle -c dev-ol6-x86_64-appsvr --promote
  ```

- Promote the packages from the test channel to the production channel `prod-ol6-x86_64-appsvr`.

  ```
  # spacewalk-manage-channel-lifecycle -c test-ol6-x86_64-appsvr --promote
  ```

You can save the state of a channel by creating an archive channel `archive-date-channel`.

```
# spacewalk-manage-channel-lifecycle -c prod-ol6-x86_64-appsvr --archive
```

If you need to restore the state of a channel, use the `--rollback` option and specify the archived version of the channel that you want to restore, for example:

```
# spacewalk-manage-channel-lifecycle -c archive-20110520-test-ol6-x86_64-appsvr --rollback
```

Use the `-l` option to list the channels:

```
# spacewalk-manage-channel-lifecycle -l
Channel tree:

 1. archive-20160203-ol6-x86_64-appsvr
      \__ archive-20160203-prod-ol6-x86_64-appcmd
      \__ archive-20160203-prod-ol6-x86_64-applib

 2. dev-ol6-x86_64-appsvr
      \__ dev-ol6-x86_64-appcmd
      \__ dev-ol6-x86_64-applib

 3. ol6-x86_64-appsvr
      \__ ol6-x86_64-appcmd
      \__ ol6-x86_64-applib

 4. prod-ol6-x86_64-appsvr
```

```
     \__ prod-ol6-x86_64-appcmd
     \__ prod-ol6-x86_64-applib

5. test-ol6-x86_64-appsvr
     \__ test-ol6-x86_64-appcmd
     \__ test-ol6-x86_64-applib
```

Chapter 3 Creating Activation Keys

Note

If you use `spacewalk-common-channels` with the `-k` option to set up Oracle Linux software channels and repositories, the command also creates an activation key and associates this key with the software channels.

An activation key allows a client system to register with Spacewalk without needing to provide a user name and password. After you have configured and synchronized a base software channel and any child channels, create an activation key so that client systems can register with Spacewalk.

If required, you can also use an activation key to define the default parent and child software channel subscriptions and any configuration channels. Spacewalk subscribes a client to these channels during registration. However, you can change the channels at any later time without changing the activation key.

Note

Take care not to oversubscribe client systems to channels. Oracle recommends that you configure activation keys to subscribe a client to a minimal number of channels.

If required, you can create an activation key for each combination of base channel, system architecture, and server type. For example, you could create separate activation keys for web, mail, or application servers running on Oracle Linux 6 (i386), Oracle Linux 6 (x86_64), and Oracle Linux 7 (x86_64). Alternatively, you could create a single, default activation key without any channel assignments and use it for all server types.

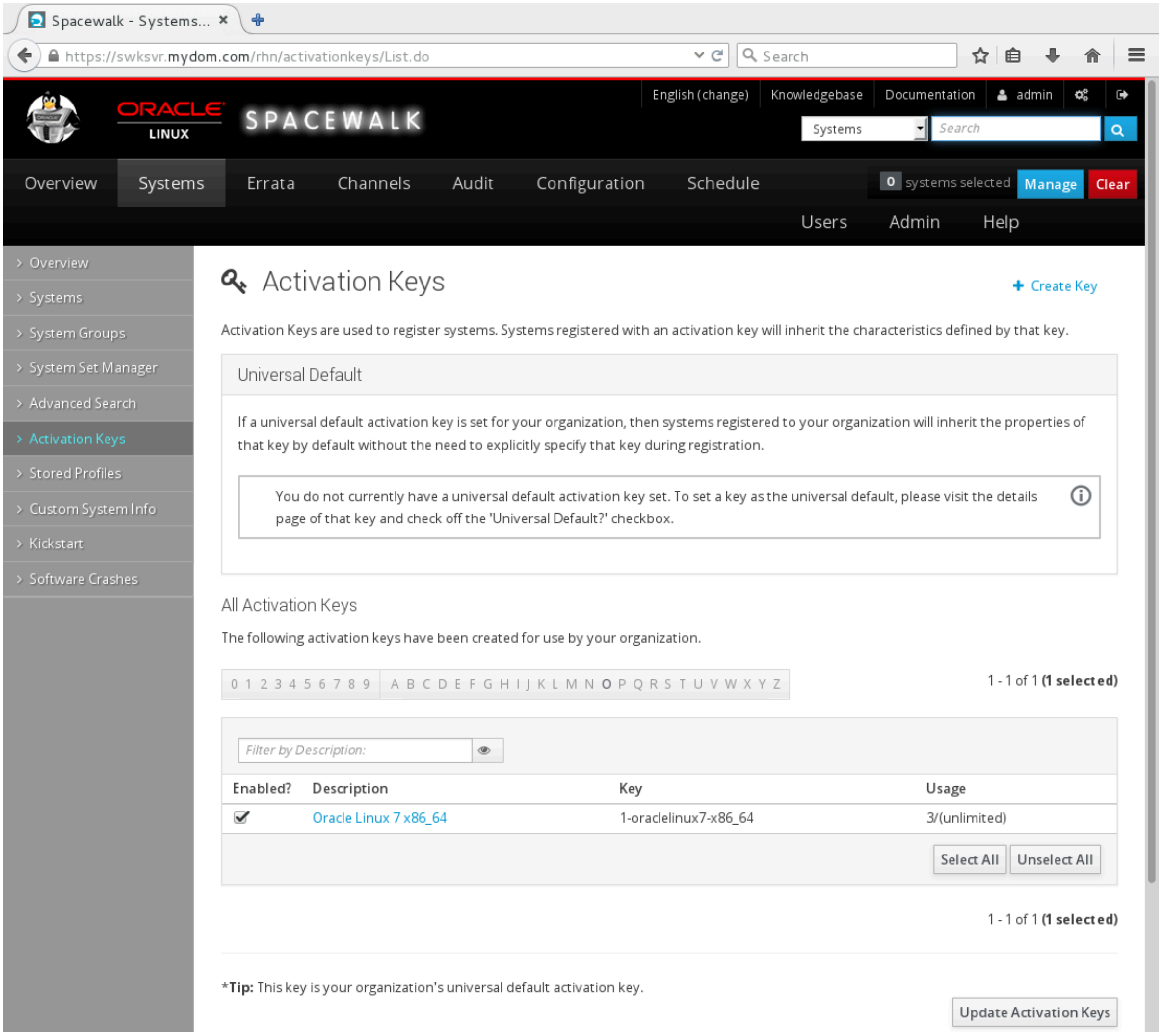
Oracle recommends that you enter a meaningful label for the activation key in the **Key** field and that you do not use automatic key generation.

Create a key with a label that is easy to understand, for example based on the version number and architecture (`oraclelinux6-x86_64`), or based on the server type (`webserver` or `appserver`).

Spacewalk automatically prefixes the organization ID to the activation key label. For example, if you select `oraclelinux-x86_64` as the label, Spacewalk creates a key named `1-oraclelinux-x86_64`, where the prefix identifies the organization. You can create multiple activation keys for the same base channel, each with different configuration options. The name that you use is presented during Spacewalk client registration. Creating your own key labels helps you to select the correct key.

3.1 Working with Activation Keys Using the Spacewalk Web Interface

Figure 3.1 Activation Keys Page



Activation Keys

Activation Keys are used to register systems. Systems registered with an activation key will inherit the characteristics defined by that key.

Universal Default

If a universal default activation key is set for your organization, then systems registered to your organization will inherit the properties of that key by default without the need to explicitly specify that key during registration.

You do not currently have a universal default activation key set. To set a key as the universal default, please visit the details page of that key and check off the 'Universal Default?' checkbox.

All Activation Keys

The following activation keys have been created for use by your organization.

1 - 1 of 1 (**1 selected**)

Enabled?	Description	Key	Usage
☑	Oracle Linux 7 x86_64	1-oraclelinux7-x86_64	3/(unlimited)

1 - 1 of 1 (**1 selected**)

***Tip:** This key is your organization's universal default activation key.

Go to **Systems** and select **Activation Keys**:

- To create an activation key:

  1. Click **+ create new key**.

  2. On the Create Activation Key page, enter the key settings in the following fields:

     Description
     Enter a description for the key. For example: `Oracle Linux 6 (x86_64)`.

     Key
     Enter a meaningful label for the activation key. For example: `oraclelinux6-x86_64`.

Usage

Leave blank to allow unlimited use by clients.

Base Channels

Select the base channel with which the key is associated. For example: `Oracle Linux 6 (x86_64) Base`.

Add-on Entitlements

Select additional entitlements that the key grants, such as **Provisioning**, **Virtualization**, or **Virtualization Platform**.

> **Note**
>
> Entitlements are deprecated and will be replaced in a future version of Spacewalk. However, you must still configure entitlements for activation keys in Spacewalk 2.4
>
> To allow Spacewalk to update packages, apply errata, or deploy configuration files on a client system that registers using this activation key, enable the **Provisioning** entitlement.
>
> The Virtualization and Virtualization Platform entitlements are mutually exclusive. Virtualization allows up to four KVM guests, whereas Virtualization Platform allows unlimited KVM guests.
>
> If you want to enable the configuration file deployment feature, this option is available if you modify the activation key after creating it.

Universal Default

Select if the key should be used as the default activation key for all newly-registered systems.

> **Note**
>
> Oracle strongly recommends that you do not associate any channels with a universal default key. Spacewalk uses the universal default key if a key is not specified so it might be used by any version of any operating system.

3. Click **Create Activation Key** to create the activation key.

- To view an activation key, select its entry to display its details.

- To modify an activation key:

  1. Select the activation key whose settings you want to edit.

  2. On the Activation Key Details page, modify the key settings.

     Note

     You cannot select **Configuration File Deployment** unless the **Provisioning** add-on entitlement is enabled. If you want to enable this feature and **Provisioning** is not enabled, select **Provisioning** and click **Update Activation Key** before selecting **Configuration File Deployment**.

  3. Click **Update Activation Key** to save your changes.

- To delete an activation key:

  1. Select the activation key that you want to delete.

  2. On the Activation Key Details page, click **delete key** and then click **Delete Activation Key** to confirm.

3.2 Working with Activation Keys Using spacecmd

To create an activation key, use the `activationkey_create` command, for example:

```
spacecmd {SSM:0}> activationkey_create
Name (blank to autogenerate): oraclelinux6-x86_64
Description [None]: Oracle Linux 6 (x86_64)

Base Channels
-------------
oraclelinux6-x86_64
oraclelinux7-x86_64

Base Channel (blank for default): oraclelinux6-x86_64

provisioning_entitled Entitlement [y/N]: y

monitoring_entitled Entitlement [y/N]: N

virtualization_host Entitlement [y/N]: N

virtualization_host_platform Entitlement [y/N]: N

Universal Default [y/N]: N
INFO: Created activation key 1-oraclelinux6-x86_64
```

To list all activation keys, use the `activationkey_list` command.

```
spacecmd {SSM:0}> activationkey_list
1-oraclelinux6-x86_64
1-oraclelinux7-x86_64
```

To display the details of an activation key, use the `activationkey_details` command.

```
spacecmd {SSM:0}> activationkey_details 1-oraclelinux7-x86_64
Key:                    1-oraclelinux7-x86_64
Description:            Oracle Linux 7 x86_64
Universal Default:      False
```

```
Usage Limit:            0
Deploy Config Channels: False

Software Channels
-----------------
oraclelinux7-x86_64
 |-- oraclelinux7-x86_64-addons
 |-- oraclelinux7-x86_64-mysql55
 |-- oraclelinux7-x86_64-mysql56
 |-- oraclelinux7-x86_64-optional
 |-- oraclelinux7-x86_64-spacewalk24-client
 |-- oraclelinux7-x86_64-uek-r4

Configuration Channels
----------------------

Entitlements
------------

System Groups
-------------

Packages
--------
```

To delete an activation key, use the `activationkey_delete` command.

```
spacecmd {SSM:0}> activationkey_delete 1-oraclelinux7-x86_64
1-oraclelinux7-x86_64

Delete activation key(s) [y/N]: y
```

Chapter 4 Provisioning Client Systems

Oracle supports the provisioning of Oracle Linux servers as Spacewalk client systems. You can use Spacewalk to manage Fedora-based clients and other systems by using upstream client binaries and repositories but Oracle does not provide support for these clients.

Oracle provides Spacewalk client packages for Oracle Linux 5 and Oracle Linux 6 for both i386 and x86_64 architectures. For Oracle Linux 7, packages for the x86_64 architecture only are provided.

If you configure a Spacewalk server to mirror the Spacewalk Client 2.4 channel provided on the Oracle Linux yum server and enable this channel for a kickstart profile, Spacewalk automatically installs the Spacewalk Client software on any Oracle Linux server that it provisions and it registers this server as a Spacewalk client. You can use the `spacewalk-common-channels` command to configure the Spacewalk Client 2.4 channel as described in Section 2.3, “Configuring Software Channels to Obtain Packages from the Oracle Linux Yum Server”.

4.1 About Kickstart Trees, Distributions, and Profiles

You can use kickstart to automate the installation of Oracle Linux systems and use Spacewalk to provide the packages during the installation.

If you want to provision bare-metal and virtual machine systems, create a distribution in Spacewalk for each combination of Oracle Linux release and system architecture that you want to be able to install by using kickstart.

You need to set up a local directory such as `/var/distro-trees` on your Spacewalk server that contains the entire kickstart tree for each distribution that includes the installation kernel, the initial ram-disk image, installation files, and information about the repositories. This directory must be readable and accessible by the `httpd` and `tomcat6` services. The kickstart tree does not need to include any packages, as Spacewalk provides these.

Relative to the root of the kickstart tree, the installation kernel and initial ram-disk images should be located at `./images/pxeboot`. For example, if the root of the kickstart tree for Oracle Linux 6 (x86_64) server installations is `/var/distro-trees/ol6-x86_64-server`, the installation kernel and initial ram-disk images would be located at `/var/distro-trees/ol6-x86_64-server/images/pxeboot`.

See Section 4.2, “Setting up Kickstart Trees”.

You create a kickstart distribution by associating a kickstart tree with existing channels. A client boots using the kickstart tree but installs its software packages from the existing channels. The packages installed on the client will be as up to date as those that are currently available from the channels.

See Section 4.3, “Working with Kickstart Distributions”.

Note

It is not currently possible to use the `spacewalk-repo-sync --sync-kickstart` command to create a kickstart distribution from the channels that are available on the Oracle Linux yum server or ULN.

Once you have created a kickstart distribution, you can use it with kickstart profiles. Typically, each profile provisions a different type of server. You can configure a profile to generate a kickstart file or you can use an existing kickstart file. You can associate as many profiles with a single distribution as you need to provision servers that share the same combination of Oracle Linux release and system architecture.

See Section 4.4, “Working with Kickstart Profiles”.

4.2 Setting up Kickstart Trees

To set up the kickstart tree for a distribution on the Spacewalk server:

1. If the root for all kickstart trees (typically, /var/distro-trees) does not already exist, create this directory and, if required, set its SELinux file type as httpd_sys_content_t so that httpd and tomcat6 can make the files available:

   a. Create the root directory for the kickstart tree, for example:

   ```
   # mkdir -p /var/distro-trees/ol7u2-x86_64-server
   ```

   b. If SELinux is enabled in enforcing mode on your system:

      i. Use the semanage command to define the default file type of the kickstart tree as httpd_sys_content_t:

      ```
      # /usr/sbin/semanage fcontext -a -t httpd_sys_content_t "/var/distro-trees(/.*)?"
      ```

      ii. Use the restorecon command to apply the file type to the entire directory hierarchy.

      ```
      # /sbin/restorecon -R -v /var/distro-trees
      ```

      Note

      The semanage and restorecon commands are provided by the policycoreutils-python and policycoreutils packages.

2. Download the full Oracle Linux Media Pack DVD image for the Oracle Linux release and system architecture from the Oracle Software Delivery Cloud at https://edelivery.oracle.com/linux and mount it on a suitable mount point, for example:

   ```
   # mount -o loop /var/ISOs/DVDimage.iso /var/distro-trees/olNun-arch-server
   ```

   The following table lists some of the full Oracle Linux Media Pack DVD image files that are available for Oracle Linux releases:

Release	Architecture	DVD Image File
Oracle Linux 5 Update 11	x86 (32-bit)	V47134-01.iso
Oracle Linux 5 Update 11	x86_64 (64-bit)	V47133-01.iso
Oracle Linux 6 Update 7	x86 (32-bit)	V77200-01.iso
Oracle Linux 6 Update 7	x86_64 (64-bit)	V77197-01.iso
Oracle Linux 7 Update 2	x86_64 (64-bit)	V100082-01.iso

3. Create an entry in /etc/fstab so that the system always mounts the DVD image after a reboot, for example:

   ```
   /var/ISOs/V100082-01.iso  /var/OSimage/OL7u2-x86_64-server  iso9660  loop,ro  0 0
   ```

4. If you want to associate a kickstart tree with a software channel or to be able to boot iPXE clients, create a symbolic link from /var/www/html to /var/distro-trees.

   ```
   # ln -s /var/distro-trees /var/www/html/distro-trees
   ```

The installation images will then be available at a URL such as `https://swksvr_FQDN/distro-trees/olNun-arch-server/images`, where *`swksvr_FQDN`* is the FQDN of the Spacewalk server or proxy.

Using a browser, you should be able to see the contents of the mounted installation image listed at the URL. If you cannot see the files:

a. Edit `/etc/httpd/conf/httpd.conf` and enable support for directory indexing and symbolic links by specifying `Options Indexes FollowSymLinks` in the `<Directory "/var/www/html">` section.

b. Reload the `httpd` service.

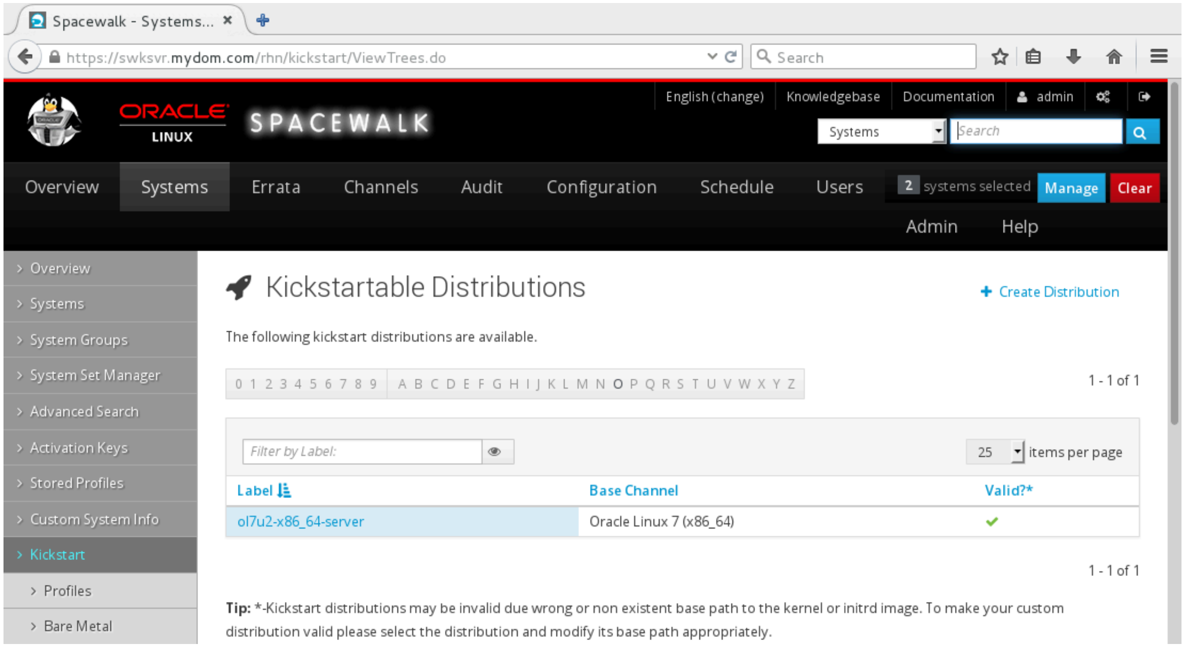
```
# service httpd reload
```

4.3 Working with Kickstart Distributions

If you want to create a kickstart distribution that uses a kickstart tree with existing software channels, you can use either the Spacewalk web interface or the `spacecmd` command.

4.3.1 Working with Kickstart Distributions Using the Spacewalk Web Interface

Figure 4.1 Kickstartable Distributions Page



Kickstartable Distributions

The following kickstart distributions are available.

Label	Base Channel	Valid?*
ol7u2-x86_64-server	Oracle Linux 7 (x86_64)	✓

1 - 1 of 1

Tip: *-Kickstart distributions may be invalid due wrong or non existent base path to the kernel or initrd image. To make your custom distribution valid please select the distribution and modify its base path appropriately.

Go to **Systems**, select **Kickstart** and then **Distributions**:

- To create a distribution:

  1. Click **+ create new distribution**.

  2. On the Create Activation Key page, enter the key settings in the following fields:

Distribution Label Enter a label for the distribution. For example: `ol7u2-x86_64-server`.

Tree Path Enter the path of the kickstart tree for the distribution. For example: `/var/distro-trees/ol7u2-x86_64-server`.

Base Channel Select the base channel with which the distribution is associated. For example: `Oracle Linux 7 (x86_64) Base`.

Installer Generation Select the operating system release that provided the installer. For example: `Red Hat Enterprise Linux 7/Oracle Linux 7`.

Kernel Options Enter any options that should be specified when booting the installation kernel, for example, `noapic` or `text`.

Post Kernel Options Enter any options that should be specified when booting the installed system's kernel, for example, `3` or `selinux=0`.

3. Click **Create Kickstart Distribution** to create the distribution.

- To view a distribution, select its entry to display its details.

- To modify a distribution:

  1. Select the distribution whose settings you want to edit.

  2. On the Edit Kickstart Distribution page, modify the settings as required.

  3. If you want to create, modify, or delete kickstart variables:

     a. Select the **Variables** tab.

     b. On the Kickstart Variables page, define new variables or edit or delete existing variable entries.

     c. Click **Update Variables** to save your changes.

     d. Select the Edit tab to return to the Edit Kickstart Distribution page.

  4. Click **Update Kickstart Distribution** to save your changes.

- To delete a distribution:

  1. Select the distribution that you want to delete.

  2. On the Edit Kickstart Distribution page, click **delete distribution** and then click **Delete Distribution** to confirm.

4.3.2 Working with Kickstart Distributions Using spacecmd

To create a distribution, use the `distribution_create` command, for example:

```
spacecmd {SSM:0}> distribution_create
Name: ol7-x86_64-server
Path to Kickstart Tree: /var/distro-trees/ol7-x86_64-server
```

```
Base Channels
-------------
oraclelinux6-x86_64
oraclelinux7-x86_64

Base Channel: oraclelinux7-x86_64

Install Types
-------------
fedora
generic_rpm
rhel_2.1
rhel_3
rhel_4
rhel_5
rhel_6
rhel_7
suse

Install Type: rhel_7
```

To list all activation keys, use the `distribution_list` command.

```
spacecmd {SSM:0}> distribution_list
ol6-x86_64-server
ol7-x86_64-server
```

To display the details of an activation key, use the `distribution_details` command.

```
spacecmd {SSM:0}> distribution_details ol7-x86_64-server
Name:    ol7-x86_64-server
Path:    /var/distro-trees/ol7-x86_64-server
Channel: oraclelinux7-x86_64
```

To delete an activation key, use the `distribution_delete` command.

```
spacecmd {SSM:0}> distribution_delete ol7-x86_64-server
ol7-x86_64-server

Delete distribution tree(s) [y/N]: y
```

4.4 Working with Kickstart Profiles

A kickstart configuration file contains all the information that kickstart requires to perform an automated installation of a server. Every Oracle Linux installation creates a kickstart file, `/root/anaconda-ks.cfg`. You can use this file to repeat an installation, or you can customize the settings in this file for different system configurations. The file is also useful for troubleshooting a boot-time problem with an installed system. You can use Spacewalk to create a kickstart profile that generates a kickstart file or you can create a profile that contains a kickstart file that you have uploaded or copied into Spacewalk.

You can use either the Spacewalk web interface or `spacecmd` to configure kickstart profiles.

4.4.1 Adding GPG Keys and SSL Certificates Using the Spacewalk Web Interface

If a target system for a kickstart installation requires either correct GPG keys to install signed packages or a correct SSL certificate to access a Spacewalk server, you must add these keys and certificates to Spacewalk before associating them with your kickstart profile definitions.

To add a GPG key or SSL certificate to Spacewalk:

1. Go to **Systems**, select **Kickstart** and then **GPG and SSL Keys** to display the GPG Public Keys and SSL Certificates page.
2. Click **Create Stored Key/Cert** to display the Create GPG/SSL Key page.
3. Enter a text description of the key or certificate in the Description field.
4. Select **GPG** or **SSL**, as appropriate, from the **Type** pull-down menu.
5. Either click **Browse** and select the key or certificate file to upload or paste the file contents into the Key contents field.

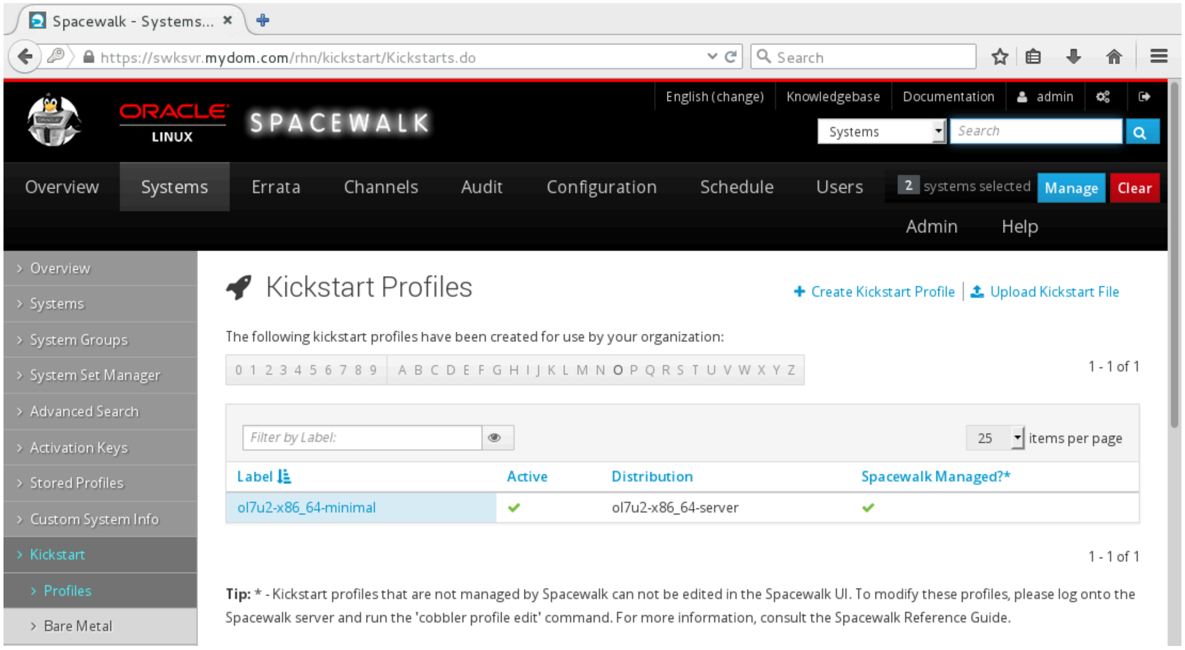
> **Note**
>
> GPG keys must be in ASCII, not binary, format.

6. Click **Create Key**.

After you have added the GPG keys and SSL certificates to Spacewalk, you can associate them with kickstart profiles as described in Section 4.4.2, "Working with Kickstart Profiles Using the Spacewalk Web Interface".

4.4.2 Working with Kickstart Profiles Using the Spacewalk Web Interface

Figure 4.2 Kickstart Profiles Page



Kickstart Profiles

The following kickstart profiles have been created for use by your organization:

1 - 1 of 1

Label	Active	Distribution	Spacewalk Managed?*
ol7u2-x86_64-minimal	✓	ol7u2-x86_64-server	✓

1 - 1 of 1

Tip: * - Kickstart profiles that are not managed by Spacewalk can not be edited in the Spacewalk UI. To modify these profiles, please log onto the Spacewalk server and run the 'cobbler profile edit' command. For more information, consult the Spacewalk Reference Guide.

Go to **Systems**, select **Kickstart** and then **Profiles**:

- To create a profile that contains a kickstart file generated by Spacewalk:

  1. Click **+ create new kickstart profile**.
  2. On Step 1: Create Kickstart Profile page, enter the profile settings in the following fields:

Label
Enter a label for the profile. For example: `ol7u2-x86_64-minimal`.

Base Channel
Select the base channel with which the distribution is associated. For example: `Oracle Linux 7 (x86_64) Base`.

Kickstartable Tree
Select the kickstart distribution with which the profile is associated. For example: `ol7u2-x86_64-server`.

Virtualization Type
Select the virtualization type.

For Oracle Linux installations on virtual machines that are hosted by Oracle VM or Oracle VM VirtualBox, select **None**.

For Oracle Linux 6 and Oracle Linux 7 as a KVM guest, select **KVM Virtualized Guest**.

Click **Next**.

3. On Step 2: Distribution File Location page, click **Next** to accept the default download location that Spacewalk creates from the kickstart tree.

4. On Step3: Root Password page, enter and verify the root password for newly installed systems, and click **Finish** to create the profile.

   You can now configure the kickstart profile itself. The following steps describe the changes that are usually required to create a usuable profile.

   > **Note**
   >
   > At any stage, you can select **Kickstart File** to view the kickstart file that Spacewalk would generate from the profile using the saved configuration settings.

5. Select **Kickstart Details** to display the Details page:

   a. On the Details page, you can:

      - Edit the kickstart label.
      - Change the virtualization type.
      - Activate or de-activate the profile.
      - Configure custom post and pre script logging.
      - Choose whether to save a copy of the kickstart configuration to `/root` on an installed system.
      - Select an organization default profile.
      - Specify installation and post-installation kernel options.
      - Add a description of the profile.

      Click **Update Kickstart** to save your changes.

b. Select **Operating System** and select the check boxes for the child channels that you want to associate with the profile.

> **Note**
>
> To allow Spacewalk to register the system automatically, select the Spacewalk Client channel.
>
> The **Software URL** path is the virtual location where Spacewalk hosts the installation packages. It is not a real path in the file system.

Click **Update Kickstart** to save your changes.

c. (Optional) Select **Variables**, define any kickstart variables that you require, and click **Update Variables** to save your changes.

d. Select **Advanced Options**, modify the kickstart options, and click **Update Kickstart** to save your changes.

For more information about the available kickstart options, see Appendix A, *Kickstart Options*.

e. If you intend to install bare-metal systems, select **Bare Metal Kickstart** and follow the instructions on the Bare Metal Kickstart page, which lists the URL of the kickstart file that you can use to install bare-metal systems and allows you to define the IP address ranges that are associated with the profile.

6. Select **System Details** to display the Details page:

   a. On the Details page, you can:

      - Choose the default SELinux mode for the installed system.
      - Enable or disable Spacewalk configuration file management by selecting or deselecting the **Enable Spacewalk Configuration Management** check box.

        Note

        You must also include the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages for installation.

      - Enable or disable Spacewalk remote commands by selecting or deselecting the **Enable Spacewalk Remote Commands** check box.

        Note

        You must also include the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages for installation.

      - Choose whether to reuse an existing profile, replace the existing profile, or create a new profile but retain the existing profile.
      - Change the root password for installed systems.

        Note

        If you make any other changes on this page, you must re-enter and verify the root password.

      Click **Update System Details** to save your changes.

   b. Select **Locale**, select the default time zone for installed systems and whether the hardware clock uses UTC, and click **Update Locale Preferences** to save your changes.

   c. Select **Partitioning**, define the partitions to be created during installation, and click **Update Partitions** to save your changes.

      Note

      Clear the partitioning configuration if you select the automatic-partitioning option `autopart` on the Advanced Options page.

   d. Select **GPG & SSL** to display a list of the GPG keys and SSL certificates that are known to Spacewalk, select the keys and certificates that should be imported into the `%post` section of the kickstart profile, and click **Update Keys** to save your selection.

      For information about adding a GPG key or SSL certificate to Spacewalk, see Section 4.4.1, “Adding GPG Keys and SSL Certificates Using the Spacewalk Web Interface”.

7. Select **Software** to display the Package Groups page:

a. Edit the list of packages to be installed:

   - For sample lists of packages, see Appendix B, *Sample Package Lists*.
   - The `@ Base` entry installs a minimal group of packages that are required to install a system.

     If you want to specify the list of base packages explicitly, select the **Don't install @Base package group** check box.
   - If you do not want the installation to halt if it cannot locate a package, select the **Ignore missing packages** check box.
   - If you have associated the Spacewalk Client channel with the profile, Spacewalk installs the Spacewalk Client packages automatically. You do not need to specify them in this list.
   - If you enable configuration file management and remote commands by selecting the **Enable Spacewalk Configuration Management** and **Enable Spacewalk Remote Commands** check boxes on the Details page, include the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages.
   - If you want to be able to apply updates and actions to a client system immediately from the Spacewalk server, include the `osad` package.
   - For Oracle Linux 5 installations, exclude the `pirut`, `up2date`, and `up2date-gnome` packages from installation by inserting a dash character (-) in front of the package names, for example:

     ```
     @Base
     -pirut
     -up2date
     -up2date-gnome
     ```

     You must exclude these packages to allow the Spacewalk client software to install correctly.

b. Click **Update Packages** to save your changes.

8. Select **Activation Keys**, select the activation key to associate with the profile, and click **Update Activation Keys** to save your changes.

> **Note**
>
> A Spacewalk server activates the channels that are associated with an activation key when it registers the Spacewalk client at the end of the provisioning process. Enabling the Spacewalk Client channel by specifying the activation key is not sufficient to install the Spacewalk client software during the kickstart process. Instead, you must specify the packages in the kickstart profile. The channels that are available to a Spacewalk client during a kickstart installation and the channels that are available after installation are

> independent. You can use channels during a kickstart installation that are not available after installation if the activation key does not enable them.

9. Select **Scripts** to define commands that you want to run on the system before or after installation.

   You can configure a pre- or post-installation script by using the following fields:

   Scripting Language
   (Optional) The path name of the script language interpreter, such as `/usr/bin/python`.

   Leave blank if you want to run `bash` shell commands.

   Script Name
   Enter a name for the script.

   Script Contents
   Select the script type from the pull-down list: **Shell**, **XML**, **Ruby**, **Python**, or **perl**, and enter the script in the text area.

   Script Execution Time
   Select the time at which the script is executed from the pull-down list: **Pre Script** for before installation or **Post Script** for after installation.

   nochroot
   (Optional) Select if the script should run outside a `chroot` jail.

   erroronfail
   (Optional) Select to stop the installation if an error occurs when the script runs.

   Template
   (Optional) Select to enable Cobbler templating for the script.

> **Note**
>
> If you want to be able to apply updates and actions to a client system immediately from the Spacewalk server, include the `osad` package for installation, which contains the OSA daemon and use the following kickstart option to enable the `osad` service:
>
> ```
> services --enabled=osad
> ```
>
> If you do not enable configuration file management and remote commands by selecting the **Enable Spacewalk Configuration Management** and **Enable Spacewalk Remote Commands** check boxes on the Details page, you can alternatively include the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages for installation and configure `rhn-actions-control` to run on the client system in the post-installation shell, for example:
>
> ```
> rhn-actions-control --enable-all
> ```
>
> For more information, see the `rhn-actions-control(8)` manual page.

- To create a profile that contains a kickstart file that you upload or copy into Spacewalk:

  1. Click **upload new kickstart file**.

  2. On the Kickstart Details page, enter the key settings in the following fields:

     Label
     Enter a label for the profile. For example: `ol6-x86_64-custom`.

     Kickstartable Tree
     Select the kickstart distribution with which the profile is associated. For example: `ol6-x86_64-server`.

     Virtualization Type
     Select the virtualization type. For Oracle Linux installations on virtual machines that are hosted by Oracle VM or Oracle VM VirtualBox, select **None**.

  3. Do one of the following:

     - Copy and paste the contents of a kickstart file into the **File Contents** text box.

     - Click **Browse...**, select the path of a kickstart file and click **Upload file** to upload it to the **File Contents** text box.

  4. If necessary, edit the kickstart file contents in the **File Contents** text box.

  5. Click **Update**.

- To view a profile, select its entry to display its details.

- To modify a profile:

  1. Select the profile whose settings you want to modify.

  2. Select each tab and page that contains settings that you want to modify.

  3. Click the confirmation button on each page to save your changes.

- To delete a profile:

  1. Select the distribution that you want to delete.

  2. On the Kickstart Details page, click **delete kickstart** and then click **Delete Kickstart** to confirm.

4.4.3 Working with Kickstart Profiles Using spacecmd

To list all kickstart profiles, use the `kickstart_list` command.

```
spacecmd {SSM:0}> kickstart_list
ol6u6-x86_64-minimal
```

To display the details of a kickstart profile, use the `kickstart_details` command.

```
spacecmd {SSM:0}> kickstart_details ol6u6-x86_64-minimal
Name:        ol6u6-x86_64-minimal
Label:       ol6u6-x86_64-minimal
Tree:        ol6-x86_64-server
Active:      True
Advanced:    False
Org Default: False
```

```
Configuration Management: False
Remote Commands:          False

Software Channels
-----------------
ol6u6-x86_64

Advanced Options
----------------
auth --enableshadow --passalgo=sha256
bootloader --location mbr
clearpart --all
firewall --disabled
keyboard us
lang en_US
network --bootproto dhcp
rootpw $5$ZdYXHxbNqu76Q5dG$.KWiOPyrGk8V5q/FEqYbWpCZdD5St387sn7jOyPH400
selinux --permissive
timezone America/New_York
url --url /var/distro-trees/ol6-x86_64-server

Software
--------
@ Base

Crypto Keys
-----------
RHN-ORG-TRUSTED-SSL-CERT

Variables
---------
org = 1
```

To display the contents of the kickstart file that a profile generates, use the `kickstart_getcontents` command.

```
spacecmd {SSM:0}> kickstart_getcontents ol6u6-x86_64-minimal
# Kickstart config file generated by Spacewalk Config Management
# Profile Label : ol6u6-x86_64-minimal
# Date Created  : 2015-06-11 11:34:15.157666

install
text
network --bootproto dhcp
url --url http://swksvr.mydom.com/ks/dist/ol6-x86_64-server
lang en_US
keyboard us
zerombr
clearpart --all
bootloader --location mbr
timezone America/New_York
auth --enableshadow --passalgo=sha256
rootpw --iscrypted $5$ZdYXHxbNqu76Q5dG$.KWiOPyrGk8V5q/FEqYbWpCZdD5St387sn7jOyPH400
selinux --permissive
reboot
firewall --disabled
skipx
autopart
...
```

`spacecmd` provides a large number of commands for managing kickstart profiles. Use the `help` command to find out more information, for example:

```
spacecmd {SSM:0}> help
```

```
Documented commands (type help <topic>):
========================================
...
kickstart_addactivationkeys
kickstart_addchildchannels
kickstart_addcryptokeys
kickstart_addfilepreservations
kickstart_addoption
kickstart_addpackages
kickstart_addscript
kickstart_addvariable
kickstart_clone
kickstart_create
kickstart_delete
kickstart_details
kickstart_diff
kickstart_disableconfigmanagement
kickstart_disableremotecommands
kickstart_enableconfigmanagement
kickstart_enablelogging
kickstart_enableremotecommands
kickstart_export
kickstart_getcontents
kickstart_getupdatetype
kickstart_import
kickstart_import_raw
kickstart_importjson
kickstart_list
kickstart_listactivationkeys
kickstart_listchildchannels
kickstart_listcryptokeys
kickstart_listcustomoptions
kickstart_listoptions
kickstart_listpackages
kickstart_listscripts
kickstart_listvariables
kickstart_removeactivationkeys
kickstart_removechildchannels
kickstart_removecryptokeys
kickstart_removefilepreservations
kickstart_removeoptions
kickstart_removepackages
kickstart_removescript
kickstart_removevariables
kickstart_rename
kickstart_setcustomoptions
kickstart_setdistribution
kickstart_setlocale
kickstart_setpartitions
kickstart_setselinux
kickstart_setupdatetype
kickstart_updatevariable
...
spacecmd {SSM:0}> help kickstart_create
kickstart_create: Create a Kickstart profile
usage: kickstart_create [options]

options:
  -n NAME
  -d DISTRIBUTION
  -p ROOT_PASSWORD
  -v VIRT_TYPE ['none', 'para_host', 'qemu', 'xenfv', 'xenpv']
```

4.5 Installing Client Systems Using Kickstart

To install a client system from a generated kickstart file, do one of the following:

- Boot the system from a real or virtual CD-ROM drive, using a boot ISO image or a full DVD image that you have downloaded from the Oracle Software Delivery Cloud at https://edelivery.oracle.com/linux, specifying the network location of the kickstart file as a boot option.

  This installation method is suitable for installing virtual machines or if you need to install only a small number of bare-metal systems at a local site.

- Boot the system from the network, having configured DHCP to support network booting of PXE clients and Cobbler to support the requirements of individual clients.

  This installation method is suitable for installing virtual machines or if you need to install bare-metal systems at both local and remote sites.

4.5.1 Configuring Cobbler and DHCP to Support Network Booting

The procedure in this section assumes that you configure a DHCP server on the same system as the Spacewalk server.

To configure Cobbler and DHCP to support booting client systems across the network:

1. Install the `cobbler-loaders` and `dhcp` packages:

   ```
   # yum install cobbler-loaders dhcp
   ```

2. To configure Cobbler to manage the DHCP service, edit `/etc/cobbler/settings` and modify the `manage_dhcp` setting:

   ```
   manage_dhcp: 1
   ```

3. Edit the DHCP server configuration template file `/etc/cobbler/dhcp.template` and change the subnet configuration for your local configuration.

   The following example demonstrates how to select either the pxelinux boot loader for BIOS-based PXE clients or the GRUB boot loader for UEFI-based PXE clients:

   ```
   # ******************************************************************
   # Cobbler managed dhcpd.conf file
   #
   # generated from cobbler dhcp.conf template ($date)
   # Do NOT make changes to /etc/dhcpd.conf. Instead, make your changes
   # in /etc/cobbler/dhcp.template, as /etc/dhcpd.conf will be
   # overwritten.
   #
   # ******************************************************************

   ddns-update-style interim;

   allow booting;
   allow bootp;

   ignore client-updates;
   set vendorclass = option vendor-class-identifier;
   option pxe-system-type code 93 = unsigned integer 16;
   set pxetype = option pxe-system-type;

   option domain-name "mydom.com";
   ```

```
subnet 192.168.1..0 netmask 255.255.255.0 {
  option domain-name-servers 192.168.1.1;
  option broadcast-address 192.168.1.255;
  option routers 192.168.1.254;
  default-lease-time 14400;
  max-lease-time 28800;
  pool {
    range 192.168.1.101 192.168.1.200;
  }
}

#for dhcp_tag in $dhcp_tags.keys():
    ## group could be subnet if your dhcp tags line up with your subnets
    ## or really any valid dhcpd.conf construct ... if you only use the
    ## default dhcp tag in cobbler, the group block can be deleted for a
    ## flat configuration
# group for Cobbler DHCP tag: $dhcp_tag
group {
        #for mac in $dhcp_tags[$dhcp_tag].keys():
            #set iface = $dhcp_tags[$dhcp_tag][$mac]
    host $iface.name {
        hardware ethernet $mac;
        #if $iface.ip_address:
        fixed-address $iface.ip_address;
        #end if
        #if $iface.hostname:
        option host-name "$iface.hostname";
        #end if
        #if $iface.netmask:
        option subnet-mask $iface.netmask;
        #end if
        #if $iface.gateway:
        option routers $iface.gateway;
        #end if
        if substring(vendorclass, 0, 9)="PXEClient" {
          if pxetype=00:06 or pxetype=00:07 {
              filename "/grub/grub.efi";
          } else {
              filename "/pxelinux.0";
          }
        }
        ## Cobbler defaults to $next_server, but some users
        ## may like to use $iface.system.server for proxied setups
        next-server $next_server;
        ## next-server $iface.next_server;
    }
        #end for
}
#end for
```

The example also configures a pool of generally available IP addresses in the range 192.168.1.101 through 192.168.1.200 on the 192.168.1/24 subnet. Systems in this pool do not boot using PXE.

All comments or commented-out DHCP directives in `/etc/cobbler/dhcp.template` are preceded by a double hash (`##`) to prevent Cobbler from interpreting them.

Spacewalk configures Cobbler to use TFTP to serve the boot-loader configuration files from the `/var/lib/tftpboot` directory. For more information about the format of these files, see Section 4.5.3, “About Boot-Loader Configuration Files”.

If you want DHCP to support network booting of iPXE clients, see Section 4.5.4, “Configuring DHCP to Support iPXE Clients”.

4. If SELinux is enabled in enforcing mode on your system, configure SELinux for Cobbler operation:

   a. Permit the `httpd` service to act as a proxy for Cobbler.

   ```
   # setsebool -P httpd_can_network_connect=1
   ```

   b. Set the `public_content_t` file type on the `/var/lib/tftpboot` and `/var/www/cobbler/images` directory hierarchies.

   ```
   # /usr/sbin/semanage fcontext -a -t public_content_t "/var/lib/tftpboot/.*"
   # /usr/sbin/semanage fcontext -a -t public_content_t "/var/www/cobbler/images/.*"
   ```

   Note

   The `semanage` command is provided by the `policycoreutils-python` package.

5. Restart the `cobblerd` service:

   ```
   # service cobblerd restart
   ```

6. Start the `httpd` service and configure it to start after a reboot.

   ```
   # service httpd start
   # chkconfig httpd on
   ```

   Note

   If you make any changes to `/etc/cobbler/dhcp.template`, run the `cobbler sync` command.

   If you make any changes to `/etc/cobbler/settings`, restart the `cobblerd` service and then run the `cobbler sync` command.

7. To support booting of UEFI-based PXE clients, copy `/boot/efi/EFI/redhat/grub.efi` to `/var/lib/tftpboot/grub`.

   ```
   # cp /boot/efi/EFI/redhat/grub.efi /var/lib/tftpboot/grub
   ```

8. Configure the firewall to allow access by DHCP requests.

   For example, for Oracle Linux 6:

   ```
   # iptables -I INPUT -i eth1 -p udp --dport 67:68 --sport 67:68 -j ACCEPT
   # service iptables save
   ```

   In this example, the server expects to receive requests on interface `eth1`.

   For example, for Oracle Linux 7:

   ```
   # firewall-cmd --permanent --zone=public --remove-interface=enp0s3
   # firewall-cmd --permanent --zone=internal --add-interface=enp0s3
   # firewall-cmd --permanent --zone=internal --add-port=67/udp
   # firewall-cmd --permanent --zone=internal --add-port=68/udp
   # firewall-cmd --reload
   ```

   In this example, the server expects to receive requests on interface `enp0s3` in the `internal` zone.

4.5.2 Adding a PXE Client to be Provisioned by Spacewalk

To add a PXE client to be provisioned by Spacewalk:

1. List the kickstart profiles in Spacewalk that are usable by Cobbler.

   ```
   # cobbler profile list
      ol6u6-x86_64-devsys:1:SpacewalkDefaultOrganization
      ol6u6-x86_64-server:1:SpacewalkDefaultOrganization
   ```

2. Use the `cobbler system add` command to define the host name, MAC address, and IP address of the target PXE client and the profile that you want to install, for example:

   ```
   # cobbler system add --name=svr1.mydom.com --hostname=svr1.mydom.com --mac=08:00:27:c6:a1:16 \
     --ip=92.168.1.253 --profile=ol6u6-x86_64-server:1:SpacewalkDefaultOrganization
   ```

   If you are provisioning a client that uses an IP address from a DHCP address pool, you might use a command such as the following:

   ```
   # cobbler system add --name=devsys2 --hostname=devsys2 \
     --profile=ol6u6-x86_64-devsys:1:SpacewalkDefaultOrganization \
     --kopts="ksdevice=eth0"
   ```

   The `--kopts` option allows you to specify options to be added to the kernel boot line. In this example, `ksdevice=eth0` specifies the network interface that kickstart should use for installation, which prevents the installation pausing to prompt you to choose which network interface to use.

3. By default, GRUB displays a boot menu for UEFI-based clients and prompts you to choose an entry. To prevent GRUB from displaying this menu, edit `/etc/cobbler/pxe/grubsystem.template` and add `default=0`, `hiddenmenu`, and `timeout=0` entries, for example:

   ```
   default=0
   hiddenmenu
   timeout=0

   title $profile_name
       root (nd)
       kernel $kernel_path $kernel_options
       initrd $initrd_path
   ```

4. Run `cobbler sync`.

   ```
   # cobbler sync
   task started: YYYY-MM-DD_hhmmss_sync
   task started (id=Sync, time=date)
   ...
   generating PXE configuration files
   generating: /var/lib/tftpboot/pxelinux.cfg/01-08-00-27-c6-a1-16
   generating: /var/lib/tftpboot/grub/01-08-00-27-c6-a1-16
   rendering DHCP files
   generating /etc/dhcp/dhcpd.conf
   ...
   *** TASK COMPLETE ***
   ```

   Cobbler creates pxelinux and GRUB boot configuration files for the client in `/var/lib/tftpboot/pxelinux.cfg` and `/var/lib/tftpboot/grub`. These files are named for the client's MAC address prefixed by `01-`, which represents the ARP hardware type for Ethernet, and use dashes to separate each byte value instead of colons. These client-specific files are based on `/etc/cobbler/pxe/pxesystem.template` and `/etc/cobbler/pxe/grubsystem.template`.

Cobbler also creates generic pxelinux.cfg/default and grub/efidefault boot configuration files from /etc/cobbler/pxe/pxeprofile.template and /etc/cobbler/pxe/grubprofile.template.

Cobbler adds an entry for the client to /etc/dhcp/dhcpd.conf, which is based on /etc/cobbler/dhcp.template, for example:

```
# group for Cobbler DHCP tag: default
group {
    host generic1 {
        hardware ethernet 08:00:27:c6:a1:16;
        fixed-address 192.168.1.253;
        option host-name "svr1.mydom.com";
        if substring(vendorclass, 0, 9)="PXEClient" {
          if pxetype=00:06 or pxetype=00:07 {
              filename "/grub/grub.efi";
          } else {
              filename "/pxelinux.0";
          }
        }
        next-server swksvr.mydom.com;
    }
}
```

5. Enter the cobbler system list command to display the PXE systems that are known to Cobbler.

```
# cobbler system list
   svr1.mydom.com
```

4.5.3 About Boot-Loader Configuration Files

A boot-loader configuration file for BIOS-based PXE clients uses pxelinux configuration settings, for example:

```
default ol6u6
prompt 0
timeout 1
label ol6u6
        kernel /images/ol6-x86_64:1:SpacewalkDefaultOrganization/vmlinuz
        ipappend 2
        append initrd=/images/ol6-x86_64:1:SpacewalkDefaultOrganization/initrd.img \
          ksdevice=bootif lang=en_US kssendmac text \
          ks=http://192.168.1.3/cblr/svc/op/ks/system/svr1.mydom.com
```

Do not use the \ line-continuation character. This character is used in the example to denote that the line has been broken for printing. The append directive and all of its arguments must be on the same line.

To allow the boot: prompt to be displayed, change the value of prompt to 1. To display the prompt, press Shift or Alt at the console.

The default directive identifies the default boot entry by its label value, ol6u6.

Pxelinux boots the client using the default boot entry after timeout/10 seconds.

The kernel directive defines the name of the kernel executable and the append directive defines any parameters that should be appended when loading the kernel, such as the name of the ram-disk image and the location of the kickstart file.

The ipappend 2 directive specifies that the Installer should use the same network interface as the system used to boot.

For pxelinux, the kernel and ram-disk image file paths are relative to /var/lib/tftpboot. The default boot loader configuration file for pxelinux is /var/lib/tftpboot/pxelinux.cfg/default

A boot-loader configuration file for UEFI-based PXE clients uses GRUB configuration settings, for example:

```
default=0
hiddenmenu
timeout=0

title ol6u6-x86_64-server:1:SpacewalkDefaultOrganization
    root (nd)
    kernel /images/ol6-x86_64:1:SpacewalkDefaultOrganization/vmlinuz \
      ksdevice=bootif lang=en_US kssendmac text \
      ks=http://192.168.1.3/cblr/svc/op/ks/system/svr1.mydom.com
    initrd /images/ol6-x86_64:1:SpacewalkDefaultOrganization/initrd.img
```

Do not use the \ line-continuation character. This character is used in the example to denote that the line has been broken for printing. The kernel directive and all of its arguments must be on the same line.

The timeout=0 and hiddenmenu directives cause the default kernel to boot immediately without allowing you to press a key to display a menu or modify the configuration of a boot entry. The default kernel is defined as the first entry (0), which is the only entry listed in this file.

The root directive defines that the kernel and initial ram-disk image files are available on the network device (nd), indicating that the files are available using TFTP.

The kernel directive defines the name of the kernel executable and any parameters that should be appended when loading the kernel, such as the location of the installation packages, and how to access these packages. The initrd directive specifies the initial ram-disk image file.

For GRUB, the kernel and ram-disk image file paths are relative to /var/lib/tftpboot/grub. The default boot loader configuration file for GRUB is /var/lib/tftpboot/grub/efidefault

To support different types of client, a configuration file can be named for:

- A client's UUID (for example, a8943708-c6f6-51b9-611e-74e6ac80b93d)
- A client's MAC address prefixed by 01-, which represents the ARP hardware type for Ethernet, and using dashes to separate each byte value instead of colons (for example, 01-80-00-27-c6-a1-16)
- A client's IP address expressed in hexadecimal without any leading 0x (for example, C0A801FD represents the IP address 192.168.1.253)

Cobbler writes client boot configuration files to both /var/lib/tftpboot/grub and /var/lib/tftpboot/pxelinux.cfg to handle both UEFI or BIOS-based PXE clients.

The boot loader looks for a configuration file in the following order until it finds a matching file name:

- *UUID* (for example, a8943708-c6f6-51b9-611e-74e6ac80b93d)
- 01-*MAC_address* (for example, 01-80-00-27-c6-a1-16)
- Full 32 bits of the IP address (for example, C0A801FD)
- Most significant 28 bits of the IP address (for example, C0A801F)
- Most significant 24 bits of the IP address (for example, C0A801)
- Most significant 20 bits of the IP address (for example, C0A80)
- Most significant 16 bits of the IP address (for example, C0A8)

- Most significant 12 bits of the IP address (for example, C0A)
- Most significant 8 bits of the IP address (for example, C0)
- Most significant 4 bits of the IP address (for example, C)
- default (BIOS) or efidefault (EFI)

For more information about GRUB, enter the info grub command to access the GRUB manual.

For more information about pxelinux, see http://www.syslinux.org/wiki/index.php/PXELINUX.

4.5.4 Configuring DHCP to Support iPXE Clients

iPXE extends the capabilities of PXE in many ways, including:

- iPXE clients can boot using HTTP, iSCSI, AoE, and FCoE
- The boot process can be controlled using scripts
- DNS lookup is available
- Booting across wide area networks or the Internet is possible

The gpxelinux.0 boot loader provides some iPXE features, such as DNS lookup and HTTP file transfer, and is available in the syslinux package. It does not support iPXE commands or scripts.

You can use gpxelinux.0 with BIOS-based PXE clients and with UEFI-based PXE clients in legacy mode but not in UEFI mode.

To configure the DHCP service to support iPXE clients:

1. Edit the DHCP server configuration template file /etc/cobbler/dhcp.template:

   a. Add the following lines to define the iPXE options for DHCP:

```
option space ipxe;
option ipxe-encap-opts code 175 = encapsulate ipxe;
option ipxe.priority code 1 = signed integer 8;
option ipxe.keep-san code 8 = unsigned integer 8;
option ipxe.skip-san-boot code 9 = unsigned integer 8;
option ipxe.syslogs code 85 = string;
option ipxe.cert code 91 = string;
option ipxe.privkey code 92 = string;
option ipxe.crosscert code 93 = string;
option ipxe.no-pxedhcp code 176 = unsigned integer 8;
option ipxe.bus-id code 177 = string;
option ipxe.bios-drive code 189 = unsigned integer 8;
option ipxe.username code 190 = string;
option ipxe.password code 191 = string;
option ipxe.reverse-username code 192 = string;
option ipxe.reverse-password code 193 = string;
option ipxe.version code 235 = string;
option iscsi-initiator-iqn code 203 = string;
option ipxe.pxeext code 16 = unsigned integer 8;
option ipxe.iscsi code 17 = unsigned integer 8;
option ipxe.aoe code 18 = unsigned integer 8;
option ipxe.http code 19 = unsigned integer 8;
option ipxe.https code 20 = unsigned integer 8;
option ipxe.tftp code 21 = unsigned integer 8;
option ipxe.ftp code 22 = unsigned integer 8;
option ipxe.dns code 23 = unsigned integer 8;
option ipxe.bzimage code 24 = unsigned integer 8;
option ipxe.multiboot code 25 = unsigned integer 8;
option ipxe.slam code 26 = unsigned integer 8;
option ipxe.srp code 27 = unsigned integer 8;
option ipxe.nbi code 32 = unsigned integer 8;
option ipxe.pxe code 33 = unsigned integer 8;
option ipxe.elf code 34 = unsigned integer 8;
option ipxe.comboot code 35 = unsigned integer 8;
option ipxe.efi code 36 = unsigned integer 8;
option ipxe.fcoe code 37 = unsigned integer 8;
option ipxe.vlan code 38 = unsigned integer 8;
option ipxe.menu code 39 = unsigned integer 8;
option ipxe.sdi code 40 = unsigned integer 8;
option ipxe.nfs code 41 = unsigned integer 8;
```

b. If you do not use a proxy DHCP server, specify the following line to speed up negotiation with the DHCP server:

```
option ipxe.no-pxedhcp 1;
```

c. Add the following line to define the `user-class` option:

```
option user-class code 77 = string;
```

d. Configure the DHCP server to provide the IP addresses of name servers that iPXE clients can use to resolve domain names to IP addresses, for example:

```
option domain-name-servers 192.168.1.1, 192.168.1.4, 192.168.1.8;
```

e. Configure DHCP to specify the `gpxelinux.0` boot loader for non-iPXE clients and the URI of a boot script for iPXE clients, for example:

```
if exists user-class and option user-class = "iPXE" {
      filename "http://web.mydom.com/pxeboot.ipxe";
  } else {
      filename "gpxelinux.0";
  }
```

In this example, pure iPXE clients run the HTTP-served boot script `pxeboot.ipxe`.

The following is an example of a boot script for an iPXE client:

```
#!ipxe

dhcp
kernel http://swksvr.mydom.com/distro-trees/ol6u6-x86_64-server/images/pxeboot/vmlinuz
initrd http://swksvr.mydom.com/distro-trees/ol6u6-x86_64-server/images/pxeboot/initrd.img
boot vmlinuz initrd=initrd.img ksdevice=bootif lang=en_US kssendmac text \
ks=http://192.168.1.3/cblr/svc/op/ks/profile/ol6-x86_64-minimal:1:SpacewalkDefaultOrganization
```

`dhcp` configures the client's network interfaces.

`kernel` downloads the installation kernel.

`initrd` downloads the initial ram-disk image file.

`boot` boots the downloaded installation kernel. Boot line parameters, such as the name of the initial ram-disk file and the location of the kickstart file, are specified as additional arguments.

Do not use the `\` line-continuation character. This character is used in the example to denote that the line has been broken for printing. The `boot` command and all of its arguments must be on the same line.

For more information, see http://ipxe.org/scripting and http://ipxe.org/cmd.

Non-iPXE clients boot using `gpelinux.0`. A configuration file for `gpxelinux.0` is named in the same way as for `pxelinux.0` as described in Section 4.5.3, "About Boot-Loader Configuration Files". Unlike `pxelinux.0`, you can use HTTP to access the installation kernel and initial ram-disk image files.

The following is an example of a configuration file for `gpxelinux.0`:

```
prompt 0
default ol6u6
timeout 0

label ol6u6
kernel http://swksvr.mydom.com/distro-trees/ol6u6-x86_64-server/images/pxeboot/vmlinuz
append initrd=http://swksvr.mydom.com/distro-trees/ol6u6-x86_64-server/images/pxeboot/initrd.img \
ksdevice=bootif lang=en_US kssendmac text \
ks=http://192.168.1.3/cblr/svc/op/ks/profile/ol6-x86_64-minimal:1:SpacewalkDefaultOrganization
ipappend 2
```

Do not use the `\` line-continuation character. This character is used in the example to denote that the line has been broken for printing. The `append` keyword and all of its arguments must be on the same line.

2. Run the `cobbler sync` command:

   ```
   # cobbler sync
   task started: YYYY-MM-DD_hhmmss_sync
   task started (id=Sync, time=date)
   ...
   rendering DHCP files
   generating /etc/dhcp/dhcpd.conf
   ...
   *** TASK COMPLETE ***
   ```

   The Cobbler service regenerates the `/etc/dhcp/dhcpd.conf` file and reloads the `dhcpd` service.

   If you make any further changes to `/etc/cobbler/dhcp.template`, run the `cobbler sync` command. You do not need to run this command if you change the content of the boot loader configuration files.

4.6 Creating a Kickstart Profile in Cobbler

You can also create kickstart profiles in Cobbler outside of Spacewalk. As for Spacewalk, a profile defines how to configure an installation if the target client has to perform a certain role. For example, you might want to configure a system as a web or database server. To create a profile in Cobbler, you associate a kickstart file with a distribution.

Note

Cobbler-only profiles are not visible from within Spacewalk.

You can use the `cobbler profile list` command to list the profiles that are known to Cobbler, for example:

```
# cobbler profile list
   ol6u6-x86_64
```

To find out which kickstart file a profile uses, run the `cobbler profile report` command, for example:

```
# cobbler profile report ol6u6-x86_64 | grep Kickstart
Kickstart                      : /var/lib/cobbler/kickstarts/sample.ks
Kickstart Metadata             : {}
```

The default `sample.ks` and other kickstart files that Cobbler provides in `/var/lib/cobbler/kickstarts` are unlikely to be suitable for provisioning clients.

To create a new profile for a distribution:

1. Create the kickstart file to associate with a distribution.

   For example, the following file, named `ol6u6_basic_server.ks`, contains a kickstart definition for a basic Oracle Linux 6 server:

   ```
   # Oracle Linux 6 Basic Server
   # Use text-based installation
   text
   # Install using HTTP from a URL provided by Cobbler
   url --url=$tree
   # Define localized settings
   lang en_US.UTF-8
   keyboard us
   timezone --utc America/New_York
   # Configure network interface settings
   network --onboot yes --device eth0 --bootproto dhcp --noipv6
   # root password is an SHA-512 hash provided by Cobbler
   rootpw  --iscrypted $default_password_crypted
   authconfig --enableshadow --passalgo=sha512
   # Allow only SSH connections
   firewall --service=ssh
   # Configure SELinux enforcing mode
   selinux --enforcing
   # Perform a new installation, removing all existing partitions
   # before configuring the new boot loader and disk partitions
   install
   zerombr
   clearpart --drives=sda --all --initlabel
   bootloader --location=mbr --driveorder=sda --append="crashkernel=auto rhgb quiet"
   autopart
   # Shutdown and power off the system after installation is finished
   # to allow you to change the boot order or make other changes.
   poweroff
   ```

```
# Alternatives are halt (default), reboot, and shutdown,
# which might not be suitable for unattended installations

# Package groups and packages to be installed
%packages
...
%end
```

For sample package lists, see Appendix B, *Sample Package Lists*.

> **Note**
>
> This example requires that you configure an SHA-512 password hash for the `default_password_crypted` setting in `/etc/cobbler/settings`.

This example does not take advantage of the power of kickstart templating and snippets for managing large numbers of profiles and systems in Cobbler. For more information, see the `cobbler(1)` manual page and http://www.cobblerd.org/.

2. If SELinux is enabled in enforcing mode on your system and you create the kickstart file in a directory other than `/var/lib/cobbler/kickstarts`, for example `/var/kickstart`:

   a. Use the `semanage` command to define the default file type of the directory hierarchy as `cobbler_var_lib_t`, for example:

   ```
   # /usr/sbin/semanage fcontext -a -t cobbler_var_lib_t "/var/kickstart(/.*)?"
   ```

   b. Use the `restorecon` command to apply the file type to the entire directory hierarchy.

   ```
   # /sbin/restorecon -R -v /var/kickstart
   ```

   c. For each kickstart file in the directory, use the `chcon` command to set the SELinux user to `system_u`.

   ```
   # chcon -u system_u /var/kickstart/*.ks
   ```

   If SELinux is enabled in enforcing mode on your system and you create the kickstart file in `/var/lib/cobbler/kickstarts` or in a directory on which you have defined the default file type as `cobbler_var_lib_t`, use the `chcon` command to set the SELinux user of the file to `system_u`, for example:

   ```
   # chcon -u system_u ol6u6_basic_server.ks
   ```

   You can use the `ls -Z` command to display the context, for example:

   ```
   # ls -Z ol6u6_basic_server.ks
   -rw-rw-r--. root root system_u:object_r:cobbler_var_lib_t:s0 ol6u6_basic_server.ks
   ```

   The correct SELinux context for a kickstart file used by Cobbler is `system_u:object_r:cobbler_var_lib_t:s0`.

3. Use the `cobbler profile add` command to create the profile, for example:

   ```
   # cobbler profile add --name=ol6u6_basic_server --distro=ol6u6-x86_64 \
   ```

```
  --kickstart=/var/lib/cobbler/kickstarts/ol6u6_basic_server.ks
```

> **Note**
>
> If this command returns the error `kickstart not found` for a file that does exist at the specified path, the file's SELinux context is incorrect. See the previous step for details of how to set the correct SELinux context on a file.

4. Enter the `cobbler profile list` command to display the profiles that are now known to Cobbler.

   ```
   # cobbler profile list
      ol6u6-x86_64
      ol6u6_basic_server
   ```

   The `ol6u6-x86_64` profile is unlikely to be usable. If you want to remove a profile, use the `cobbler profile remove` command.

   ```
   # cobbler profile remove --name=ol6u6-x86_64
   # cobbler profile list
      ol6u6_basic_server
   ```

   > **Note**
   >
   > Removing a profile also removes any client `system` definitions that you have created from that profile.

You can now define PXE clients that Cobbler can provision based on a profile that you have created. See Section 4.6.1, “Adding a PXE Client to be Provisioned by Cobbler”.

4.6.1 Adding a PXE Client to be Provisioned by Cobbler

To add a PXE client to be provisioned by Cobbler:

1. Use the `cobbler system add` command to define the host name, MAC address, and IP address of the target PXE client and the profile that you want to install, for example:

   ```
   # cobbler system add --name=svr1 --hostname=svr1 --mac=08:00:27:c6:a1:16 \
     --ip=10.0.0.253 --profile=ol6u6_basic_server
   ```

   If you are provisioning a desktop client that uses an IP address from a DHCP address pool, you might use a command such as the following:

   ```
   # cobbler system add --name=devsys2 --hostname=devsys2 --profile=ol6u6_devsys --kopts="ksdevice=eth0"
   ```

   The `--kopts` option allows you to specify options to be added to the kernel boot line. In this example, `ksdevice=eth0` specifies the network interface that kickstart should use for installation, which prevents the installation pausing to prompt you to choose which network interface to use.

2. By default, GRUB displays a boot menu for UEFI-based clients and prompts you to choose an entry. To prevent GRUB from displaying this menu, edit `/etc/cobbler/pxe/grubsystem.template` and add `default=0`, `hiddenmenu`, and `timeout=0` entries, for example:

   ```
   default=0
   hiddenmenu
   timeout=0

   title $profile_name
       root (nd)
       kernel $kernel_path $kernel_options
   ```

```
    initrd $initrd_path
```

3. Run `cobbler sync`.

   ```
   # cobbler sync
   task started: YYYY-MM-DD_hhmmss_sync
   task started (id=Sync, time=date)
   ...
   generating PXE configuration files
   generating: /var/lib/tftpboot/pxelinux.cfg/01-08-00-27-c6-a1-16
   generating: /var/lib/tftpboot/grub/01-08-00-27-c6-a1-16
   rendering DHCP files
   generating /etc/dhcp/dhcpd.conf
   ...
   *** TASK COMPLETE ***
   ```

   Cobbler creates pxelinux and GRUB boot configuration files for the client in `/var/lib/tftpboot/pxelinux.cfg` and `/var/lib/tftpboot/grub`. These files are named for the client's MAC address prefixed by `01-`, which represents the ARP hardware type for Ethernet, and use dashes to separate each byte value instead of colons. These client-specific files are based on `/etc/cobbler/pxe/pxesystem.template` and `/etc/cobbler/pxe/grubsystem.template`.

   Cobbler also creates generic `pxelinux.cfg/default` and `grub/efidefault` boot configuration files from `/etc/cobbler/pxe/pxeprofile.template` and `/etc/cobbler/pxe/grubprofile.template`.

   Cobbler adds an entry for the client to `/etc/dhcp/dhcpd.conf`, which is based on `/etc/cobbler/dhcp.template`:

   ```
   # group for Cobbler DHCP tag: default
   group {
       host generic1 {
           hardware ethernet 08:00:27:c6:a1:16;
           fixed-address 10.0.0.253;
           option host-name "svr1";
           if substring(vendorclass, 0, 9)="PXEClient" {
             if pxetype=00:06 or pxetype=00:07 {
                 filename "/grub/grub.efi";
             } else {
                 filename "/pxelinux.0";
             }
           }
           next-server 10.0.0.6;
       }
   }
   ```

4. Enter the `cobbler system list` command to display the systems that are known to Cobbler.

   ```
   # cobbler system list
      svr1
      svr2
   ```

4.6.2 Removing a PXE Client Definition from Cobbler

To remove a PXE Client definition from Cobbler:

1. Enter the `cobbler system list` command to display the systems that are known to Cobbler.

   ```
   # cobbler system list
      svr1
      svr2
   ```

2. Use the `cobbler system remove` command to specify the name of the system that you want to remove, for example `svr2`:

   ```
   # cobbler system remove --name=svr2
   ```

3. Run `cobbler sync` to update the Cobbler configuration.

   ```
   # cobbler sync
   task started: YYYY-MM-DD_hhmmss_sync
   task started (id=Sync, time=date)
   ...
   generating PXE configuration files
   rendering DHCP files
   generating /etc/dhcp/dhcpd.conf
   ...
   *** TASK COMPLETE ***
   ```

4. Verify that `svr2` has been removed:

   ```
   # cobbler system list
      svr1
   ```

4.7 Provisioning KVM Hosts Using Spacewalk

Note

The procedure in this section outlines the steps for using Spacewalk to provision a KVM host. It requires the following prerequisites:

- You are familiar with how to set up and use activation keys and kickstart profiles in Spacewalk and how to configure Cobbler, DHCP, and boot loaders to support network installation of client systems.

  See Chapter 3, *Creating Activation Keys*, Section 4.4, “Working with Kickstart Profiles”, and Section 4.5, “Installing Client Systems Using Kickstart”.

- You have set up a base channel and Kickstartable tree for the Oracle Linux distribution that you want to install on the KVM host.

- The system that you configure as a KVM host must have VT-x acceleration enabled in the BIOS or UEFI firmware and be able to forward this capability to any KVM guests. Suitable systems are bare-metal systems with VT-x enabled and Oracle VM virtual machines that have been configured with this capability. Oracle VirtualBox virtual machines do not support this functionality and are not suitable.

To provision a KVM host:

1. In Spacewalk, create an activation key that is specific to KVM hosts on the desired platform: Oracle Linux 6 (x86_64) or Oracle Linux 7 (x86_64). Enter the key settings as follows:

   Description
   Enter a description for the key. For example: `Oracle Linux 7 (x86_64) KVM host`.

   Key
   Enter a meaningful label for the activation key. For example: `kvmhost-oraclelinux7-x86_64`.

   Usage
   Leave blank to allow unlimited use by clients.

Base Channels

Select the base channel with which the key is associated. For example: `Oracle Linux 7 (x86_64) Base`.

Add-on Entitlements

Select the **Provisioning** and either the **Virtualization** or **Virtualization Platform** entitlements.

> **Note**
>
> Entitlements are deprecated and will be replaced in a future version of Spacewalk. However, you must still configure entitlements for activation keys in Spacewalk 2.4
>
> The Provisioning entitlement allows Spacewalk to update packages, apply errata, or deploy configuration files on a client system that registers using this activation key.
>
> The Virtualization and Virtualization Platform entitlements are mutually exclusive. Virtualization allows up to four KVM guests, whereas Virtualization Platform allows unlimited KVM guests.
>
> If you want to enable the configuration file deployment feature, this option is available if you modify the activation key after creating it.

Universal Default

Select if the key should be used as the default activation key for all newly-registered systems.

> **Note**
>
> Oracle strongly recommends that you do not associate any channels with a universal default key. Spacewalk uses the universal default key if a key is not specified so it might be used by any version of any operating system.

2. In Spacewalk, create a kickstart profile for KVM host systems on the desired platform:

   a. Associate the activation key that you created in step 1 with the profile.

   b. Enter the profile settings as follows:

      Label
      Enter a label for the profile. for example: `kvmhost-ol7u2-x86_64`.

      Base Channel
      Select the base channel with which the distribution is associated. For example: `Oracle Linux 7 Update 2 (x86_64) Base`.

      Kickstartable Tree
      Select the kickstart distribution with which the profile is associated. For example: `ol7u2-x86_64-server`.

      Virtualization Type
      Select the virtualization type as **None**.

   c. Configure the software packages that kickstart should install on the host in addition to the `@Base` and `@Core` packages:

      Virtualization packages (required for a KVM host):

      - `@virtualization-hypervisor`
      - `@virtualization-tools`

      Virtualization packages (recommended):

      - `qemu-kvm-tools` (Provides debugging and diagnostic utilities.)
      - `virt-manager` (Provides a graphical Virtual Machine Manager that you can use with KVM.)
      - `virt-viewer` (Provides a graphical console client for connecting to virtual machines.)

      Graphical desktop packages (required to use the Virtual Machine Manager):

      - `@^graphical-server-environment` (Provides a full graphical server environment.)
      - `@fonts`
      - `@gnome-desktop` (Select an alternate desktop environment such as KDE if preferred.)
      - `@x11`

      Spacewalk client packages (recommended):

      - `rhncfg`
      - `rhncfg-actions`
      - `rhncfg-client`

      Suggested optional packages:

      - `@input-methods`
      - `@internet-browser`
      - `@multimedia`
      - `kexec-tools`

- osad (Allows you to apply updates and actions to a client system immediately from the Spacewalk server.)

d. In the kickstart profile, configure any kickstart advanced options that you require, such as keyboard, lang, or network.

e. Set up the %pre or %post sections for any pre or post-installation configuration that you want kickstart to perform.

   For example, you can enable configuration file management and remote commands by including the rhncfg, rhncfg-actions, and rhncfg-client packages and configuring rhn-actions-control to run in the post-installation shell:

   ```
   rhn-actions-control --enable-all
   ```

3. Configure Cobbler or DHCP to provide IP and TFTP settings so that the guest being installed can access the appropriate boot loader to continue the provisioning process.

4. Configure the boot-loader configuration file that the boot loader uses to locate the installation kernel, the ram-disk image, and the kickstart file served by Spacewalk.

5. Having set up the Spacewalk kickstart profile, Cobbler, DHCP, and boot-loader configuration, boot the target host system from the network to start the installation process.

4.8 Provisioning KVM Guests Using Spacewalk

Note

The procedure in this section outlines the steps for using Spacewalk to provision KVM guests. It requires the following prerequisites:

- You are familiar with how to set up and use activation keys and kickstart profiles in Spacewalk and how to configure Cobbler, DHCP, and boot loaders to support network installation of client systems.

  See Chapter 3, *Creating Activation Keys*, Section 4.4, “Working with Kickstart Profiles”, and Section 4.5, “Installing Client Systems Using Kickstart”.

- You are familiar with how to use KVM to configure a KVM guest, for example by using the graphical Virtual Machine Manager.

- You have set up a base channel and Kickstartable tree for the Oracle Linux distribution that you want to install on the KVM guest.

To provision a KVM guest:

1. In Spacewalk, create an activation key that is specific to KVM hosts on the desired platform: Oracle Linux 6 (x86_64) or Oracle Linux 7 (x86_64). Enter the key settings as follows:

   Description
   Enter a description for the key. For example: Oracle Linux 7 (x86_64) KVM guest.

   Key
   Enter a meaningful label for the activation key. For example: kvmguest-oraclelinux7-x86_64.

Usage

Leave blank to allow unlimited use by clients.

Base Channels

Select the base channel with which the key is associated. For example: `Oracle Linux 7 (x86_64) Base`.

Add-on Entitlements

Select the **Provisioning** entitlement.

> **Note**
>
> Entitlements are deprecated and will be replaced in a future version of Spacewalk. However, you must still configure entitlements for activation keys in Spacewalk 2.4
>
> The Provisioning entitlement allows Spacewalk to update packages, apply errata, or deploy configuration files on a client system that registers using this activation key.
>
> If you want to enable the configuration file deployment feature, this option is available if you modify the activation key after creating it.

Universal Default

Select if the key should be used as the default activation key for all newly-registered systems.

> **Note**
>
> Oracle strongly recommends that you do not associate any channels with a universal default key. Spacewalk uses the universal default key if a key is not specified so it might be used by any version of any operating system.

2. In Spacewalk, create a kickstart profile for KVM host systems on the desired platform:

   a. Associate the activation key that you created in step 1 with the profile.

   b. Enter the profile settings as follows:

      Label Enter a label for the profile. for example: kvmguest-ol7u2-x86_64.

      Base Channel Select the base channel with which the distribution is associated. For example: Oracle Linux 7 Update 2 (x86_64) Base.

      Kickstartable Tree Select the kickstart distribution with which the profile is associated. For example: ol7u2-x86_64-server.

      Virtualization Type For a KVM guest, select the virtualization type as **KVM Virtualized Guest**. KVM supports only HVM guests.

   c. Configure the software packages that kickstart should install on the host in addition to the @Base package. The intended function of the guest system determines the set of packages but Oracle recommends the following additional packages for a KVM guest that is also a Spacewalk client:

      - @guest-agents (Agents used when running under a hypervisor.)
      - @guest-desktop-agents (Agents used when running as a virtualized desktop.)
      - acpid (Allows you to control the power state of the guest from the host.)
      - osad (Allows you to apply updates and actions to a client system immediately from the Spacewalk server.)
      - rhncfg
      - rhncfg-actions
      - rhncfg-client

   d. In the kickstart profile, configure any kickstart advanced options that you require, such as keyboard, lang, or network.

   e. Set up the %pre or %post sections for any pre or post-installation configuration that you want kickstart to perform.

      For example, you can enable configuration file management and remote commands by including the rhncfg, rhncfg-actions, and rhncfg-client packages and configuring rhn-actions-control to run in the post-installation shell:

      ```
      rhn-actions-control --enable-all
      ```

3. If you want to install the guest by using PXE network booting and kickstart:

   a. Configure Cobbler or DHCP to provide IP and TFTP settings so that the guest being installed can access the appropriate boot loader to continue the provisioning process.

   b. Configure the boot-loader configuration file that the boot loader uses to locate the installation kernel, the ram-disk image, and the kickstart file served by Spacewalk.

   c. Having set up the Spacewalk kickstart profile, Cobbler, DHCP, and boot-loader configuration, boot the target guest system from the network to start the installation process.

   If you want to install the guest by using network installation, use a boot image made available over HTTP by the Spacewalk server. You can use a full ISO image, a UEK boot image, or a RHCK boot image in conjunction with kickstart, depending on your requirements.

Chapter 5 Registering Client Systems

Before you register a system with Spacewalk, you should create an activation key for use with client systems, as described in Chapter 3, *Creating Activation Keys*. It is possible to register a system without an activation key by providing a user name and password instead but Spacewalk does not perform channel subscription nor package installation in this case. Oracle recommends using an activation key that is specific to the Oracle Linux release and system architecture rather than a default activation key.

Spacewalk registration is usually performed by Spacewalk's provisioning service. For existing or manually installed systems, you can alternatively use the `rhnreg_ks` command to register the system with Spacewalk.

Note

Do not register a Spacewalk server or client with ULN. You can register a Spacewalk server as a client of itself to receive updates.

5.1 Registering a Client System Using Kickstart

If you install a system using a kickstart file generated from a Spacewalk profile, Spacewalk automatically registers the system as a Spacewalk client if the following conditions are met:

- The Spacewalk Client channel must be selected on the Modify Operating System page under the profile's **Kickstart Details** tab.
- An activation key is associated with the profile on the Kickstart Details page under the profile's **Activation Keys** tab.

5.2 Installing the Spacewalk Client Software and Registering a Client System Using rhnreg_ks

Note

Starting with Oracle Linux 7 Update 1, you do not need to install the Spacewalk Client 2.4 software before you register an Oracle Linux 7 or Oracle Linux 6 server with Spacewalk. See Section 5.3, “Registering a Client System Using rhnreg_ks Without First Installing the Spacewalk Client Software”.

To install the Spacewalk Client 2.4 software on an Oracle Linux server and register the server as a Spacewalk client:

1. Enable access to the Spacewalk Client repository.

   Download the latest the yum repository configuration file from https://yum.oracle.com/ and save it to the yum repositories directory (by default `/etc/yum.repos.d`). Edit the configuration file and enable the repository:

   - For Oracle Linux 7, enable the `ol7_spacewalk24_client` repository.

     Alternatively, create a `/etc/yum.repos.d/spacewalk24-client.repo` file with the following content:

     ```
     [ol7_spacewalk24_client]
     name=Spacewalk Client 2.4 for Oracle Linux 7 ($basearch)
     baseurl=https://yum.oracle.com/repo/OracleLinux/OL7/spacewalk24/client/$basearch/
     ```

```
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=1
```

- For Oracle Linux 6, enable the `ol6_spacewalk24_client` repository.

  Alternatively, create a `/etc/yum.repos.d/spacewalk24-client.repo` file with the following content:

  ```
  [ol6_spacewalk24_client]
  name=Spacewalk Client 2.4 for Oracle Linux 6 ($basearch)
  baseurl=https://yum.oracle.com/repo/OracleLinux/OL6/spacewalk24/client/$basearch/
  gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
  gpgcheck=1
  enabled=1
  ```

- For Oracle Linux 5, enable the `ol5_spacewalk24_client` repository.

  Alternatively, create a `/etc/yum.repos.d/spacewalk24-client.repo` file with the following content:

  ```
  [ol5_spacewalk24_client]
  name=Spacewalk Client 2.4 for Oracle Linux 5 ($basearch)
  baseurl=https://yum.oracle.com/repo/OracleLinux/OL5/spacewalk24/client/$basearch/
  gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
  gpgcheck=1
  enabled=1
  ```

2. For Oracle Linux 5 only, use the `rpm -e --nodeps` command to remove the `pirut`, `up2date`, and `up2date-gnome` packages.

   ```
   # rpm -e --nodeps pirut up2date up2date-gnome
   ```

3. Install the Spacewalk Client software:

   ```
   # yum install rhn-client-tools rhn-check rhn-setup rhnsd m2crypto yum-rhn-plugin
   ```

   This command replaces the existing packages and deletes any previous registration with ULN.

4. Download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to the server.

   In a browser tab, navigate to **`http://`*`swksvr_FQDN`*`/pub`**, where *`swksvr_FQDN`* is the fully qualified domain name of the Spacewalk server, and download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to `/usr/share/rhn/`.

   You can download the file by using `wget` from the command line, for example:

   ```
   # wget -q -O /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT \
     http://swksvr_FQDN/pub/RHN-ORG-TRUSTED-SSL-CERT
   ```

   Alternatively, you can install the package that is automatically generated when you install SSL certificates, for example:

   ```
   # yum install http://swksvr_FQDN/pub/rhn-org-trusted-ssl-cert-1.0-1.noarch.rpm
   ```

   You might need to specify a different URL if you replaced the SSL certificates after installing and configuring the Spacewalk server software.

5. Register the system with Spacewalk using the `rhnreg_ks` command, using the `--sslCACert` option to specify the certificate.

```
# rhnreg_ks --sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT \
  --serverUrl=https://swksvr_FQDN/XMLRPC --activationkey=activation_key
```

Specify the Spacewalk server or proxy by its fully qualified domain name.

If you need to re-register a Spacewalk client with a Spacewalk server, additionally specify the `--force` option.

6. Disable access to the Spacewalk Client repository in the Oracle Linux yum server repository configuration file, or delete `/etc/yum.repos.d/spacewalk24-client.repo`.

5.3 Registering a Client System Using rhnreg_ks Without First Installing the Spacewalk Client Software

Starting with Oracle Linux 7 Update 1, you do not need to install the Spacewalk Client 2.4 software before you register an Oracle Linux 7 or Oracle Linux 6 server with Spacewalk.

To register an Oracle Linux server as a Spacewalk client:

1. Download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to the server.

   In a browser tab, navigate to **`http://swksvr_FQDN/pub`**, where *`swksvr_FQDN`* is the fully qualified domain name of the Spacewalk server, and download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to `/usr/share/rhn/`.

   Alternatively, you can use `wget` from the command line, for example:

   ```
   # wget -q -O /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT \
     http://swksvr_FQDN/pub/RHN-ORG-TRUSTED-SSL-CERT
   ```

2. Register the system with Spacewalk using the `rhnreg_ks` command, using the `--sslCACert` option to specify the certificate.

   ```
   # rhnreg_ks --sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT \
     --serverUrl=https://swksvr_FQDN/XMLRPC --activationkey=activation_key
   ```

   Specify the Spacewalk server or proxy by its fully qualified domain name.

   If you need to re-register a Spacewalk client with a Spacewalk server, additionally specify the `--force` option.

3. To install the Spacewalk Client software after registration, subscribe the server to a Spacewalk Client 2.4 software channel and use the `yum` command to install the packages:

   ```
   # yum install rhn-client-tools rhn-check rhn-setup rhnsd m2crypto yum-rhn-plugin
   ```

   Note

   Oracle recommends that you install the Spacewalk client software after registration to support all of the features provided by Spacewalk, which include provisioning and auditing.

Chapter 6 Configuring Client Systems for Remote Management

By default, the `rhnsd` daemon on a client system connects to the Spacewalk server every four hours and performs any updates or actions that you have scheduled. If you install the OSA daemon, you can apply updates and actions to client systems immediately from the Spacewalk server.

To allow you to perform remote configuration of client system from Spacewalk, you can install the remote configuration client packages on the remote system.

6.1 Enabling the OSA Daemon in a Kickstart Profile Using the Spacewalk Web Interface

Note

The procedure in this section applies if you use Spacewalk to generate the kickstart file.

To configure a kickstart profile to install and enable the OSA daemon on a client system:

1. Go to **Systems**, select **Kickstart** and then **Profiles**.

2. Select the profile, and then select **Software** to display the Package Groups page.

3. On the Package Groups page, include `osad` in the list of packages to install.

4. Select **System Details** to display the Details page.

5. On the Details page, select **Advanced Options**, enable the `services` option and add the following entry:

   ```
   --enabled=osad
   ```

   Spacewalk adds the following option to the generated kickstart file:

   ```
   services --enabled=osad
   ```

   The `osad` service starts automatically at the default run level when the target client system reboots following installation.

6. Click **Update Kickstart Distribution** to save your changes.

6.2 Enabling the OSA Daemon in a Kickstart File

Note

The procedure in this section applies if you upload a kickstart file into a profile.

If you want to be able to apply updates and actions to a client system immediately from the Spacewalk server:

- Include the `osad` package for installation.

- Include the following kickstart option to enable the `osad` service:

```
services --enabled=osad
```

6.3 Enabling the OSA Daemon Manually

To install and enable the OSA daemon manually:

1. Log in as `root` on the client system.
2. Use the `yum` command to install the `osad` package:

   ```
   # yum install osad
   ```

3. Enable and start the `osad` service:

   - On an Oracle Linux 5 or Oracle Linux 6 client system:

     ```
     # chkconfig osad on
     # service osad start
     ```

   - On an Oracle Linux 7 client system:

     ```
     # systemctl enable osad
     # systemctl start osad
     ```

Note

If the `osad` service does not start and displays the error `SSLDisabledError`, edit `/etc/sysconfig/rhn/up2date` and verify that the entry for `serverURL` uses the fully qualified domain name of the Spacewalk server or proxy, for example:

```
serverURL=https://swksvr.mydom.com/XMLRPC
```

6.4 Enabling Remote Configuration in a Kickstart Profile Using the Spacewalk Web Interface

Note

The procedure in this section applies if you use Spacewalk to generate the kickstart file.

To configure a kickstart profile to install and enable the remote configuration client software on a client system:

1. Go to **Systems**, select **Kickstart** and then **Profiles**.
2. Select the profile, and then select **Software** to display the Package Groups page.
3. On the Package Groups page, include `rhncfg`, `rhncfg-actions`, and `rhncfg-client` in the list of packages to install.
4. Select **System Details** to display the Details page.
5. On the Details page, select the **Enable Spacewalk Configuration Management** and **Enable Spacewalk Remote Commands** check boxes.
6. Click **Update Kickstart Distribution** to save your changes.

6.5 Enabling Remote Configuration in a Kickstart File

Note

The procedure in this section applies if you upload a kickstart file into a profile.

If you want to be able to deploy configuration files and run commands remotely from the Spacewalk web interface:

- Include the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages for installation.
- Configure `rhn-actions-control` to run on the client system in the post-installation shell, for example:

  ```
  %post --nochroot
  rhn-actions-control --enable-all
  %end
  ```

  For more information, see the `rhn-actions-control(8)` manual page.

6.6 Enabling Remote Configuration Manually for Non-managed Client Systems

To install and configure remote configuration manually:

1. Log in as `root` on the client system.
2. Use the `yum` command to install the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages:

   ```
   # yum install rhncfg rhncfg-actions rhncfg-client
   ```

3. Use the `rhn-actions-control` command to configure the remote actions that the client permits, for example:

   ```
   # rhn-actions-control --enable-all
   ```

   The `--report` option lists the permitted remote actions.

   ```
   # rhn-actions-control --report
   deploy is enabled
   diff is enabled
   upload is enabled
   mtime_upload is enabled
   run is enabled
   ```

   For more information, see the `rhn-actions-control(8)` manual page.

6.7 Enabling Remote Configuration for Non-managed Client Systems Using the Spacewalk Web Interface

Note

If you want Spacewalk to install the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages automatically from a software channel, the channel label must contain the string `rhn-tools`, for example `ol7-spacewalk24-client-rhn-tools`.

To install and configure remote configuration for existing non-managed client systems:

1. In the Spacewalk web interface:

   a. Enable the software channel that contains the `rhncfg`, `rhncfg-actions`, and `rhncfg-client` packages for the client. See Chapter 9, *Updating Client Systems*.

   b. Go to **Configuration**, **Systems**, and then **Target Systems**.

   c. On the Target Systems page, select the client systems from the systems that are listed and click **Enable Spacewalk Configuration Management**.

2. Configure configuration management by running the following commands on each client system:

   a. Check for any queued pending actions:

   ```
   # rhn_check
   ```

   b. Configure the remote actions that the client permits, for example:

   ```
   # rhn-actions-control --enable-all
   ```

   The `--report` option lists the permitted remote actions.

   ```
   # rhn-actions-control --report
   deploy is enabled
   diff is enabled
   upload is enabled
   mtime_upload is enabled
   run is enabled
   ```

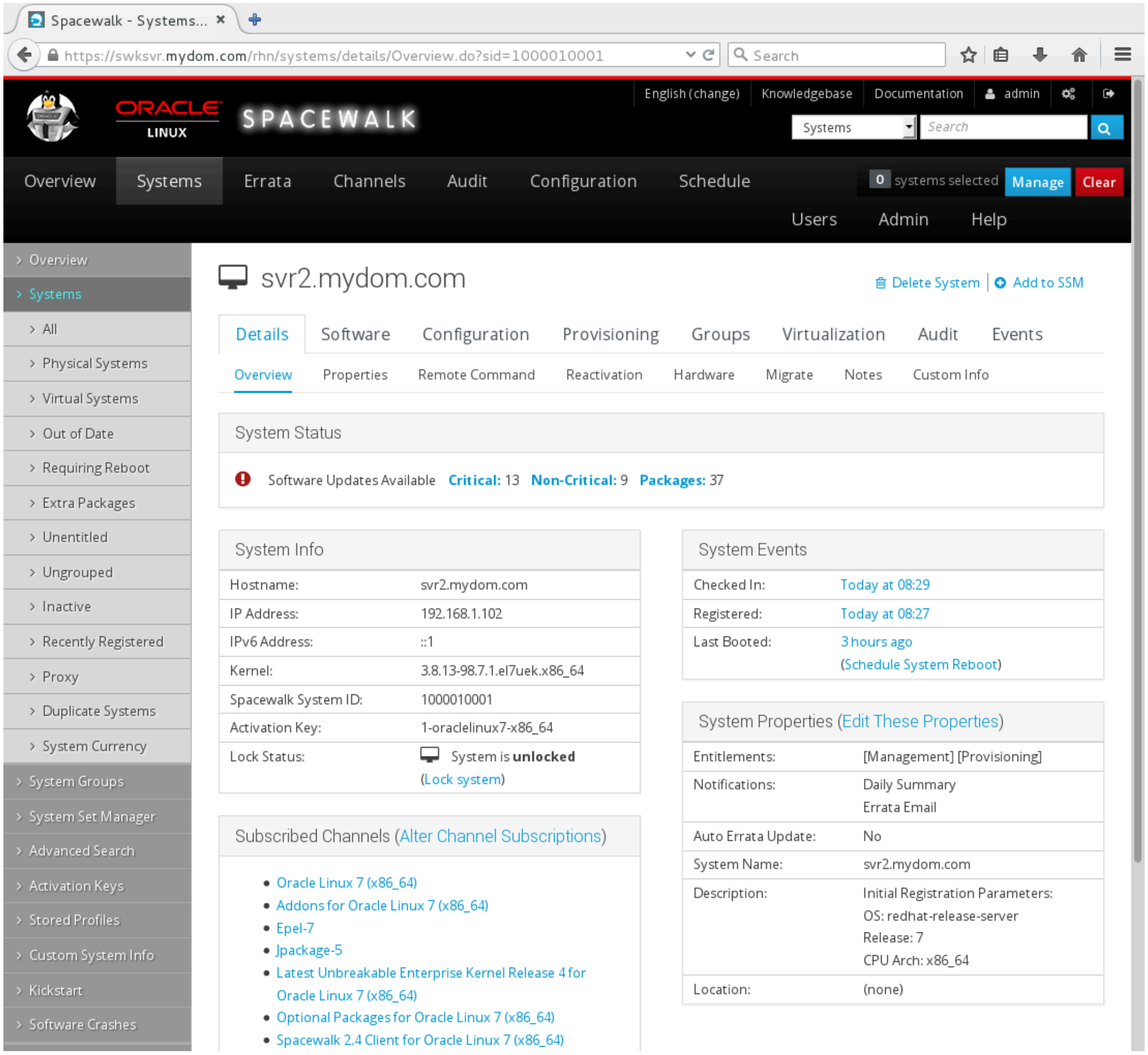
   For more information, see the `rhn-actions-control(8)` manual page.

Chapter 7 Querying the Status of Client Systems

You can use the Spacewalk web interface or `spacecmd` to query the status of client systems.

7.1 Querying the Status of a Client System Using the Spacewalk Web Interface

Figure 7.1 System Status Page



svr2.mydom.com

System Status

Software Updates Available **Critical:** 13 **Non-Critical:** 9 **Packages:** 37

System Info

Hostname:	svr2.mydom.com
IP Address:	192.168.1.102
IPv6 Address:	::1
Kernel:	3.8.13-98.7.1.el7uek.x86_64
Spacewalk System ID:	1000010001
Activation Key:	1-oraclelinux7-x86_64
Lock Status:	System is **unlocked** (Lock system)

System Events

Checked In:	Today at 08:29
Registered:	Today at 08:27
Last Booted:	3 hours ago (Schedule System Reboot)

System Properties (Edit These Properties)

Entitlements:	[Management] [Provisioning]
Notifications:	Daily Summary Errata Email
Auto Errata Update:	No
System Name:	svr2.mydom.com
Description:	Initial Registration Parameters: OS: redhat-release-server Release: 7 CPU Arch: x86_64
Location:	(none)

Subscribed Channels (Alter Channel Subscriptions)

- Oracle Linux 7 (x86_64)
- Addons for Oracle Linux 7 (x86_64)
- Epel-7
- Jpackage-5
- Latest Unbreakable Enterprise Kernel Release 4 for Oracle Linux 7 (x86_64)
- Optional Packages for Oracle Linux 7 (x86_64)
- Spacewalk 2.4 Client for Oracle Linux 7 (x86_64)

To verify the status of an active client system:

1. Go to **Systems** and select the client system from the list.

   The Overview page shows the following information for the client system:

   - The System Status pane shows how many critical errata updates, non-critical errata updates, and packages are available to install on the client system. Select **Critical**, **Non-Critical**, or **Packages** to view and optionally install the available errata and packages.

- The System Info pane shows the host name, IP addresses, kernel version, Spacewalk system ID, activation key, and whether the system is locked.
- The Subscribed Channels pane shows the base and child channels to which the client system is subscribed.
- The System Events pane shows when the client system last checked in, when it was registered, when it last booted, and when the OSA daemon last started.
- The System Properties pane shows the entitlements, notifications, automatic errata update status, system name, summary of the installed operating system, and location.

2. If the OSA status is shown as `online as of unknown`, select **Ping System**.
3. Wait a few seconds and then reload the page. The status should update and display when the OSA daemon was last started.

7.2 Querying the Status of a Client System in spacecmd

To verify the status of a client system, use the `system_details` command.

```
spacecmd {SSM:0}> system_details svr1.mydom.com
Name:          svr1.mydom.com
System ID:     1000010160
Locked:        False
Registered:    20150615T12:55:05
Last Checkin:  20150615T13:17:45
OSA Status:    online
Last Boot:     20150615T12:38:08

Hostname:      svr1.mydom.com
IP Address:    192.168.1.253
Kernel:        2.6.32-504.el6.x86_64

Activation Keys
---------------
1-ol6-x86_64

Software Channels
-----------------
oraclelinux6-x86_64
  |-- ol6_x86_64_spacewalk24_client
  |-- ol6_x86_64_uekr3_latest

Entitlements
------------
enterprise_entitled
provisioning_entitled
virtualization_host
```

Chapter 8 Configuring System Groups to Manage Client Systems

To allow you to perform the same actions on multiple client systems, you can create system groups. Typically, a system group contains systems that have a common installation base, architecture, and profile, for example Oracle Linux 6 (x86_64) servers.

If you manage large numbers of systems, creating system groups is a powerful way of applying errata, installing or upgrading packages, changing channel subscriptions, deploying configuration files, or reconfiguring kickstart provisioning with a minimum of effort.

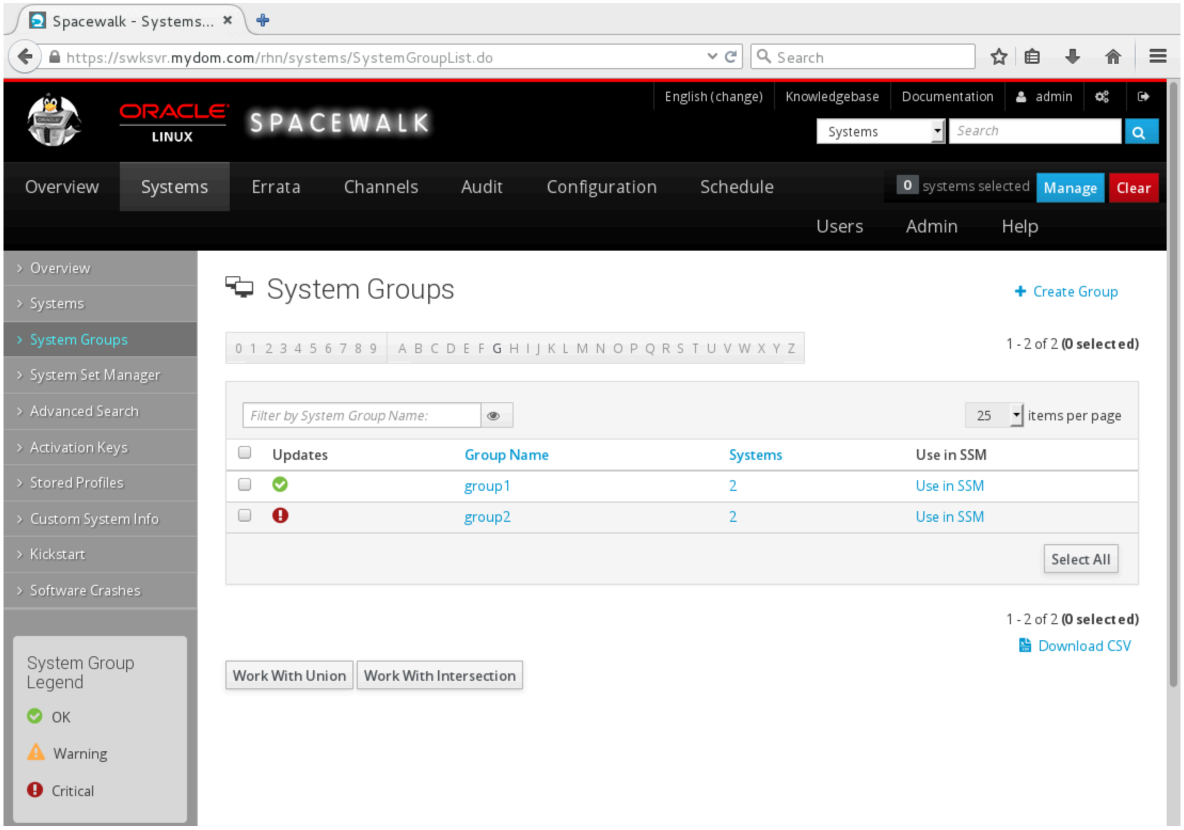
Spacewalk provides the System Set Manager, which maintains a current working system group or *system set* to which you can add or remove systems and system groups. You can perform actions on the systems in the system set or you can save the system set as a new system group.

Note

If a system is present in the system set, the Spacewalk web interface shows a check mark in its associated check box on the Systems page. You can select or deselect system check boxes to add or remove systems from the system set.

8.1 Working with System Groups Using the Spacewalk Web Interface

Figure 8.1 System Groups Page



☐	Updates	Group Name	Systems	Use in SSM
☐	✓	group1	2	Use in SSM
☐	!	group2	2	Use in SSM

Select **Systems** and then **System Groups**:

- To create a system group:

  1. Click **+ create new group**.

  2. On the Create System Group page, enter a name and description for the system group.

  3. Click **Create Group**.

- To add client systems to a system group:

  1. Click the system group name.

  2. Select the **Target Systems** tab.

  3. On the Target Systems page, select the check boxes for the systems that you want to add to the group and click **Add Systems**.

- To work with a system group:

  1. Click the system group name.

  2. On the Details page, click **work with group**.

     Spacewalk loads the group into the System Set Manager.

     The Selected Systems List page under System Set Manager displays the member systems of the system group. Any actions that you take on the tabs under System Set Manager apply only to these systems.

- To work with the union or intersection of two or more system groups:

  1. Select the check boxes next to the system groups.

  2. Click either **Work With Union** or **Work With Intersection**.

     - **Work With Union** creates a union group that includes all member systems of the selected groups.

     - **Work With Intersection** creates an intersection group that includes only systems that are members of all of the selected groups. If no systems are members of all of the groups, the intersection group does not have any members.

     - The Selected Systems List page under System Set Manager displays the member systems of the union or intersection group. Any actions that you take on the tabs under System Set Manager apply only to these systems.

     - To save a union or intersection group as a new system group, select the Groups tab, click **+ create new group**, enter a name and description for the system group, and click **Create Group**.

- To remove client systems from a system group:

  1. Click the system group name.

  2. Select the **Systems** tab.

  3. On the Systems page, select the check boxes of the systems that you want to remove from the group and click **Remove Systems**.

- To delete a system group:

  1. Click the system group name.

  2. Click **delete group** and then click **Confirm Deletion**.

8.2 Working with System Groups Using spacecmd

To create a system group, use the `group_create` command, for example:

```
spacecmd {SSM:0}> group_create group3 "Example system group 3"
```

To list system groups, use the `group_list` command, for example:

```
spacecmd {SSM:0}> group_list
group1
group2
group3
```

To add client systems to a system group, use the `group_addsystems` command.

```
spacecmd {SSM:0}> group_addsystems group3 svr1.mydom.com
```

You can also specify systems by the software channels to which they are subscribed or the results of a system search, for example:

```
spacecmd {SSM:0}> group_addsystems group3 channel:ol6-x86_64
spacecmd {SSM:0}> group_addsystems group3 ip:192.168.1
```

See Section 8.3, “Searching for Systems Using spacecmd”.

To display the details of a system group, use the `group_details` command.

```
spacecmd {SSM:0}> group_details group3
Name               group3
Description:       Example system group 3
Number of Systems: 1

Members
-------
svr1.mydom.com
```

To work with a system group, specify it using `group:`*`group_name`* to a `spacecmd` command, for example:

```
spacecmd {SSM:0}> system_listerrata group:group3
Security Errata
---------------
ELSA-2015-1115  Moderate:  openssl security update                   6/15/15
ELSA-2015-1072  Moderate:  openssl security update                    6/4/15
ELSA-2015-0863  Moderate:  glibc security and bug fix update         4/21/15
...
```

To create a union of two or more system groups, create an empty group and specify the groups to the `group_addsystems` command.

```
spacecmd {SSM:0}> group_create group4 "Example system group 4"
spacecmd {SSM:0}> group_addsystems group4 group:group1 group:group2
```

To create an intersection of two or more system groups, clear the contents of the system set in the System Set Manager, use the `ssm_intersect` command to create the intersection as the new system set, create an empty group and specify the system set as `ssm` to the `group_addsystems` command.

```
spacecmd {SSM:0}> ssm_clear
spacecmd {SSM:0}> ssm_intersect group:group1 group:group2
spacecmd {SSM:2}> group_create group5 "Example system group 5"
spacecmd {SSM:2}> group_addsystems group5 ssm
spacecmd {SSM:2}> ssm_clear
spacecmd {SSM:0}>
```

Note

`{SSM:N}` shows the number of systems that are members of the system set.

To remove client systems from a system group, use the `group_removesystems` command.

```
spacecmd {SSM:0}> group_removesystems group3 svr1.mydom.com
Systems
-------
svr1.mydom.com

Remove these systems [y/N]: y
```

To delete a system group, use the `group_delete` command.

```
spacecmd {SSM:0}> group_delete group3
group3

Delete these groups [y/N]: y
```

8.3 Searching for Systems Using spacecmd

To search for systems, use the `system_search` command.

```
spacecmd {SSM:0}> system_search criterion:value
```

You can search on the following criteria:

`device` System device name. For example: `"xen platform device"`.

`driver` System driver name. For example: `ata_piix`.

`hostname` FQDN of the system. For example: `svr1.mydom.com`.

`id` System ID in Spacewalk. For example: `1000010100`.

`ip` IP address. For example: `192.168.1`.

`name` System name in Spacewalk. For example: `svr1.mydom.com`.

`uuid` System UUID. For example: `0004fb0000060000a4d43e4f737f4f5d`.

`vendor` System vendor name. For example: `GenuineIntel`.

For example, search for systems that have an IP address that contains `192.168.1`:

```
spacecmd {SSM:0}> system_search ip:192.168.1
svr1.mydom.com    192.168.1.201
svr2.mydom.com    192.168.1.202
...
```

You can also use a `search` query instead of a system name with `spacecmd` commands, for example:

```
spacecmd {SSM:0}> group_addsystems group3 search:ip:192.168.1
```

To search for systems that subscribe to a software channel, use the `softwarechannel_listsystems` command.

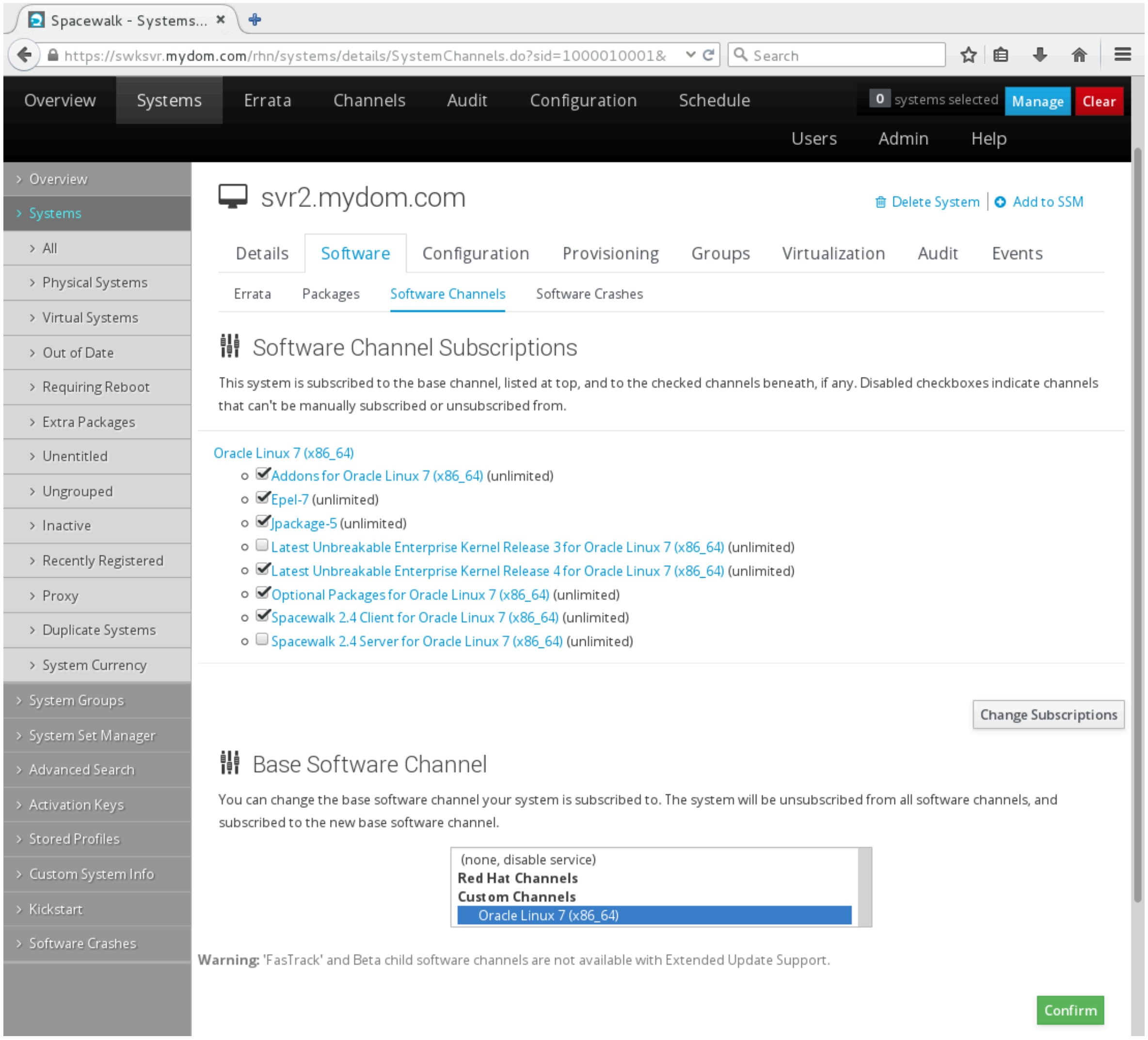
```
spacecmd {SSM:0}> softwarechannel_listsystems ol6-x86_64
svr1.mydom.com
svr2.mydom.com
...
```

Chapter 9 Updating Client Systems

You can use the Spacewalk web interface or `spacecmd` on the Spacewalk server to subscribe client systems to software channels and update the client systems from these channels. Alternatively, you can use the `spacewalk-channel` command on an individual Spacewalk client.

9.1 Subscribing Client Systems to Software Channels Using the Spacewalk Web Interface

Figure 9.1 Software Channel Subscriptions Page



svr2.mydom.com

Software Channel Subscriptions

This system is subscribed to the base channel, listed at top, and to the checked channels beneath, if any. Disabled checkboxes indicate channels that can't be manually subscribed or unsubscribed from.

Oracle Linux 7 (x86_64)

- ☑ Addons for Oracle Linux 7 (x86_64) (unlimited)
- ☑ Epel-7 (unlimited)
- ☑ Jpackage-5 (unlimited)
- ☐ Latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux 7 (x86_64) (unlimited)
- ☑ Latest Unbreakable Enterprise Kernel Release 4 for Oracle Linux 7 (x86_64) (unlimited)
- ☑ Optional Packages for Oracle Linux 7 (x86_64) (unlimited)
- ☑ Spacewalk 2.4 Client for Oracle Linux 7 (x86_64) (unlimited)
- ☐ Spacewalk 2.4 Server for Oracle Linux 7 (x86_64) (unlimited)

Base Software Channel

You can change the base software channel your system is subscribed to. The system will be unsubscribed from all software channels, and subscribed to the new base software channel.

(none, disable service)
Red Hat Channels
Custom Channels
Oracle Linux 7 (x86_64)

Warning: 'FasTrack' and Beta child software channels are not available with Extended Update Support.

To subscribe systems to software channels:

1. Go to **Systems** and click the system name.

2. Select **Software** and then select the **Software Channels** tab.

3. Change the child or base software channels:

- To change the child software channels to which a system is subscribed:

  a. In the Software Channel Subscriptions section, select or deselect the check boxes next to the child software channels to which you want to want to subscribe or unsubscribe the client.

  b. Click **Change Subscriptions**.

- To change the base software channel to which a system is subscribed:

  a. In the Base Software Channel section, select the new base software channel.

  b. Click **Confirm**.

  c. On the Confirm Base Software Channel page, click **Modify Base Software Change**.

Note

Changing the base software channel unsubscribes a system from all other software channels.

9.2 Subscribing Client Systems to Software Channels Using spacecmd

To list the base and child software channels to which a system is subscribed, use the `system_listbasechannel` and `system_listchildchannels` commands.

```
spacecmd {SSM:0}> system_listbasechannel svr1.mydom.com
ol6-x86_64
spacecmd {SSM:0}> system_listchildchannels svr1.mydom.com
ksplice-ol6-x86_64
ol6_x86_64_addons
ol6_x86_64_spacewalk24_client
ol6_x86_64_uekr3_latest
```

To list the available child channels of a base channel, use the `softwarechannel_listchildchannels` command.

```
spacecmd {SSM:0}> softwarechannel_listchildchannels oraclelinux6-x86_64
ksplice-ol6-x86_64
ol6_x86_64_addons
ol6_x86_64_playground
ol6_x86_64_spacewalk24_client
ol6_x86_64_spacewalk24_server
ol6_x86_64_uekr3_latest
```

To add or remove child channels, use the `system_addchildchannels` and `system_removechildchannels` commands.

```
spacecmd {SSM:0}> system_removechildchannels svr1.mydom.com ol6_x86_64_addons
Systems
-------
svr1.mydom.com

Removing Channels
-----------------
ol6_x86_64_addons

Is this ok [y/N]: y
```

```
spacecmd {SSM:0}> system_addchildchannels svr2.mydom.com ol6_x86_64_playground
Systems
-------
svr2.mydom.com

Adding Channels
---------------
ol6_x86_64_playground

Is this ok [y/N]: y
```

To list the available base channels, use the `softwarechannel_listbasechannels` command.

```
spacecmd {SSM:0}> softwarechannel_listbasechannels
oraclelinux7u0-x86_64
oraclelinux7u1-x86_64
```

To change the base channel to which a system is subscribed, use the `system_setbasechannel` command.

```
spacecmd {SSM:0}> system_setbasechannel svr5.mydom.com oraclelinux7u1-x86_64
System:           svr5.mydom.com
Old Base Channel: oraclelinux7u0-x86_64
New Base Channel: oraclelinux7u1-x86_64

Is this ok [y/N]: y
```

Note

Changing the base software channel unsubscribes a system from all other software channels.

You can change the subscribed channels for multiple systems by specifying the following arguments in place of a system name:

channel:*channel_name*

Matches systems that are subscribed to the specified software channel.

group:*group_name*

Specifies the systems in the named system group, for example:

```
spacecmd {SSM:0}> system_removechildchannels group:group3 ol6_x86_64_playground
Systems
-------
svr1.mydom.com
svr2.mydom.com

Removing Channels
-----------------
ol6_x86_64_playground

Is this ok [y/N]: y
```

search:*criterion*:*value*

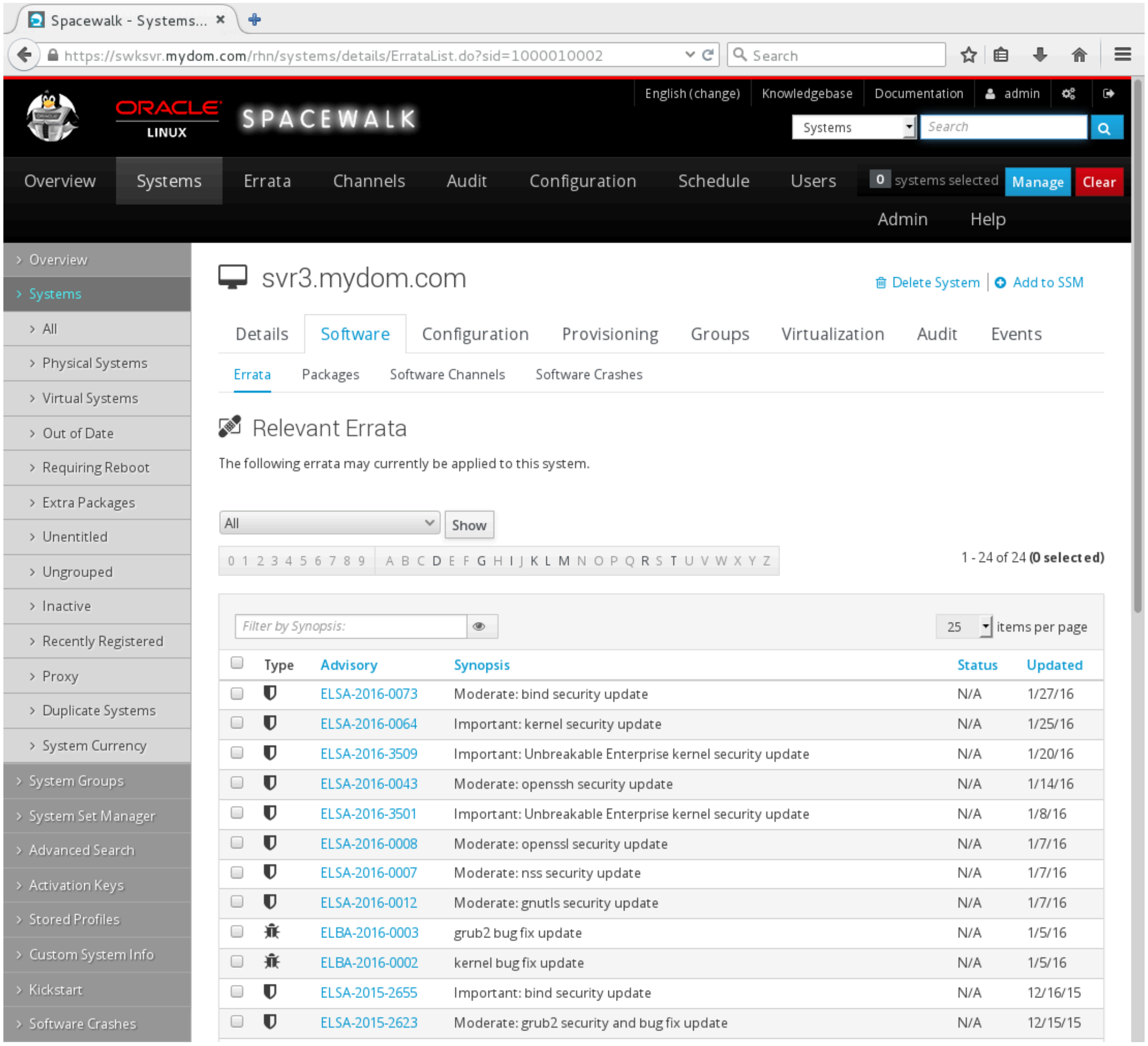
Matches systems that match a search criterion. See Section 8.3, “Searching for Systems Using spacecmd”.

ssm

Specifies the systems that are currently in the system set.

9.3 Listing and Applying Available Security Updates and Other Errata Using the Spacewalk Web Interface

Figure 9.2 Relevant Errata Page



Relevant Errata

The following errata may currently be applied to this system.

1 - 24 of 24 (0 selected)

☐	Type	Advisory	Synopsis	Status	Updated
☐	🛡	ELSA-2016-0073	Moderate: bind security update	N/A	1/27/16
☐	🛡	ELSA-2016-0064	Important: kernel security update	N/A	1/25/16
☐	🛡	ELSA-2016-3509	Important: Unbreakable Enterprise kernel security update	N/A	1/20/16
☐	🛡	ELSA-2016-0043	Moderate: openssh security update	N/A	1/14/16
☐	🛡	ELSA-2016-3501	Important: Unbreakable Enterprise kernel security update	N/A	1/8/16
☐	🛡	ELSA-2016-0008	Moderate: openssl security update	N/A	1/7/16
☐	🛡	ELSA-2016-0007	Moderate: nss security update	N/A	1/7/16
☐	🛡	ELSA-2016-0012	Moderate: gnutls security update	N/A	1/7/16
☐	🐞	ELBA-2016-0003	grub2 bug fix update	N/A	1/5/16
☐	🐞	ELBA-2016-0002	kernel bug fix update	N/A	1/5/16
☐	🛡	ELSA-2015-2655	Important: bind security update	N/A	12/16/15
☐	🛡	ELSA-2015-2623	Moderate: grub2 security and bug fix update	N/A	12/15/15

To list the available security updates and other errata for systems or system groups:

1. For systems:

   a. Go to **Systems** and click the system name.

   b. Select **Software** and then select the **Errata** tab.

      Alternatively, click **Critical** or **Non-Critical** in the System Status pane to display the Relevant Errata page with security advisory or non-critical errata selected for display.

   For system groups:

   a. Go to **System Groups** and click the system group name.

   b. On the **Details** page, click **work with group**.

      Spacewalk loads the group into the System Set Manager.

   c. In the System Set Manager, select the **Errata** tab.

2. On the Relevant Errata List page, select **All**, **Non-Critical**, **Bug Fix Advisory**, **Product Enhancement Advisory**, or **Security Advisory** from the pull-down list and click **Show**.

   - You can filter the list on the Synopsis value or sort the list by clicking **Advisory**, **Synopsis**, **Status**, **Affected** (system groups only), or **Updated**.

   - To see more details about an erratum listed under **Advisory**, select its name.

     The CVEs section lists the CVEs that are fixed by an erratum. Click on a CVE name for more details.

   - To display the packages that are affected by an erratum, select the **Packages** tab.

   - To display the systems to which you can apply the erratum, select the **Affected Systems** tab.

3. To apply errata to systems or system groups:

   a. Select the check boxes for the errata that you want to apply, or click **Select All** to select all of the listed errata.

   b. Click **Apply Errata**.

   c. On the Relevant Errata Confirm page, change the schedule if required, and click **Confirm**.

      The page updates to include a link to the scheduled action.

      If you have not edited the schedule and you have enabled the OSA daemon on the client, the OSA daemon usually installs the errata packages immediately. Otherwise, `rhnsd` applies the errata when it next runs on the client.

   d. Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the status and details of the errata update on the client.

9.4 Listing and Applying Available Security Updates and Other Errata Using spacecmd

To list the security, bug-fix, and product-enhancement advisory errata that are available for a client system, use the `system_listerrata` command:

```
spacecmd {SSM:0}> system_listerrata svr1.mydom.com
Security Errata
---------------
ELSA-2015-1072  Moderate:  openssl security update                    6/4/15
ELSA-2015-0863  Moderate:  glibc security and bug fix update         4/21/15
ELSA-2015-0794  Moderate:  krb5 security update                       4/9/15
ELSA-2015-0715  Moderate:  openssl security update                   3/23/15
ELSA-2015-0700  Moderate:  unzip security update                     3/18/15
ELSA-2015-0672  Moderate:  bind security update                      3/12/15
ELSA-2015-0092  Critical:  glibc security update                     1/27/15
ELSA-2015-0074  Important:  jasper security update                   1/22/15
ELSA-2015-0066  Moderate:  openssl security update                   1/20/15
```

```
...

Bug Fix Errata
--------------
ELBA-2015-1085  db4 bug fix update                                   6/10/15
ELBA-2015-1033  glibc bug fix update                                 5/27/15
ELBA-2015-1018  lvm2 bug fix update                                  5/20/15
...

Enhancement Errata
------------------
ELEA-2015-0913   tzdata enhancement update                           4/28/15
ELEA-2015-0855   tzdata enhancement update                           4/18/15
ELEA-2015-3031   kexec-tools enhancement update                      4/17/15
...
```

To find out more details about an erratum, use the `errata_details` command.

```
spacecmd {SSM:0}> errata_details ELSA-2015-1115
Name:       ELSA-2015-1115
Product:    Oracle Linux 6
Type:       Security Advisory
Issue Date: 6/15/15

Topic
-----


Description
-----------
[1.0.1e-42.8] - improved fix for CVE-2015-1791 - add missing parts of
CVE-2015-0209 fix for corectness although unexploitable  [1.0.1e-42.7]
- fix CVE-2014-8176 - invalid free in DTLS buffering code - fix
CVE-2015-1789 - out-of-bounds read in X509_cmp_time - fix
CVE-2015-1790 - PKCS7 crash with missing EncryptedContent - fix
CVE-2015-1791 - race condition handling NewSessionTicket - fix
CVE-2015-1792 - CMS verify infinite loop with unknown hash function -
fix CVE-2015-3216 - regression in RAND locking that can cause
segfaults on   read in multithreaded applications

CVEs
----
CVE-2014-8176
CVE-2015-1789
CVE-2015-1790
CVE-2015-1791
CVE-2015-1792
CVE-2015-3216

Solution
--------


References
----------


Affected Channels
-----------------
ol6u6-x86_64

Affected Systems
----------------
3
```

```
Affected Packages
-----------------
openssl-1.0.1e-30.el6_6.11.i686
openssl-1.0.1e-30.el6_6.11.x86_64
openssl-devel-1.0.1e-30.el6_6.11.i686
openssl-devel-1.0.1e-30.el6_6.11.x86_64
openssl-perl-1.0.1e-30.el6_6.11.x86_64
openssl-static-1.0.1e-30.el6_6.11.x86_64
```

To find the errata that fix a CVE, use the `errata_findbycve` command.

```
spacecmd {SSM:0}> errata_findbycve CVE-2015-3216
CVE-2015-3216:
ELSA-2015-1115
```

To list the systems to which you could apply an erratum, use the `errata_listaffectedsystems` command.

```
spacecmd {SSM:0}> errata_listaffectedsystems ELSA-2015-1115
ELSA-2015-1115:
svr1.mydom.com
svr2.mydom.com
svr3.mydom.com
```

To apply an erratum to a system, use the `system_applyerrata` command.

```
spacecmd {SSM:0}> system_applyerrata svr1.mydom.com ELSA-2015-1115
Errata             Systems
--------------     -------
ELSA-2015-1115           1

Apply these errata [y/N]: y
INFO: Scheduled 1 system(s) for ELSA-2015-1115
```

You can apply errata to multiple systems by specifying the following arguments in place of a system name:

`channel:`*`channel_name`*

Matches systems that are subscribed to the specified software channel.

`group:`*`group_name`*

Specifies the systems in the named system group.

`search:`*`criterion`*`:`*`value`*

Matches systems that match a search criterion. See Section 8.3, “Searching for Systems Using spacecmd”.

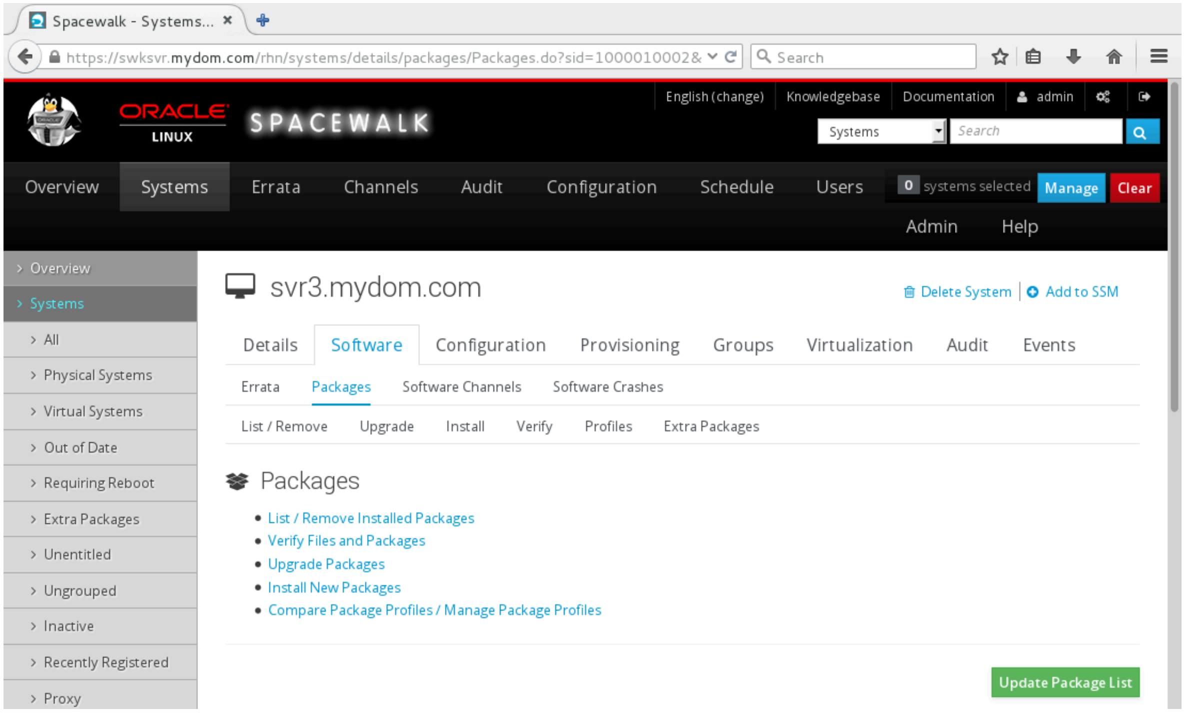
`ssm`

Specifies the systems that are currently in the system set, for example:

```
spacecmd {SSM:0}> ssm_add svr2.mydom.com svr3.mydom.com
spacecmd {SSM:2}> system_applyerrata ssm ELSA-2015-1115
Errata             Systems
--------------     -------
ELSA-2015-1115           2

Apply these errata [y/N]: y
INFO: Scheduled 2 system(s) for ELSA-2015-1115
spacecmd {SSM:2}> ssm_clear
spacecmd {SSM:0}>
```

9.5 Managing Packages for Systems Using the Spacewalk Web Interface

Figure 9.3 Packages Page



To manage packages for a system:

1. Go to **Systems** and click the system name.
2. Select **Software**.
3. On the Packages page, select the tab or link for the package operation that you want to perform:

   Extra Packages The Extra Packages page displays packages that are installed on a system, but which are not present in any of the subscribed channels.

   > **Note**
   >
   > If you registered an existing system, such as the Spacewalk server itself, as a client, it is possible that some of the installed packages are not present in any subscribed channel.
   >
   > If the Spacewalk server is a client of itself, Oracle recommends that you synchronize the Spacewalk Server repository and associate it with the server so that the server receives Spacewalk Server software updates.

   If one or more packages should not have been installed on a system:

   a. Select the packages that you want to remove and click **Remove Packages**.

b. On the Confirm Package Removal page, change the schedule if required, and click **Confirm**.

The page updates to include a link to the scheduled action.

If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually removes the packages immediately.

Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details and status of the package removals.

Install

a. On the Installable Packages page, select the packages that you want to install and click **Install Selected Packages**.

> **Tip**
>
> Use the package filter to locate a package.

To see more information about a package, click its name.

The Details page for the package lists any errata that include the package. To find out more information about an erratum, click its name.

The Details page for the erratum lists the CVEs that the erratum fixes. To find out more information about a CVE, click its name.

b. On the Confirm Package Install page, change the schedule if required, and click **Confirm**.

The page updates to include a link to the scheduled action.

If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually installs the packages immediately.

Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details and status of the package installations.

List/Remove

a. On the Removable Packages page, select the packages that you want to remove and click **Remove Packages**.

b. On the Confirm Package Removal page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually removes the packages immediately.

   Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details and status of the package removals.

Profiles

On the Profiles page, you can:

- Create a package profile from the set of packages that are currently installed on the system:

  a. Click **Create System Profile**.

  b. On the Create Stored Profile page, enter a name and description for the profile and then click **Create Profile**.

- Compare the packages installed on this system with a stored package profile for this system or for another system:

  - In the Compare to Stored Profile section, select the profile name from the pull-down list and click **Compare**.

- Compare the packages installed on this system with those installed on another system:

  - In the Compare to System section, select the system name from the pull-down list and click **Compare**.

Upgrade

a. On the Upgradable Packages page, select the packages that you want to upgrade and click **Upgrade Packages**.

b. On the Confirm Package Upgrade page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually upgrades the packages immediately.

   Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details and status of the package upgrades.

Verify

a. On the Verifiable Packages page, select the packages that you want to verify and click **Verify Selected Packages**.

b. On the Confirm Package Verification page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually verifies the packages immediately.

   Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details and status of the package verifications.

9.6 Managing Packages for Systems Using spacecmd

To create a package profile from the set of packages that are currently installed on a system, use the `system_createpackageprofile` command.

```
spacecmd {SSM:0}> system_createpackageprofile svr1.mydom.com -n svr1-profile1 -d "svr1 profile 1"
INFO: Created package profile 'svr1-profile1'
```

To compare the packages installed on this system with a stored package profile for this system or for another system, use the `system_comparepackageprofile` command.

```
spacecmd {SSM:0}> spacecmd {SSM:0}> system_comparepackageprofile svr2.mydom.com svr1-profile1
svr2.mydom.com:
Package  This System  Other System  Difference
-------  -----------  ------------  ----------
zsh      4.3.10-9.el6 None          Only here
```

To compare the packages installed on this system with those installed on another system, use the `system_comparepackageprofile` command.

```
spacecmd {SSM:0}> spacecmd {SSM:0}> system_comparepackages svr1.mydom.com svr2.mydom.com
svr2.mydom.com:
Package  This System      Other System  Difference
-------  -----------      ------------  ----------
ypbind   1.20.4-30.el6:3  None          Only here
zsh      None             4.3.10-9.el6  Only there
```

To display the details of an installable package, use the `package_details` command.

```
spacecmd {SSM:0}> package_details zsh
...
Name:    zsh
Version: 4.3.10
Release: 9.el6
Epoch:
Arch:    x86_64

File:    zsh-4.3.10-9.el6.x86_64.rpm
Path:    redhat/1/f5a/zsh/4.3.10-9.el6/x86_64/f5a...59c/zsh-4.3.10-9.el6.x86_64.rpm
Size:    2238632
MD5:     None

Installed Systems: 1

Description
-----------
The zsh shell is a command interpreter usable as an interactive login
```

```
shell and as a shell script command processor.  Zsh resembles the ksh
shell (the Korn shell), but includes many enhancements.  Zsh supports
command line editing, built-in spelling correction, programmable
command completion, shell functions (with autoloading), a history
mechanism, and more.

Available From Channels
-----------------------
oraclelinux6-x86_64
...
```

To install a package on a system, use the `system_installpackage` command.

```
spacecmd {SSM:0}> system_installpackage svr1.mydom.com zsh
svr1.mydom.com:
** Generating package cache **
zsh-4.3.10-9.el6.x86_64

Install these packages [y/N]: y
INFO: Scheduled 1 system(s)
spacecmd {SSM:0}> schedule_list
ID      Date                 C    F    P     Action
--      ----                ---  ---  ---    ------
401     20150618T15:22:51     0    0    1    Package Install
...
spacecmd {SSM:0}> schedule_details 401
ID:        401
Action:    Package Install
User:      swadmin
Date:      20150618T15:22:51

Completed:   0
Failed:      0
Pending:     1

Pending Systems
---------------
svr1.mydom.com
```

To list the package upgrades that are available for a system, use the `system_listupgrades` command.

```
spacecmd {SSM:0}> system_listupgrades svr1.mydom.com
bash-4.1.2-29.el6.0.1.x86_64
wget-1.12-5.el6_6.1.x86_64
```

To upgrade the packages on a system, use the `system_upgradepackage` command.

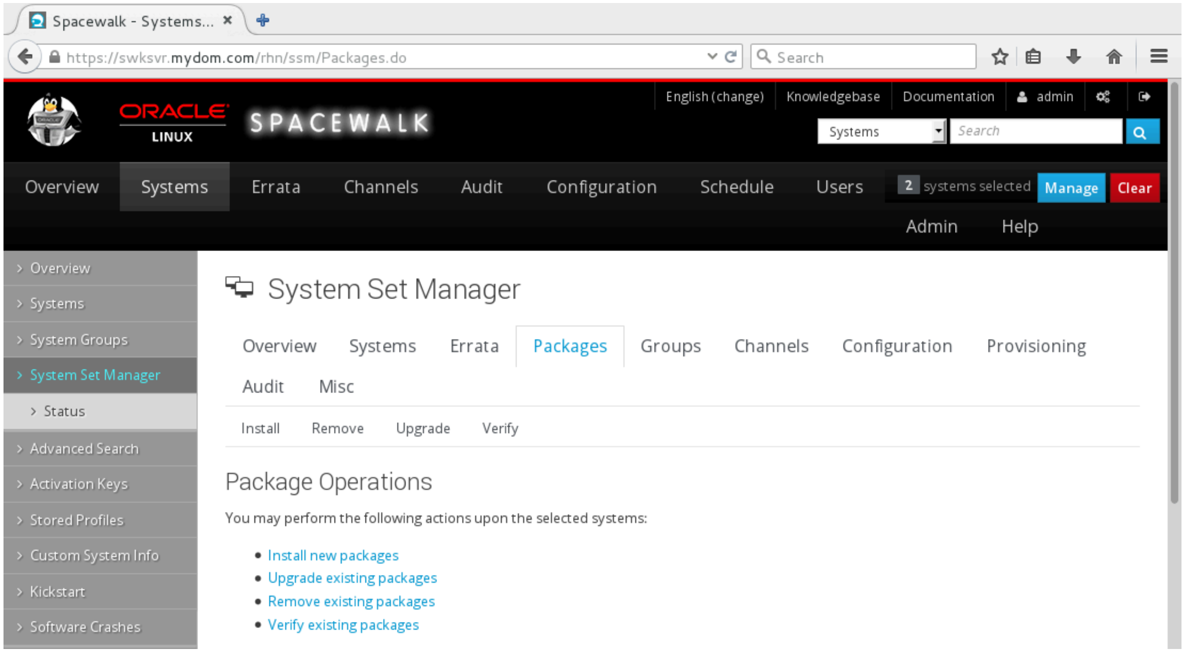
```
spacecmd {SSM:0}> system_upgradepackage svr1.mydom.com *
svr1.mydom.com:
bash-4.1.2-29.el6.0.1.x86_64
wget-1.12-5.el6_6.1.x86_64

Install these packages [y/N]: y
INFO: Scheduled 1 system(s)
```

To remove a package from a system, use the `system_removepackage` command.

```
spacecmd {SSM:0}> system_removepackage svr1.mydom.com busybox*
svr1.mydom.com:
busybox-1.15.1-20.el6:1.x86_64

Remove these packages [y/N]: y
INFO: Action ID: 403
INFO: Scheduled 1 system(s)
```

9.7 Managing Packages for System Groups Using the Spacewalk Web Interface

Figure 9.4 Package Operations Page



Package Operations

You may perform the following actions upon the selected systems:

- Install new packages
- Upgrade existing packages
- Remove existing packages
- Verify existing packages

To manage packages for system groups:

1. Go to **System Groups** and click the system group name.
2. On the **Details** page, click **work with group**.

   Spacewalk loads the group into the System Set Manager.
3. In the System Set Manager, select the **Packages** tab.
4. On the Package Operations page, select the tab or link for the package operation that you want to perform:

   Install

   a. On the Select Channel page, select the channel that contains the packages that you want to install on the systems in the system group.

   b. On the Select Packages to Install page, select the packages that you want to install and click **Install Selected Packages**.

   > **Tip**
   >
   > Use the package filter to locate a package.

   To see more information about a package, click its name.

   The Details page for the package lists any errata that include the package. To find out more information about an erratum, click its name.

The Details page for the erratum lists the CVEs that the erratum fixes. To find out more information about a CVE, click its name.

c. On the Confirm Package Install page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually installs the packages immediately.

   The Tasks Log page in the System Set Manager shows the status of the package installations.

Remove

a. On the Package Removal page, select the packages that you want to remove and click **Remove Selected Packages**.

b. On the Confirm Package Removal page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually removes the packages immediately.

   The Tasks Log page in the System Set Manager shows the status of the package removals.

Upgrade

a. On the Select Packages to Upgrade page, select the packages that you want to upgrade and click **Upgrade Selected Packages**.

b. On the Confirm Package Upgrade page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually upgrades the packages immediately.

   The Tasks Log page in the System Set Manager shows the status of the package upgrades.

Verify

a. On the Verifiable Packages page, select the packages that you want to verify and click **Verify Selected Packages**.

b. On the Confirm Package Verification page, change the schedule if required, and click **Confirm**.

   The page updates to include a link to the scheduled action.

   If you have not edited the schedule and you have enabled the OSA daemon on the clients, the OSA daemon usually verifies the packages immediately.

   The Tasks Log page in the System Set Manager shows the status of the package verifications.

9.8 Managing Packages for System Groups Using spacecmd

To compare the packages installed on the systems in a system group with a stored package profile, use the `system_comparepackageprofile` command.

```
spacecmd {SSM:0}> spacecmd {SSM:0}> system_comparepackageprofile group:group1 svr1-profile1
svr3.mydom.com:
Package  This System  Other System  Difference
-------  -----------  ------------  ----------
zsh      None         4.3.10-9.el6  Only there

##############################

svr4.mydom.com:
Package  This System  Other System  Difference
-------  -----------  ------------  ----------
zsh      None         4.3.10-9.el6  Only there
```

To install a package on the systems in a system group, use the `system_installpackage` command.

```
spacecmd {SSM:0}> system_installpackage group:group1 zsh
svr3.mydom.com:
zsh-4.3.10-9.el6.x86_64

##############################

svr4.mydom.com:
zsh-4.3.10-9.el6.x86_64

Install these packages [y/N]: y
INFO: Scheduled 2 system(s)
```

To list the package upgrades that are available for the systems in a system group, use the `system_listupgrades` command.

```
spacecmd {SSM:0}> system_listupgrades group:group1
svr3.mydom.com:
bash-4.1.2-29.el6.0.1.x86_64
wget-1.12-5.el6_6.1.x86_64

##############################

svr4.mydom.com:
wget-1.12-5.el6_6.1.x86_64
```

To upgrade the packages on the systems in a system group, use the `system_upgradepackage` command.

```
spacecmd {SSM:0}> system_upgradepackage group:group1 *
```

```
svr3.mydom.com:
bash-4.1.2-29.el6.0.1.x86_64
wget-1.12-5.el6_6.1.x86_64

##############################

svr4.mydom.com:
wget-1.12-5.el6_6.1.x86_64

Install these packages [y/N]: y
INFO: Scheduled 2 system(s)
```

To remove a package from the systems in a system group, use the `system_removepackage` command.

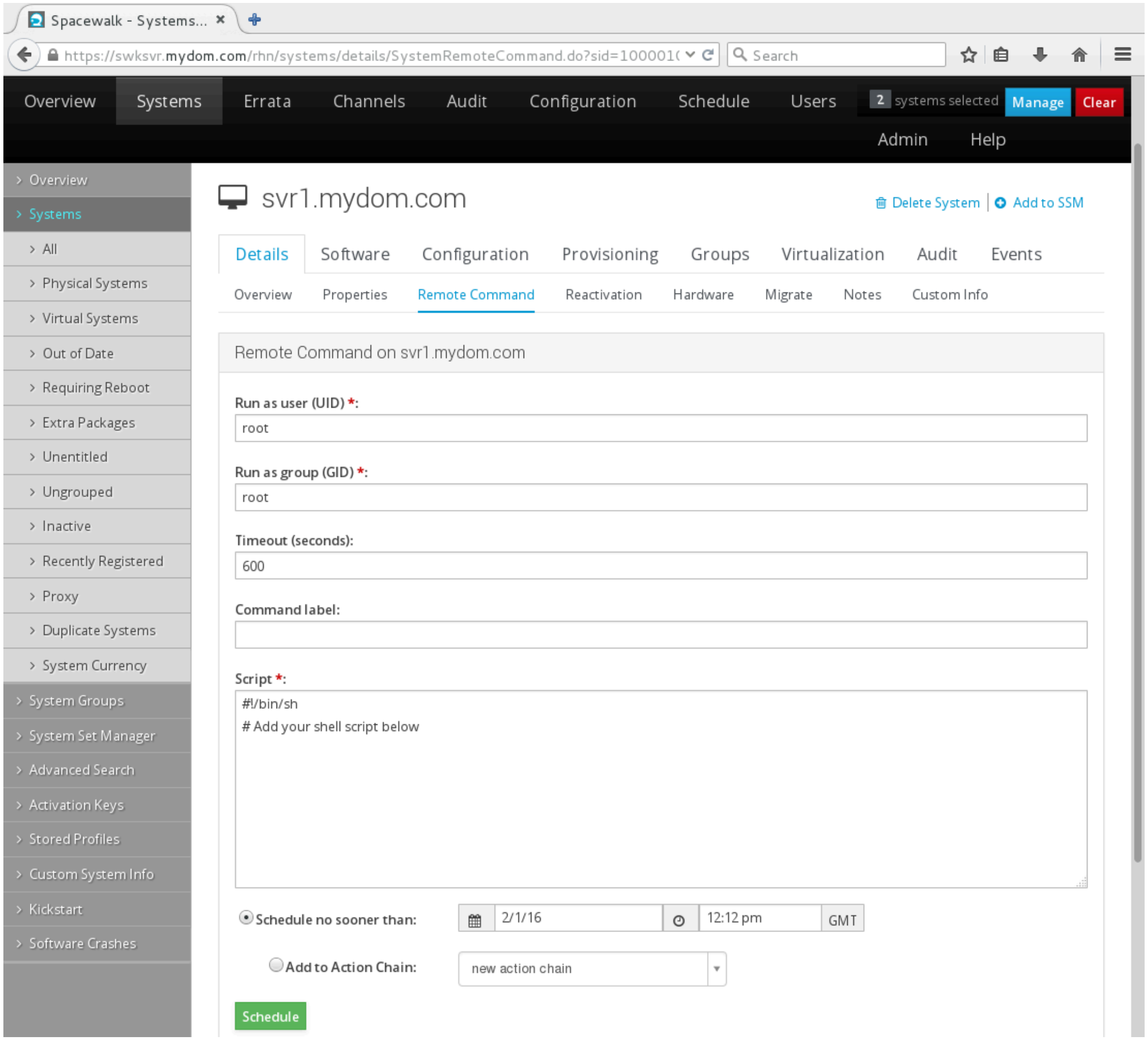
```
spacecmd {SSM:0}> system_removepackage svr1.mydom.com busybox*
svr3.mydom.com:
busybox-1.15.1-20.el6:1.x86_64

##############################

svr4.mydom.com:
busybox-1.15.1-20.el6:1.x86_64

Remove these packages [y/N]: y
INFO: Action ID: 407
INFO: Action ID: 408
INFO: Scheduled 2 system(s)
```

Chapter 10 Controlling and Configuring Client Systems

You can use the Spacewalk web interface or `spacecmd` to run command scripts on remote client systems. You can also set up configuration channels, subscribe client systems to these channels, and customize the client systems by using the channels to deploy configuration files.

10.1 Running Command Scripts on Remote Client Systems Using the Spacewalk Web Interface

Figure 10.1 Remote Command Page



Remote Command on svr1.mydom.com

Run as user (UID) *: root

Run as group (GID) *: root

Timeout (seconds): 600

Command label:

Script *:

```
#!/bin/sh
# Add your shell script below
```

● Schedule no sooner than: 2/1/16 12:12 pm GMT

○ Add to Action Chain: new action chain

Note

The client system must permit the Spacewalk server to run remote commands. See Section 6.4, “Enabling Remote Configuration in a Kickstart Profile Using the Spacewalk Web Interface” and Section 6.6, “Enabling Remote Configuration Manually for Non-managed Client Systems”.

To run a command on a remote client:

1. Go to **Systems** and select the client system from the list.

2. Select **Details** and then select the **Remote Command** tab.

3. If required, change the user and group ID of the user that should run the command, the command timeout, and a command label of up to 10 characters.

4. In the **Script** text box, enter the command script that you want to run. The following example runs the `who` command:

   ```
   #!/bin/sh
   who
   ```

5. If required, change the schedule for the command.

6. Click **Schedule** to commit the command script to run according to the schedule that you specify.

   If you have not edited the schedule and you have enabled the OSA daemon on the client, the OSA daemon usually runs the command immediately.

7. Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details of the script and any output if it has already run on the client.

10.2 Running Command Scripts on Remote Client Systems Using spacecmd

> **Note**
>
> The client system must permit the Spacewalk server to run remote commands. See Section 6.4, “Enabling Remote Configuration in a Kickstart Profile Using the Spacewalk Web Interface” and Section 6.6, “Enabling Remote Configuration Manually for Non-managed Client Systems”.

To run a command on client systems, use the `system_runscript` command, for example:

```
spacecmd {SSM:0}> system_runscript group:group3 -s 20150617T0130 -t 60 -f /root/myscript

User:        root
Group:       root
Timeout:     60 seconds
Start Time: 20150617T01:30:00

Script Contents
---------------
#!/bin/sh
yum update

Systems
-------
svr2.mydom.com
svr3.mydom.com

Is this ok [y/N]: y
INFO: Action ID: 343
INFO: Scheduled: 2 system(s)
```

To specify the date and time when an event should start, use the format *YYYYMMDD*[*hhmm*] with the -s option. If you do not specify a start time, Spacewalk assumes 0000 (midnight).

The -t option defines a timeout for a client to confirm that it has run a command. After this time has elapsed, Spacewalk assumes that the command has failed.

10.3 Working with Scheduled Events

To display a list of completed, failed, and pending events, use the schedule_list command.

```
spacecmd {SSM:0}> schedule_list
ID      Date                 C    F    P     Action
--      ----                ---  ---  ---    ------
...
343     20150617T01:30:00     0    0    2    Run an arbitrary script
...
```

The C, F, and P columns show the number of systems on which the event has completed, failed, or is pending. To display only completed, failed, or pending events, use the schedule_listcompleted, schedule_listfailed, or schedule_listpending commands.

To display the details of a pending event, use the schedule_details command.

```
spacecmd {SSM:0}> schedule_details 343
ID:        343
Action:    Run an arbitrary script
User:      swadmin
Date:      20150617T01:30:00

Completed:   0
Failed:      0
Pending:     2

Pending Systems
---------------
svr2.mydom.com
svr3.mydom.com
```

To cancel a pending event, use the schedule_cancel command.

```
spacecmd {SSM:0}> schedule_cancel 343
INFO: Canceled action 343
Canceled 1 action(s)
```

To re-run a failed event, use the schedule_reschedule command.

```
spacecmd {SSM:0}> schedule_reschedule 382
Rescheduled 1 action(s)
```

10.4 Working with Configuration Channels

Note

The client system must permit the Spacewalk server to deploy files, the activation key for the system must permit the provisioning add-on entitlement and configuration file deployment, and the provisioning entitlement must be enabled for the system. See Section 6.4, “Enabling Remote Configuration in a Kickstart Profile Using the Spacewalk Web Interface”, Section 6.6, “Enabling Remote Configuration

> Manually for Non-managed Client Systems", and Chapter 3, *Creating Activation Keys*.

In the same way that a software channel in Spacewalk contains packages for installation on multiple client systems, a configuration channel contains files for configuring client systems. For example, the files might contain configuration information for services, applications, or users.

10.4.1 Using Custom Information Keys

Custom information keys allow you to extract configuration information from clients.

To use a custom information key:

1. Define the custom information key in Spacewalk as described in Section 10.4.2, "Defining Custom Information Keys Using the Spacewalk Web Interface" and Section 10.4.3, "Defining Custom Information Keys Using spacecmd".

   For example, you could define a custom information key named `uptrack-uname` to store the value of the Ksplice effective kernel version.

2. Install the `rhn-custom-info` package on each client with which you want to use the key.

3. Use the `rhn-custom-info` command to make the value of the key available in Spacewalk. For example:

   ```
   # rhn-custom-info uptrack-uname `uptrack-uname -r`
   ```

   This command makes the value returned by `uptrack-uname -r` available as the value of the `uptrack-uname` key. You can then use the macro `rhn.system.custom_info(uptrack-uname)` to extract the value of `uptrack-name` within a configuration file.

10.4.2 Defining Custom Information Keys Using the Spacewalk Web Interface

To define a custom information key and assign it to a system:

1. Go to **Systems** and select **Custom System Info**.

2. Click **+ create new key**.

3. On the Create Custom Info Key page, enter a key label (for example, `asset_tag`) and description, and then click **Create Key**.

4. Go to **Systems** and click the name of the system for which you want to assign a value to the key.

5. Select the **Custom Info** tab.

6. On the Custom System Information page, click **+ create new value**.

7. On the Edit Custom Info Key page, select the key to which you want to assign a value.

   The page updates to display information about the key and a **Value** text box.

8. Enter the key value in the **Value** text box and click **Update Key**.

   The Custom System Information page displays the key-value pairs that are associated with a system. You can modify a value by selecting the associated **Edit this value** link.

Note

You can also define custom information keys for a system by using the **Custom Info** tab of a system's kickstart profile.

You can define as many key-value pairs for a system as you require.

10.4.3 Defining Custom Information Keys Using spacecmd

To create a custom information key, use the `custominfo_createkey` command.

```
spacecmd {SSM:0}> custominfo_createkey admin_user "Email of admin contact"
```

To list the available custom information keys, use the `custominfo_listkeys` command.

```
spacecmd {SSM:0}> custominfo_listkeys
asset_tag
admin_user
```

To assign a custom information key to a system or system group, use the `system_addcustomvalue`.

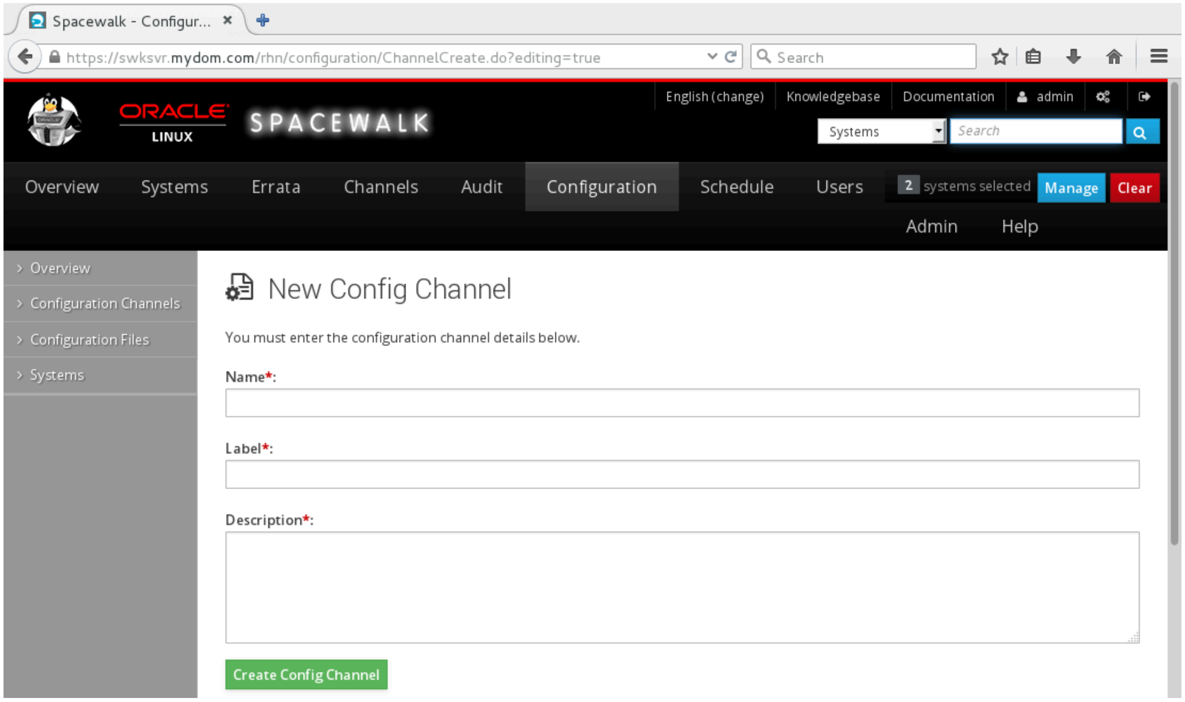
```
spacecmd {SSM:0}> system_addcustomvalue asset_tag "fc01568a" svr3.mydom.com
spacecmd {SSM:0}> system_addcustomvalue admin_user "an.admin@mydom.com" group:group3
```

To list the custom information keys for a system or system group, use the `system_listcustomvalues` command.

```
spacecmd {SSM:0}> system_listcustomvalues svr3.mydom.com
asset_tag = fc01568a
admin_user = an.admin@mydom.com
spacecmd {SSM:0}> system_listcustomvalues group:group3
System: svr3.mydom.com

asset_tag = fc01568a
admin_user = an.admin@mydom.com

##############################

System: svr4.mydom.com

asset_tag = aa10889f
admin_user = an.admin@mydom.com
```

10.4.4 Working with Configuration Channels Using the Spacewalk Web Interface

Figure 10.2 New Config Channel Page



New Config Channel

You must enter the configuration channel details below.

Name*:

Label*:

Description*:

To create a configuration channel:

1. Go to **Configuration** and select **Configuration Channels**
2. On the Centrally Managed Configuration Channels page, click **+ create new config channel**.
3. Enter a name, label, and description for the channel. The label should be a short representation of the target operating system, architecture (if appropriate), and the purpose of the channel. For example: `ol6_generic_configuration`.
4. Click **Create Config Channel**.
5. To add files to the configuration channel, on the New Channel page, select the **Add Files** tab.

   - To create a text file, directory, or symbolic link:

     a. Select the **Create File** tab.

     b. On the Create New Configuration File page, you can create a text file, directory, or symbolic link.

        For example, to set up a message-of-the-day file that contains configuration information about the client, you might enter the following details:

File Type	Select **Text file**.
Filename/Path	Enter `/etc/motd`.

Ownership Enter root for both the user name and group. (These are the default entries.)

File Permissions Mode Enter 644. (This is the default mode.)

File Contents Select the file type as **Shell** from the drop-down list, and enter the file contents in the text field.

For example, the following file uses macros that Spacewalk replaces with the appropriate values for the system on which the file is deployed:

```
System Information
==================
Client system: {|rhn.system.hostname|}
Spacewalk SID: {|rhn.system.sid|}
Asset tag:     {|rhn.system.custom_info(asset_tag) = 'Asset tag missing'|}
Profile:       {|rhn.system.profile_name|}
Description:   {|rhn.system.description|}
IP address:    {|rhn.system.ip_address(eth0)|}
MAC address:   {|rhn.system.net_interface.hardware_address(eth0)|}
```

The custom macro `rhn.system.custom_info` substitutes the value of the custom system information key named `asset_tag` as assigned on the Custom Info tab for the system. Otherwise, it inserts the value `Asset tag missing`.

See Section 10.4.2, “Defining Custom Information Keys Using the Spacewalk Web Interface”.

See Appendix C, *Configuration File Macros*.

c. After entering the details of the file, click **Create Configuration File**.

- To import files:

  a. Select the **Import Files** tab.

  On the Import Configuration File(s) from Another Channel page, you can import configuration files from other configuration channels.

  b. Select the check boxes of the configuration files that you want to import.

  c. Click **Import Configuration File(s)**.

- To upload files:

  a. Select the **Upload File** tab.

  b. On the Upload New Configuration File page, click **Browse...** and select the path of the file to upload.

  c. Select the file type: **Text file** or **Binary file**.

  d. Enter other details for the file, such as ownership and permissions, as required.

  e. Click **Upload Configuration File**.

10.4.5 Working with Configuration Channels Using spacecmd

To create a configuration channel, use the `configchannel_create` command.

```
spacecmd {SSM:0}> configchannel_create
Name: Oracle Linux 6 Server Configuration
Label: ol6-server-config
Description: Generic configuration channel for Oracle Linux 6 servers
```

To add a configuration file to a channel, use the `configchannel_addfile` command.

```
spacecmd {SSM:0}> configchannel_addfile ol6-server-config
Path: /etc/motd
Symlink [y/N]: N
Directory [y/N]: N
Owner [root]: [Enter]
Group [root]: [Enter]
Mode [0644]: [Enter]
SELinux Context [None]: [Enter]
Revision [next]: [Enter]
Read an existing file [y/N]: y
File: /var/config_file_templates/ol6-server/etc/motd
Path:            /etc/motd
Directory:       False
Owner:           root
Group:           root
Mode:            0644
SELinux Context:

Contents
--------
System Information
==================
Client system: {|rhn.system.hostname|}
Spacewalk SID: {|rhn.system.sid|}
Asset tag:     {|rhn.system.custom_info(asset_tag) = 'Asset tag missing'|}
Profile:       {|rhn.system.profile_name|}
Description:   {|rhn.system.description|}
IP address:    {|rhn.system.ip_address(eth0)|}
MAC address:   {|rhn.system.net_interface.hardware_address(eth0)|}

Is this ok [y/N]: y
```

The custom macro `rhn.system.custom_info` substitutes the value of the custom system information key named `asset_tag` as assigned on the Custom Info tab for the system. Otherwise, it inserts the value `Asset tag missing`.

See Section 10.4.3, “Defining Custom Information Keys Using spacecmd”.

See Appendix C, *Configuration File Macros*.

To display the details of a configuration channel, use the `configchannel_details` command.

```
spacecmd {SSM:0}> configchannel_details ol6-server-config
Label:       ol6-server-config
Name:        Oracle Linux 6 Server Configuration
Description: Configuration channel for generic Oracle Linux 6 servers

Files
-----
/etc/motd
```

10.4.6 Subscribing Client Systems to Configuration Channels Using the Spacewalk Web Interface

To subscribe a client system to a configuration channel:

1. Go to **Systems** and click the system name.
2. Select the **Configuration** tab, then the **Manage Configuration Channels** tab, and finally the **Subscribe to Channels** tab.
3. On the Step 1: Select Channels for Subscription page, select the check boxes for the channels to which you want to subscribe the system and click **Continue**.
4. On the Step 2: Rank Channels for Subscription page, you can optionally change the order of the configuration channels according to priority. Higher-rank entries override lower-rank entries if several entries can modify the same files or directories.
5. To save your changes, click **Update Channel Rankings**.

See Section 10.4.8, “Deploying Configuration Files to Client Systems Using the Spacewalk Web Interface”.

10.4.7 Subscribing Client Systems to Configuration Channels Using spacecmd

To list the available configuration channels, use the `configchannel_list` command.

```
spacecmd {SSM:0}> configchannel_list
ol6-dns-server-config
ol6-http-server-config
ol6-nfs-server-config
ol6-server-config
```

To subscribe a system or system group to a configuration channel, use the `system_addconfigchannels` command.

```
spacecmd {SSM:0}> system_addconfigchannels svr3.mydom.com ol6-nfs-server-config -t
spacecmd {SSM:0}> system_addconfigchannels group:group3 ol6-server-config -b
```

To list the configuration channels to which a system or system group is subscribed, use the `system_listconfigchannels` command.

```
spacecmd {SSM:0}> system_listconfigchannels group:group3
System: svr3.mydom.com
ol6-nfs-server-config
ol6-server-config

##############################

System: svr4.mydom.com
ol6-server-config
```

To edit the configuration channels for a system, you can use the `system_setconfigchannelorder` command.

```
spacecmd {SSM:0}> system_setconfigchannelorder svr1.mydom.com
Current Selections
```

```
------------------
1. ol6-server-config

a[dd], r[emove], c[lear], d[one]: a

Available Configuration Channels
--------------------------------
ol6-dns-server-config
ol6-http-server-config
ol6-nfs-server-config
ol6-server-config

Channel: ol6-dns-server-config
New Rank: 1

Current Selections
------------------
1. ol6-dns-server-config
2. ol6-server-config

a[dd], r[emove], c[lear], d[one]: d
```

To unsubscribe a system from a configuration channel, use the `system_removeconfigchannels` command.

```
spacecmd {SSM:0}> system_removeconfigchannels svr3.mydom.com ol6-server-config
```

10.4.8 Deploying Configuration Files to Client Systems Using the Spacewalk Web Interface

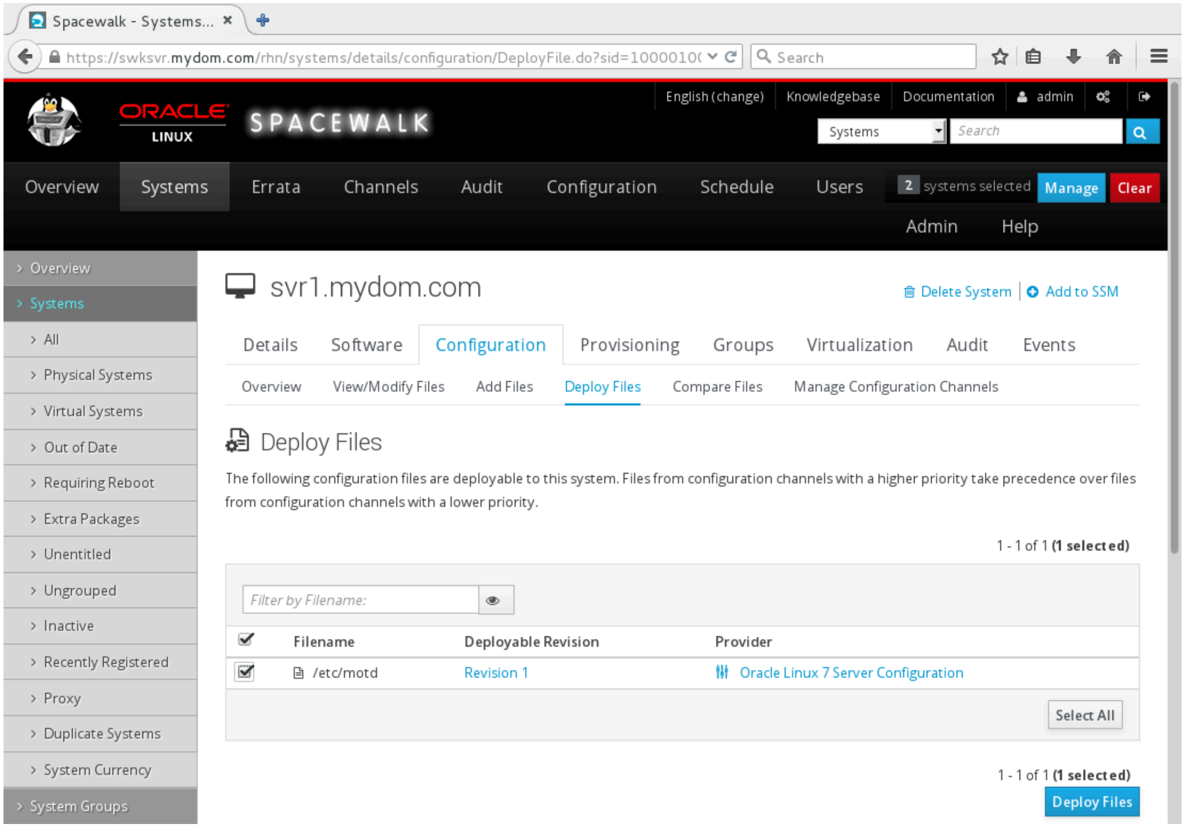
Note

You must have previously subscribed the system to the appropriate configuration channel for the configuration files that you want to deploy. See Section 10.4.6, “Subscribing Client Systems to Configuration Channels Using the Spacewalk Web Interface”.

The first deployment to a client system can fail if the `/var/log/rhncfg-actions` log file does not exist on the client. If the deployment fails, the log file is created automatically, and you can reschedule the deployment event. Alternatively, run the command `touch /var/log/rhncfg-actions` on the client system before deploying any files to it.

Oracle recommends using configuration files to deploy SSL and GPG certificates to Spacewalk clients that were not previously provisioned by the Spacewalk server.

Figure 10.3 Deploy Files Page



The following configuration files are deployable to this system. Files from configuration channels with a higher priority take precedence over files from configuration channels with a lower priority.

☑	Filename	Deployable Revision	Provider
☑	/etc/motd	Revision 1	Oracle Linux 7 Server Configuration

To deploy a configuration file to a client system:

1. Go to **Systems** and click the system name.

2. Select the **Configuration** tab and then the **Deploy Files** tab.

3. On the Deploy Files page, select the check boxes for the files that you want to deploy, and click **Deploy Files**.

4. On the Confirm Deploy Files page, change the schedule if required, and click **Schedule Deploy**.

5. Select **Events** and then select the **Pending** or **History** tab to view scheduled or completed actions. Click the summary name to display the details of the deployment event.

10.4.9 Deploying Configuration Files to Client Systems Using spacecmd

Note

You must have previously subscribed the system to the appropriate configuration channel for the configuration files that you want to deploy. See Section 10.4.7, “Subscribing Client Systems to Configuration Channels Using spacecmd”.

The first deployment to a client system can fail if the `/var/log/rhncfg-actions` log file does not exist on the client. If the deployment fails, the log file is created automatically, and you can reschedule the deployment event. Alternatively, run

> the command `touch /var/log/rhncfg-actions` on the client system before deploying any files to it.

To deploy all configuration files to a system or system group, use the `system_deployconfigfiles` command.

```
spacecmd {SSM:0}> system_deployconfigfiles group:group3
Systems
-------
svr3.mydom.com
svr4.mydom.com

Deploy ALL configuration files to these systems [y/N]: y
INFO: Scheduled deployment for 2 system(s)
```

To display the details of a pending deployment event, use the `schedule_details` command. See Section 10.3, “Working with Scheduled Events”.

Chapter 11 Performing OpenSCAP Auditing of Client Systems

Note

The client system must permit the Spacewalk server to run remote commands. See Section 6.4, “Enabling Remote Configuration in a Kickstart Profile Using the Spacewalk Web Interface” and Section 6.6, “Enabling Remote Configuration Manually for Non-managed Client Systems”.

To be able to run OpenSCAP scans on a client system, install the `spacewalk-oscap` package on that system.

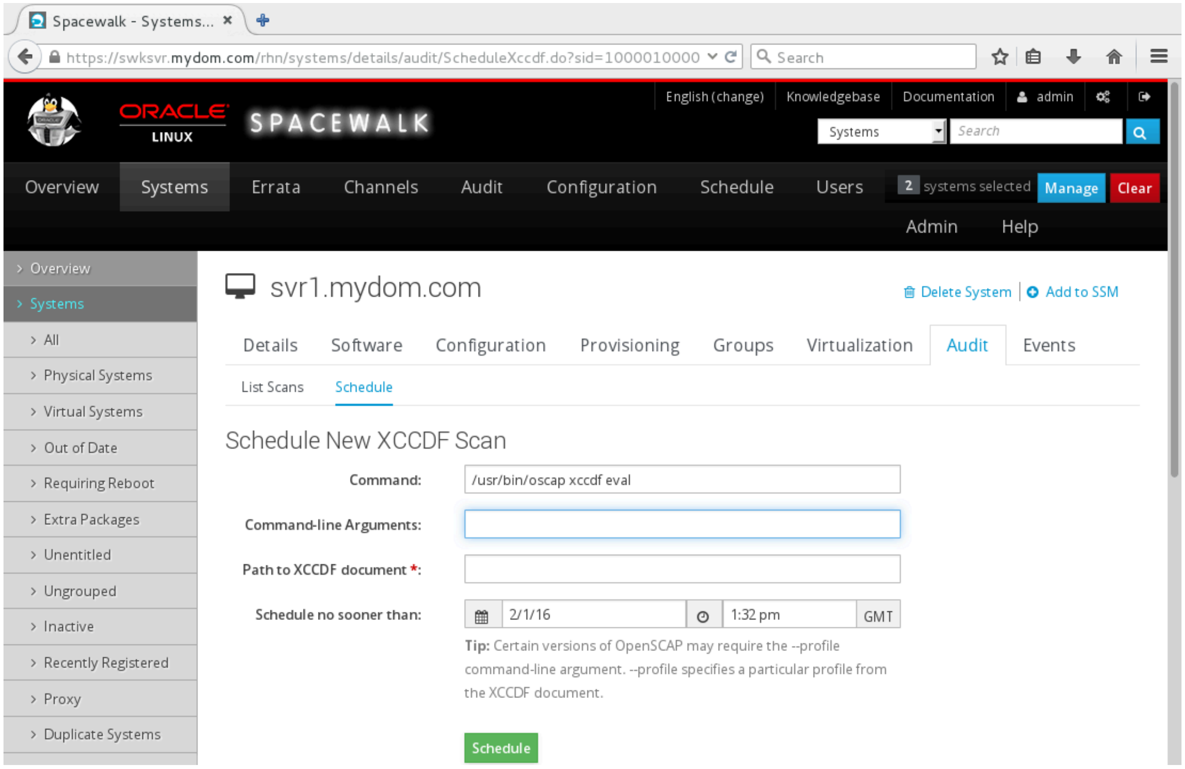
You can use the OpenSCAP tools to audit Spacewalk clients. You can use the SCAP Security Guide, which is provided with Oracle Linux 6 and Oracle Linux 7, or any OpenSCAP compliant eXtensible Configuration Checklist Description Format (XCCDF) or Open Vulnerability and Assessment Language (OVAL) files. The `scap-security-guide` package, which is available for Oracle Linux 6 and Oracle Linux 7, provides SCAP Security Guides that have been updated to include Common Platform Enumeration (CPE) definitions for Oracle Linux.

For more information about using OpenSCAP compliance checking with Oracle Linux, see Running OpenSCAP Compliance Checks on Oracle Linux.

11.1 Performing OpenSCAP Auditing of Client Systems Using the Spacewalk Web Interface

Note

Typically, you would use the `oscap` command with Spacewalk to perform scans. See *Oracle® Linux 6: Security Guide* and *Oracle® Linux 7: Security Guide* for more information about using this command.



Command: /usr/bin/oscap xccdf eval

Command-line Arguments:

Path to XCCDF document *:

Schedule no sooner than: 2/1/16 1:32 pm GMT

Tip: Certain versions of OpenSCAP may require the --profile command-line argument. --profile specifies a particular profile from the XCCDF document.

Figure 11.1 Schedule New XCCDF Scan Page

To schedule a scan for a system or system group:

1. For a system:

   - Go to **Systems**, click the system name, select the **Audit** tab, and then select the **Schedule** tab.

   For a system group:

   a. Go to **Systems** and select **System Groups**.

   b. Click the system group name.

   c. On the Details page, click **work with group**.

      Spacewalk loads the group into the System Set Manager.

   d. Select the **Audit** tab.

2. On the Schedule New XCCDF Scan page, enter the scan settings in the following fields:

   Command

   Enter the command to use for the scan. The default command is `/usr/bin/oscap xccdf eval`, which scans a system against a profile in an installed XCCDF checklist file.

   To run an OVAL auditing scan, use the command `/usr/bin/oscap oval eval`. You can download OVAL definition files from https://linux.oracle.com/security.

Command-line arguments

Enter any command-line arguments to the command that you are using to perform the scan. For example: `--profile server`.

Path to XCCDF document

Enter the path of the XCCDF checklist file, for example `/usr/share/xml/scap/ssg/content/ssg-rhel6-xccdf.xml`, or downloaded OVAL definition file, for example `com.oracle.elsa-2014.xml`.

3. Change the schedule if required, and click **Schedule**.

   When the scan is complete, a summary of the results of the scan are displayed under the **List Scans** tab. Oracle recommends that you schedule regular scans to check for security regressions.

11.2 Performing OpenSCAP Auditing of Client Systems Using spacecmd

> **Note**
>
> `spacecmd` supports XCCDF scans but not OVAL scans. Instead, you can use Spacewalk's remote command execution facility to run `oscap oval eval` on Spacewalk clients. See *Oracle® Linux 6: Security Guide* and *Oracle® Linux 7: Security Guide* for more information about using the `oscap` command.

To schedule an XCCDF scan for systems, use the `scap_schedulexccdfscan` command.

```
spacecmd {SSM:0}> scap_schedulexccdfscan '/usr/share/xml/scap/ssg/content/ssg-rhel6-xccdf.xml' \
'profile server' svr1.mydom.com
```

To list scheduled auditing scans, use the `schedule_list` command. See Section 10.3, “Working with Scheduled Events”.

```
spacecmd {SSM:0}> schedule_list
ID      Date                 C    F    P     Action
--      ----                ---  ---  ---    ------
522     20150625T12:56:01     0    0    1    OpenSCAP xccdf scanning
...
```

To list the summary results of completed XCCDF scans, use the `scap_listxccdfscans` command:

```
spacecmd {SSM:0}> scap_listxccdfscans svr1.mydom.com
```

To list the details and results of an XCCDF scan, specified by its scan ID, use the `scap_getxccdfscandetails` and `scap_getxccdfscanruleresults` commands.

```
spacecmd {SSM:0}> scap_getxccdfscandetails scan_ID
spacecmd {SSM:0}> scap_getxccdfscanruleresults scan_ID
```

Chapter 12 Configuring Ksplice Offline Client for Client Systems

On average, the Linux kernel receives security updates and bug fixes about once per month. Traditionally, applying such updates would require you to obtain and install the updated kernel RPMs, to schedule downtime, and to reboot the server into the new kernel with the critical updates. As system setups become more complex with many interdependencies, and access to services and applications must remain as undisrupted as possible, scheduling such reboots becomes more difficult and costly.

Oracle Ksplice allows you to keep your systems secure and highly available by allowing you to update your systems with the latest kernel security errata and other critical updates. Oracle Ksplice updates the running kernel image without requiring a reboot. Your systems remain up to date with their OS vulnerability patches and downtime is minimized. A Ksplice update takes effect immediately it is applied. It is not an on-disk change that only takes effect after a subsequent reboot.

Oracle creates each Ksplice update from a kernel update that originates either from Oracle or from the Linux kernel community.

Ksplice Offline Client removes the requirement for a server on your intranet to have a direct connection to the Oracle Uptrack server. All available Ksplice updates for each supported kernel version are bundled into an RPM that is specific to that version, and this package is updated every time that a new Ksplice patch becomes available for the kernel.

Note

Ksplice Offline Client is freely available for Oracle Linux customers that subscribe to Oracle Linux Premier Support. If you are an Oracle Linux Basic, Basic Limited, or Network Support subscriber, contact your sales representatives to discuss a potential upgrade of your subscription to a Premier Support plan.

You can configure a Spacewalk server as a mirror of the Ksplice for Oracle Linux channels on ULN. The Spacewalk server does not require access to the Oracle Uptrack server. Instead, you schedule Spacewalk to download the latest Ksplice update packages to a software channel. After installing Ksplice Offline Client on your Spacewalk client systems, they can install the Ksplice update packages from the Spacewalk server. The clients also do not require access the Oracle Uptrack server.

Note

You cannot use the web interface or the Ksplice Uptrack API to monitor systems that are running Ksplice Offline Client as such systems are not registered with https://uptrack.ksplice.com.

12.1 Supported Kernels

You can use Ksplice Uptrack to bring the following Oracle Linux kernels up to date with the latest important security and bug fix patches:

- All Oracle Linux 6 and Oracle Linux 7 kernels starting with the official release.
- All Oracle Unbreakable Enterprise Kernel versions for Oracle Linux 5 and Oracle Linux 6 starting with 2.6.32-100.28.9 (released March 16, 2011).
- All Oracle Linux 5 Red Hat Compatible Kernels starting with Oracle Linux 5.4 (2.6.18-164.el5, released September 9, 2009).

- All Oracle Linux 5 Red Hat Compatible Kernels with bug fixes added by Oracle starting with Oracle Linux 5.6 (2.6.18-238.0.0.0.1.el5, released January 22, 2011).

To confirm whether a particular kernel is supported, install the Uptrack client on a system that is running the kernel.

If you have a question about supported kernels, send e-mail to ksplice-support_ww@oracle.com.

12.2 Configuring a Spacewalk Server to Act as a Ksplice Mirror

To configure a Spacewalk server to act as a Ksplice mirror, configure repositories and associated software channels for the Oracle Linux releases and architectures of the clients on which you want to run Ksplice Offline Client. Each Ksplice channel should be a child of the appropriate base software channel. See Section 2.4, “Working with Repositories” and Section 2.5, “Working with Software Channels”.

The following table shows the channels that are available for Ksplice on Oracle Linux.

Channel Name	Channel Label	Description
Ksplice for Oracle Linux 5 (i386)	`ol5_i386_ksplice`	Oracle Ksplice clients, updates, and dependencies for Oracle Linux 5 on i386 systems.
Ksplice for Oracle Linux 5 (x86_64)	`ol5_x86_64_ksplice`	Oracle Ksplice clients, updates, and dependencies for Oracle Linux 5 on x86-64 systems.
Ksplice for Oracle Linux 6 (i386)	`ol6_i386_ksplice`	Oracle Ksplice clients, updates, and dependencies for Oracle Linux 6 on i386 systems.
Ksplice for Oracle Linux 6 (x86_64)	`ol6_x86_64_ksplice`	Oracle Ksplice clients, updates, and dependencies for Oracle Linux 6 on x86-64 systems.
Ksplice for Oracle Linux 7 (x86_64)	`ol7_x86_64_ksplice`	Oracle Ksplice clients, updates, and dependencies for Oracle Linux 7 on x86_64 systems.

For example, you would specify the URL of the Ksplice for Oracle Linux 6 (x86_64) channel on ULN as:

```
uln:///ol6_x86_64_ksplice
```

12.3 Provisioning Client Systems as Ksplice Offline Clients

To provision a client system as a Ksplice offline client, configure its kickstart profile as follows:

- Under **Kickstart Details**, select the **Operating System** tab, ensure that the check box for the Ksplice child software channel is checked, and click **Update Kickstart**.
- Under **Software**, include `uptrack-offline` in the list of packages to install.
- Under **Scripts**, create a post-installation, `nochroot` shell script that installs the Ksplice update packages.

  For Oracle Linux 6 or Oracle Linux 7:

  ```
  yum install uptrack-updates-`uname -r`
  ```

  For Oracle Linux 5:

  ```
  yum install uptrack-updates-`uname -r`.`uname -m`
  ```

Install new Ksplice updates as they become available. You can schedule Spacewalk to update the client system or you can set up an `anacron` script on the client itself. For example, you could use the following script with an Oracle Linux 6 or Oracle Linux 7 client:

```
#!/bin/sh
yum install uptrack-updates-`uname -r`
```

The script must be executable and be owned by `root`. If you place the script in `/etc/cron.daily` on the client, it runs once every day.

12.4 Configuring Existing Client Systems as Ksplice Offline Clients

Once you have set up a local ULN mirror that can act as a Ksplice mirror, you can configure your other systems to receive `yum` and Ksplice updates.

To configure a system as a Ksplice offline client:

1. Subscribe the client system to the Ksplice software channel that corresponds to the Oracle Linux release and architecture.

2. Install the Ksplice offline client package (`uptrack-offline`) on the system.

   You can run the `yum` command directly on the client system, for example:

   ```
   yum install uptrack-offline
   ```

   Alternatively, use the Spacewalk web interface or `spacecmd` to install the package or to run the `yum` command remotely.

3. Install the Ksplice updates that are available for the kernel.

   For an Oracle Linux 5 client, install the update packages. You can use the following `yum` command to install the update packages:

   ```
   # yum install uptrack-updates-`uname -r`.`uname -m`
   ```

   For an Oracle Linux 6 or Oracle Linux 7 client, install the update packages. You can use the following `yum` command to install the update packages:

   ```
   # yum install uptrack-updates-`uname -r`
   ```

   Install new Ksplice updates as they become available. You can schedule Spacewalk to update the client system or you can set up an `anacron` script on the client itself. For example, you could use the following script with an Oracle Linux 6 or Oracle Linux 7 client:

   ```
   #!/bin/sh
   yum install uptrack-updates-`uname -r`
   ```

   The script must be executable and be owned by `root`. If you place the script in `/etc/cron.daily` on the client, it runs once every day.

Appendix A Kickstart Options

Using the Spacewalk web interface, you can specify the following kickstart options for a kickstart profile:

auth

(Mandatory) Specifies whether the shadow password file is used and the password algorithm. The default setting is --enableshadow --passalgo=sha256, which enables the shadow password file and specifies SHA256 as the password algorithm. If you change the password algorithm, the password hash specified for rootpwd must have been generated by using the same algorithm or you will not be able to log in to the installed system.

See the authconfig(8) manual page for a list of the options that you can specify.

autopart

Specifies whether the installation should perform automatic partitioning. If you specify this option, you should also specify clearpart and zerombr. Use ignoredisk to specify the disks that the Installer should or should not use.

autostep

```
autostep [ --autoscreenshot ]
```

Specifies that the Installer should step through every screen.

bootloader

```
bootloader --location={mbr|none|partition}
         [ --append="boot-loader kernel parameters" ]
```

(Mandatory) Specifies whether the boot loader is installed in the MBR or in a disk partition. The default setting is --location mbr.

cdrom

Specifies that the installation is from the first CD-ROM drive on the system.

clearpart

```
clearpart [ --all [ --initlabel ] |
            --linux |
            --list=part1,... |
            --none ]
          [ --drives=drive1,... ]
          [ --initlabel ]
```

Specifies whether to clear any existing partitions. For example, --drives=sda --all --initlabel would clear all partitions on the disk device sda and reinitialize the disk lablel.

Caution

The default setting of --all clears all partitions on all attached disks.

cmdline

Specifies that the installation should be performed in non-interactive, command-line mode.

device

```
device {eth|scsi}module_name --opts="module options"
```

Specifies the module name and options for a system device.

deviceprobe

Specifies how to probe for devices.

`driverdisk`

```
driverdisk partition [ --type=fstype ]

driverdisk --source=ftp://image_path

driverdisk --source=http://server/image_path

driverdisk --source=nfs:server:image_path
```

Specifies a driver disk.

`firewall`

```
firewall { --disabled | --enabled } [ --ftp ] [ --http ]
         [ --port=inbound_port1:{tcp|udp},... ]
         [ --smtp ] [ --ssh ]
         [ --trust=network_interface ]...
```

Specifies the configuration of the system firewall. The default value is `--disabled`.

`firstboot`

```
firstboot { --enable | --disable | --reconfig }
```

Specifies how the setup agent starts when the system is first booted. If enabled, the `initial-setup` package must be installed.

`graphical`

Perform a graphical installation. It is not usual to select this option for non-interactive kickstart installations.

`halt`

Specifies that the Installer should halt the system after installation is complete and wait for a key to be pressed on the console before rebooting.

`harddrive`

```
harddrive [ --biospart=BIOS_partition | --partition=partition ]
          [ --dir=install_directory ]
```

Specifies an installation directory on a local hard drive.

`ignoredisk`

```
ignoredisk { --drives=[disk1,...] | --only-use=[disk1,...]
```

Specifies disks that the Installer should or should not use during installation.

`install`

Specifies that the Installer should perform a new installation. This option is specified by default.

`interactive`

Specifies that the installation should be interactive.

`iscsi`

```
iscsi --ipaddr=target_addr --target=target_IQN
    [ --iface=network_interface ] [ --port=target_port ]
    [ --user=target_username --password=target_password ]
    [ --reverse-username=initiator_username
      --reverse-password=initiator_password ]
```

Specifies iSCSI storage to be used during installation.

`iscsiname`

Specifies the iSCSI initiator name for the system.

`key`

Specifies an installation key for package selection and system identification.

`keyboard`

(Mandatory) Specifies the keyboard layout. The default setting is `us`.

`lang`

(Mandatory) Specifies the language to be used for installation and the default locale on the installed system. The default setting is `en_US`.

`logging`

```
logging [ --host=remote_host ]
        [ --level={critical|debug|error|info|warning} ]
        [ --port=remote_port ]
```

Configures installation error logging.

`monitor`

```
monitor [ --hsync=Hfreq ] [ --vsync=Vfreq ]
```

Specifies the monitor's horizontal and vertical synchronization frequency settings.

`mouse`

Deprecated. Do not use.

`multipath`

```
multipath --name=pathname --device=device --rule=rule
```

Specifies a multipath device.

`network`

```
network --bootproto=dhcp [ --device=interface ]
      [ --onboot={no|yes} ]

network --bootproto=static [ --device=network_interface ]
      [ --onboot={no|yes} ]
      [ --noipv4 | --ip=IP_addr --netmask=netmask ]
      [ --noipv6 | --ipv6={auto|dhcp|IPv6_addr/prefix} ]
      [ --gateway=gateway_addr ]
      [ --nameserver=namesvr_addr ]
```

Specifies the configuration of the network interfaces. The default setting is `--bootproto dhcp`, which configures the network interface used for installation to use DHCP to obtain its network settings.

`nfs`

```
nfs --server=NFSserver --dir=install_directory
  [ --opts=mount_options ]
```

Specifies an NFS server and directory path to use for installation.

`poweroff`

Specifies that the Installer should power down the system after installation is complete.

`reboot`

Specifies that the Installer should reboot the system after installation is complete. This option is specified by default. For unattended installations, the `poweroff` option might be preferable.

`rootpw`

```
rootpw { --iscrypted | --plaintext } password
```

(Mandatory) Specifies the root password as a hash value or in plain text. This option is specified by default. If you specify a plain text password, select the **Encrypt** check box.

`selinux`

```
selinux { --disabled | --enforcing | --permissive }
```

Specifies the SELinux mode as disabled, enforcing, or permissive. The default setting is `--permissive`.

`services`

```
services [ --disabled=service1,... ]
```

```
         [ --enabled=serviceA,... ]
```

Specifies which services to disable or enable at the default run level.

`shutdown`

Specifies that the Installer should shut down the system after installation is complete but not power it down.

`skipx`

Do not install X on the system. This option is specified by default.

`text`

Perform a text-only installation. This option is specified by default as kickstart installations are usually non-interactive.

`timezone`

```
timezome [ --utc ] timezone
```

(Mandatory) Specifies the time zone and whether the hardware clock uses UTC (`--utc`). The default setting is `America/New_York`.

`upgrade`

Specifies that the Installer should perform an upgrade installation.

`url`

```
url --url={file_path |
           ftp://username:password@server/path |
           http://server/path}
```

Specifies the URL of the kickstart file. By default, the kickstart URL is specified as a file path and Spacewalk writes the correct, full URL to the kickstart file, depending on whether the system being installed connects directly to a Spacewalk server or via a Spacewalk proxy. If you enter a full URL instead of a file path, Spacewalk does not modify the URL.

`user`

```
user --name=username [ --groups=group1,... ]
  [ --homedir=directory ]
  [ --password=password ] [ --iscrypted ]
  [ --shell=shell_path ] [ --uid=UID ]
```

Specifies a user to be created on the system.

`vnc`

```
vnc [ --host=hostname ] [ --port=port ]
    [ --password=password ]
```

Specifies parameters for running a VNC server on the system being installed.

`xconfig`

```
xconfig [ --defaultdesktop={GNOME|KDE} ]
        [ --depth={8|16|24|32} ]
        [ --resolution=XxY ]
        [ --startxonboot ]
```

Specifies X Window System parameters.

`zerombr`

Specifies whether to clear the existing disk partitions. This option is specified by default.

`zfcp`

```
zfcp [ --devnum=num ] [ --fcplun=lun ]
     [ --scsiid=id ] [ --scsilun=lun ]
     [ --wwpn=name ]
```

Specifies zFCP parameters for Fibre Channel-attached SCSI devices.

Appendix B Sample Package Lists

The following packages provide a suitable minimum (*Just Enough OS*) installation to support Spacewalk OSA and remote configuration. You can use the yum command to install any other packages that you require to configure an Oracle Linux server.

```
@ Base
osad
rhncfg
rhncfg-actions
rhncfg-client
rhncfg-management
```

The following package list is suitable for a basic Oracle Linux 6 server without desktop support.

```
@ Base
@ client-mgmt-tools
@ console-internet
@ core
@ debugging
@ directory-client
@ hardware-monitoring
@ java-platform
@ large-systems
@ network-file-system-client
@ performance
@ perl-runtime
@ server-platform
@ server-policy
@ uek3-kernel-repo
certmonger
device-mapper-persistent-data
krb5-workstation
oddjob
osad
pam_krb5
pax
perl-DBD-SQLite
python-dmidecode
samba-winbind
sgpio
```

The following package list is suitable for an Oracle Linux 6 development system with desktop support.

```
@ Base
@ additional-devel
@ basic-desktop
@ client-mgmt-tools
@ compat-libraries
@ console-internet
@ core
@ debugging
@ desktop-debugging
@ desktop-platform
@ desktop-platform-devel
@ development
@ directory-client
@ eclipse
@ fonts
@ general-desktop
@ graphical-admin-tools
@ input-methods
@ internet-browser
@ java-platform
@ legacy-x
@ network-file-system-client
@ network-tools
@ perl-runtime
@ print-client
@ remote-desktop-clients
@ server-platform
@ server-platform-devel
@ server-policy
@ storage-client-iscsi
@ system-admin-tools
@ x11
abrt-gui
ant
certmonger
desktop-file-utils
genisoimage
gnutls-devel
jpackage-utils
junit
krb5-workstation
libbonobo-devel
libdrm-devel
libgcrypt-devel
libglade2-devel
libgnomeui-devel
libXau-devel
libXinerama-devel
libXmu
libXmu-devel
libXp
libXrandr-devel
libxslt-devel
mtools
oddjob
openmotif
openmotif-devel
osad
pam_krb5
pax
perl-DBD-SQLite
popt-devel
python-dmidecode
rpmdevtools
rpmlint
sgpio
startup-notification-devel
wodim
xorg-x11-proto-devel
```

Appendix C Configuration File Macros

You can use the following standard macros with configuration files:

`rhn.system.custom_info(key_name)`

Value of the key *`key_name`* associated with the system.

`rhn.system.description`

System description.

`rhn.system.hostname`

System host name.

`rhn.system.ip_address`

Default system IP address.

`rhn.system.net_interface.broadcast(ethN)`

Broadcast address associated with `ethN`.

`rhn.system.net_interface.driver_module(ethN)`

Network interface driver module associated with `ethN`.

`rhn.system.net_interface.hardware_address(ethN)`

MAC address associated with `ethN`.

`rhn.system.net_interface.ip_address(ethN)`

IP address associated with `ethN`.

`rhn.system.net_interface.netmask(ethN)`

Network mask associated with `ethN`.

`rhn.system.profile_name`

Kickstart profile associated with a system.

`rhn.system.sid`

Spacewalk system ID.

Appendix D Spacewalk XML/RPC API

Advanced users can use the Spacewalk XML/RPC API to create web interfaces or scripts to perform or automate tasks. More information about the API is available at `https://swksvr_FQDN/rpc/api` on a Spacewalk server.

For example, the following Python script `get-channel-summaries` uses the API to obtain a list of channels, the numbers of packages in each channel, and the number of systems that are subscribed to each channel.

```
#!/usr/bin/python
#
#  get-channel-summaries [--server URL <url>] [--username <user>] [--password <passwd>]

import getopt, struct, sys, xmlrpclib
from array import *

# Insert default values for the Spacewalk server API URL,
# Spacewalk admin user name, and Spacewalk admin password
url = "https://swksvr.mydom.com/rpc/api"
username = "swadmin"
password = "swadmin"

usage1 = "Usage: get-channel-summaries [--serverUrl <url>] \\\n"
usage2 = "         [--username <user>] [--password <passwd>]"

try:
    opts,args = getopt.getopt(sys.argv[1:],"s:u:p:",["serverUrl=","username=","password="])
except getopt.GetoptError as err:
    print(usage1+usage2)
    sys.exit(1)

for o,a in opts:
    if o in ("-s", "--serverUrl"):
        url = a
    elif o in ("-u", "--username"):
        username = a
    elif o in ("-p", "--password"):
        password = a
    else:
        assert False, "Unknown option"

# Connect to Spacewalk
client = xmlrpclib.Server(url,verbose=0)
session = client.auth.login(username,password)

# Get channel list
channels = client.channel.listAllChannels(session)

# Build channel arrays indexed by channel ID
channel_label = {}
channel_packages = {}
channel_systems = {}

for channel in channels:
    channel_label[channel['id']] =  channel['label']
    channel_packages[channel['id']] =  channel['packages']
    channel_systems[channel['id']] =  channel['systems']

# Print output header
fmt1 = '{0:<40s}{1:<10s}{2:<10s}'
print fmt1.format('Channel label','Packages','Systems')
print fmt1.format('-------------','--------','-------')
```

```
# Print channel label, package count, and system count -- sorted by label
fmt2 = '{0:<40s}{1:<10d}{2:<10d}'
for key,value in sorted(channel_label.iteritems(),key=lambda(k,v): (v,k)):
    id = int(key)
    print fmt2.format(value,channel_packages[id],channel_systems[id])

# Disconnect from Spacewalk
client.auth.logout(session)
```

The following is sample output from this command:

```
Channel label                           Packages  Systems
-------------                           --------  -------
oraclelinux6-x86_64                     6595      4
oraclelinux6-x86_64-addons              230       4
oraclelinux6-x86_64-mysql               204       0
oraclelinux6-x86_64-playground          826       0
oraclelinux6-x86_64-spacewalk20-client  43        0
oraclelinux6-x86_64-spacewalk20-server  270       0
oraclelinux6-x86_64-spacewalk22-client  30        4
oraclelinux6-x86_64-spacewalk22-server  274       0
oraclelinux6-x86_64-uek                 387       0
oraclelinux6-x86_64-uek-r3              292       4
oraclelinux6_u6_x86_64-patch            1332      4
```

The next example script `get-reposync-list` displays the schedules for synchronizing repositories.

```
#!/usr/bin/python
#
#  get-reposync-list [--serverUrl <url>] [--username <user>] [--password <passwd>]

import getopt, struct, sys, xmlrpclib
from array import *

# Insert default values for the Spacewalk server API URL,
# Spacewalk admin user name, and Spacewalk admin password
url = "https://swksvr.mydom.com/rpc/api"
username = "swadmin"
password = "swadmin"

usage1 = "Usage: get-reposync-list [--serverUrl <url>] \\\n"
usage2 = "         [--username <user>] [--password <passwd>]"

try:
    opts,args = getopt.getopt(sys.argv[1:],"s:u:p:",["serverUrl=","username=","password="])
except getopt.GetoptError as err:
    print(usage1+usage2)
    sys.exit(1)

for o,a in opts:
    if o in ("-s", "--serverUrl"):
        url = a
    elif o in ("-u", "--username"):
        username = a
    elif o in ("-p", "--password"):
        password = a
    else:
        assert False, "Unknown option"

# Connect to Spacewalk
client = xmlrpclib.Server(url,verbose=0)
session = client.auth.login(username,password)

# Get channel list
```

```
channels = client.channel.listAllChannels(session)

# Build channel name array indexed by channel ID
channel_label = {}
channel_schedule = {}

for channel in channels:
    id = int(channel['id'])
    channel_label[id] =  channel['label']
    channel_schedule[id] = ''

# Get repository synchronization list
schedules = client.taskomatic.org.listActiveSchedulesByBunch(session,'repo-sync-bunch')

# Construct schedule array indexed by channel ID
for schedule in schedules:
    channel_schedule[int(schedule['data_map']['channel_id'])] = schedule['cron_expr']

# Print output header
fmt = '{0:<40s}{1:<40s}'
print fmt.format('Channel label','Schedule')
print fmt.format('-------------','--------')

# Print channel labels and repository synchronization schedule (if defined)
for key,value in sorted(channel_label.iteritems(),key=lambda(k,v):(v,k)):
    id = int(key)
    sched = channel_schedule[id]
    if (len(sched) > 0):
        print fmt.format(value,sched)
    else:
        print fmt.format(value,"Sync not scheduled")

# Disconnect from Spacewalk
client.auth.logout(session)
```

The following is sample output from this command:

```
Channel label                           Schedule
-------------                           --------
oraclelinux6-x86_64                     0 30 0 ? * *
oraclelinux6-x86_64-addons              0 30 2 ? * *
oraclelinux6-x86_64-mysql               0 30 4 ? * *
oraclelinux6-x86_64-playground          0 30 3 ? * *
oraclelinux6-x86_64-spacewalk20-client  0 0 5 ? * *
oraclelinux6-x86_64-spacewalk20-server  0 30 5 ? * *
oraclelinux6-x86_64-spacewalk22-client  0 0 2 ? * *
oraclelinux6-x86_64-spacewalk22-server  0 0 3 ? * *
oraclelinux6-x86_64-uek                 0 0 4 ? * *
oraclelinux6-x86_64-uek-r3              0 30 1 ? * *
oraclelinux6_u6_x86_64-patch            0 0 1 ? * *
```