SUSE Manager

1.2

www.novell.com

February 21, 2011

Reference Guide

Reference Guide

All information found in this book has been compiled with utmost attention to detail. However, this does not guarantee complete accuracy. Neither Novell, Inc., SUSE LINUX Products GmbH, the authors, nor the translators shall be held liable for possible errors or the consequences thereof.

Contents

About This Guide

SUSE® Manager lets you efficiently manage a set of Linux systems and keep them up-to-date. It provides automated and cost-effective software management, asset management, system provisioning, and monitoring capabilities. SUSE Manager is compatible with Red Hat Network Satellite Server and offers seamless management of both SUSE® Linux Enterprise and Red Hat Enterprise Linux client systems.

This manual is intended for system administrators. It guides you through registering systems with SUSE Manager, configuring its daemon, using the Web interface, monitoring client systems, and other features. Furthermore it gives you an overview how multiple organizations and their systems can be administered.

Many chapters in this manual contain links to additional documentation resources. These include additional documentation that is available on the system as well as documentation available on the Internet.

For an overview of the documentation available for your product and the latest documentation updates, refer to `http://www.novell.com/documentation/suse_manager/` or to the following section.

HTML versions of the manuals are also available from the *Help* tab of the SUSE Manager Web interface.

NOTE: Obtaining the Release Notes

Although this manual reflects the most current information possible, read the *SUSE Manager Release Notes* for information that may not have been available prior to the finalization of the documentation. The notes can be found at `http://www.novell.com/documentation/suse_manager/`.

1 Available Documentation

The following manuals are available on this product:

Quick Start (↑Quick Start)
: Guides you step-by-step through the installation, setup and basic configuration of SUSE Manager.

Installation Guide (↑Installation Guide)
: Lists installation scenarios and example topologies for different SUSE Manager setups. Also contains detailed information about SUSE Manager maintenance and troubleshooting.

Client Configuration Guide (↑Client Configuration Guide)
: Describes best practices for setting up clients to connect to a SUSE Manager server or SUSE Manager Proxy.

Reference Guide (page 1)
: Reference documentation that covers administration topics like registering and updating client systems, configuring the SUSE Manager daemon, using the Web interface, monitoring client systems, and more. Also contains a glossary with key terms used in the SUSE Manager context.

HTML versions of the product manuals can be found in the installed system under `/usr/share/doc/manual`. Find the latest documentation updates at http://www.novell.com/documentation where you can download PDF or HTML versions of the manuals for your product.

2 Feedback

Several feedback channels are available:

Bugs and Enhancement Requests
: For services and support options available for your product, refer to http://www.novell.com/services/.

  To report bugs for a product component, please use http://support.novell.com/additional/bugreport.html.

  Submit enhancement requests at https://secure-www.novell.com/rms/rmsTool?action=ReqActions.viewAddPage&return=www.

User Comments

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Use the User Comments feature at the bottom of each page in the online documentation or go to `http://www.novell.com/documentation/feedback.html` and enter your comments there.

3 Documentation Conventions

The following typographical conventions are used in this manual:

- `/etc/passwd`: directory names and filenames
- *`placeholder`*: replace *`placeholder`* with the actual value
- `PATH`: the environment variable PATH
- `ls`, `--help`: commands, options, and parameters
- `user`: users or groups
- Alt, Alt + F1: a key to press or a key combination; keys are shown in uppercase as on a keyboard
- *File*, *File* > *Save As*: menu items, buttons
- ► **amd64 em64t:** This paragraph is only relevant for the specified architectures. The arrows mark the beginning and the end of the text block. ◄
- *Dancing Penguins* (Chapter *Penguins*, ↑Another Manual): This is a reference to a chapter in another manual.

Package Update Tools (SLE and RHEL) 1

On the supported client systems various software management and package update tools are in use—not only GUI programs and desktop applets, but also command-line tools.

WARNING: Updating SUSE Manager

For updating SUSE Manager server, additional steps might be required. Refer to Section “Updating SUSE Manager” (↑Installation Guide) for detailed instructions.

1.1 Updating Packages on SLE

YaST Online Update (`yast2 online_update`) is the desktop update application for SUSE Linux Enterprise. Using this tool, you can update packages and read details on the updated packages, such as bug fix information, security alerts, enhancements, and more. For more information, refer to Section 1.1.1, “Using YaST Online Update” (page 2).

Use `zypper`, if you want to manage software updates with command line tools. For more information, refer to Section 1.1.2, “Updating Packages from the Command Line with Zypper” (page 6).

For background information, see the SUSE Linux Enterprise Deployment Guide, Chapter 9.0 *Installing or Removing Software* (using desktop applets). SUSE Linux

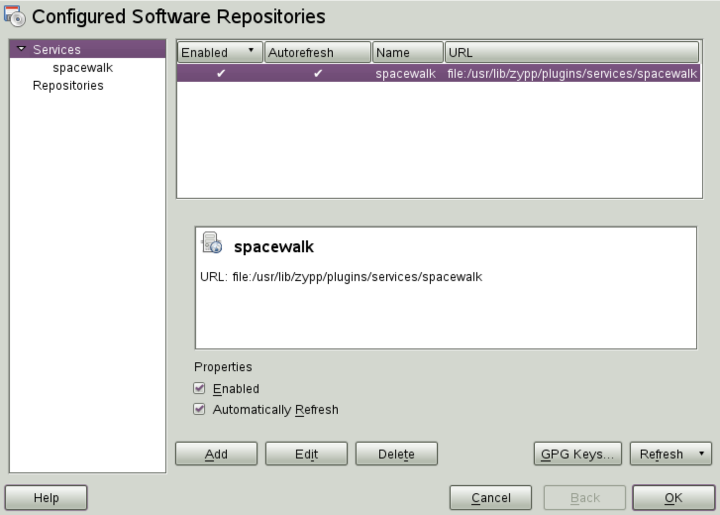
Enterprise Administration Guide, Chapter 1.0 *YaST Online Update*, and Chapter 4.0 *Managing Software with Command Line Tools* (zypper).

If you enable the *Auto Patch Update*, installing updates will take place automatically, pushed from SUSE Manager. For more information about this feature, refer to Auto Patch Update (page 67).

1.1.1 Using YaST Online Update

Novell offers a continuous stream of software security updates for your product. By default the update applet is used to keep your system up-to-date. This section covers the tool for updating software packages: YaST Online Update.

Figure 1.1 *YaST Software Repositories*



Configured Software Repositories

Enabled	Autorefresh	Name	URL
✓	✓	spacewalk	file:/usr/lib/zypp/plugins/services/spacewalk

spacewalk

URL: file:/usr/lib/zypp/plugins/services/spacewalk

Properties

☑ Enabled

☑ Automatically Refresh

After activating the SUSE Linux Enterprise Server client system, SUSE Manager channels are available as a `spacewalk` repository service (see Figure 1.1, “YaST Software Repositories” (page 2)) and you can use YaST to install software updates on the client system. For more information about client activation, refer to Section “Client Setup” (↑Quick Start) and Section 3.4.6, “Activation Keys — [Mgmt]” (page 94).

Novell provides updates with different relevance levels. `Security` updates fix severe security hazards and should definitely be installed. `Recommended` updates fix issues that could compromise your computer, whereas `Optional` updates fix non-security relevant issues or provide enhancements.

Procedure 1.1 *Installing Patches with YaST Online Update*

1 Run *Software* > *Online Update* in YaST

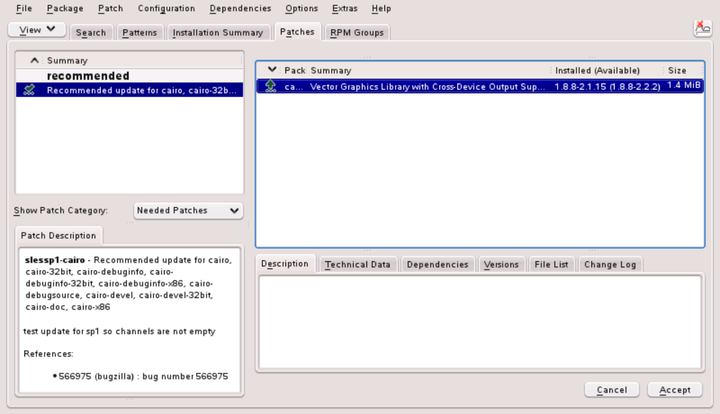
2 All new patches (except the optional ones) that are currently available for your system are already marked for installation. Click *Accept* or *Apply* to automatically install them.

3 Confirm with *Finish* after the installation has completed. Your system is now up-to-date.

Installing Patches Manually Using the Qt Interface

The *Online Update* window consists of four sections. The list of all patches available is on the left. Find the description of the selected patch displayed below the list of patches. The right column lists the packages included in the selected patch (a patch can consist of several packages) and below, a detailed description of the selected package.

Figure 1.2 *YaST Online Update*



Summary
recommended
Recommended update for cairo, cairo-32b...

Show Patch Category: Needed Patches

Pack	Summary	Installed (Available)	Size
ca...	Vector Graphics Library with Cross-Device Output Sup...	1.8.8-2.1.15 (1.8.8-2.2.2)	1.4 MiB

Patch Description

slessp1-cairo - Recommended update for cairo, cairo-32bit, cairo-debuginfo, cairo-debuginfo-32bit, cairo-debuginfo-x86, cairo-debugsource, cairo-devel, cairo-devel-32bit, cairo-doc, cairo-x86

test update for sp1 so channels are not empty

References:

- 566975 (bugzilla) : bug number 566975

The patch display lists the available patches for the client system. The patches are sorted by security relevance (`security`, `recommended`, and `optional`). There are three different views on patches. Use *Show Patch Category* to toggle the views:

Needed Patches (default view)
: Non-installed patches that apply to packages installed on your system.

Unneeded Patches
: Patches that either apply to packages not installed on your system, or patches that have requirements which have already have been fulfilled (because the relevant packages have already been updated from another source).

All Patches
: All patches available for the client system.

A list entry consists of a symbol and the patch name. For a list of possible symbols, press Shift + F1. Actions required by `Security` and `Recommended` patches are automatically preset. These actions are *Autoinstall*, *Autoupdate* and *Autodelete*. Actions for `Optional` patches are not preset—right-click on a patch and choose an action from the list.

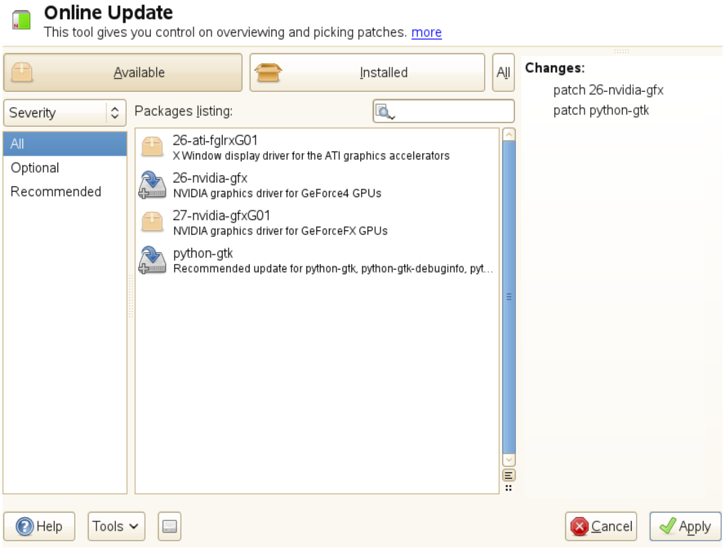
If you install an up-to-date package from a repository other than the update repository, the requirements of a patch for this package may be fulfilled with this installation. In this case a check mark is displayed in front of the patch summary. The patch will be visible in the list until you mark it for installation. This will in fact not install the patch (because the package already is up-to-date), but mark the patch as having been installed.

Most patches include updates for several packages. If you want to change actions for single packages, right-click on a package in the package window and choose an action. Once you have marked all patches and packages as desired, proceed with *Accept*.

Installing Patches Manually Using the GTK Interface

The *Online Update* window consists of two main sections. The left pane lists all patches and provides different filters for the patch list. See the right pane for a list of changes that will carried out once you *Apply* them.

Figure 1.3 *YaST Online Update*



Online Update

This tool gives you control on overviewing and picking patches. more

Changes:

patch 26-nvidia-gfx

patch python-gtk

26-ati-fglrxG01
X Window display driver for the ATI graphics accelerators

26-nvidia-gfx
NVIDIA graphics driver for GeForce4 GPUs

27-nvidia-gfxG01
NVIDIA graphics driver for GeForceFX GPUs

python-gtk
Recommended update for python-gtk, python-gtk-debuginfo, pyt...

Patch List Filters

Available
: Non-installed patches that apply to packages installed on your system.

Installed
: Patches that are already installed.

All
: Patches that are either already installed or available.

Severity
: Only show *Optional*, *Recommended*, or *Security* patches. By default, *All* patches are shown.

Repositories
: This filter lets you display the patches per repository.

Packages Listing
: Apply your custom filter here.

Click on a patch entry to open a row with detailed information about the patch in the bottom of the window. Here you can see a detailed patch description as well as the versions available. You can also choose to *Install* optional patches—security and recommended patches are already preselected for installation.

Automatic Online Update

YaST also offers the possibility to set up an automatic update. Open *Software* > *Online Update Configuration*. Check *Automatic Online Update* and choose whether to update *Daily*, *Weekly*, or *Monthly*. Some patches, such as kernel updates, require user interaction, which would cause the automatic update procedure to stop. Therefore you should check *Skip Interactive Patches* if you want the update procedure to proceed fully automatically. Having done so, you should run a manual *Online Update* from time to time in order to install patches that require interaction.

1.1.2 Updating Packages from the Command Line with Zypper

Zypper is a command line package manager for installing, updating and removing packages as well as for managing repositories. It is especially useful for accomplishing remote software management tasks or managing software from shell scripts.

For more information on managing software from the command line, enter `zypper help` or `zypper help` *`command`* or see the `zypper(8)` manpage. .

General Usage

The general syntax of Zypper is:

```
zypper [global-options] command [command-options] [arguments] ...
```

The components enclosed in brackets are not required. The simplest way to execute Zypper is to type its name, followed by a command. For example, to apply all needed patches to the system type:

```
zypper patch
```

Additionally, you can choose from one or more global options by typing them just before the command. For example, `--non-interactive` means running the command without asking anything (automatically applying the default answers):

```
zypper --non-interactive patch
```

To use the options specific to a particular command, type them right after the command. For example, `--auto-agree-with-licenses` means applying all needed patches to the system without asking to confirm any licenses (they will automatically be accepted):

```
zypper patch --auto-agree-with-licenses
```

Some commands require one or more arguments. When using the install command, for example, you need to specify which package(s) to install:

```
zypper install mplayer
```

Some options also require an argument. The following command will list all known patterns:

```
zypper search -t pattern
```

You can combine all of the above. For example, the following command will install `mplayer` and `amarok` packages using the `factory` repository only, and be verbose:

```
zypper -v install --repo factory mplayer amarok
```

Most Zypper commands have a `dry-run` option that does a simulation of the given command. It can be used for test purposes.

```
zypper remove --dry-run MozillaFirefox
```

Installing and Removing Software with Zypper

To install or remove packages use the following commands:

```
zypper install package
zypper remove package
```

Zypper knows various ways to address packages for the install and remove commands:

by the exact package name

```
    zypper in MozillaFirefox
```

by repository alias and package name

```
zypper in mozilla:MozillaFirefox
```

Where `mozilla` is the alias of the repository from which to install.

by package name using wildcards

The following command will install all packages that have names starting with “Moz”. Use with care, especially when removing packages.

```
zypper in Moz*
```

by capability

If you, for example, would like to install a perl module without knowing the name of the package, capabilities come in handy:

```
zypper in 'perl(Time::ParseDate)'
```

by capability and/or architecture and/or version

Together with a capability you can specify an architecture (such as `i586` or `x86_64`) and/or a version. The version must be preceded by an operator: < (lesser than), <= (lesser than or equal), = (equal>, >= (greater than or equal), > (greater than).

```
zypper in 'firefox.x86_64'
zypper in 'firefox>=3.5.3'
zypper in 'firefox.x86_64>=3.5.3'
```

by path

You can also specify a local or remote path to a package:

```
zypper in /tmp/install/MozillaFirefox.rpm
zypper in
http://download.opensuse.org/repositories/mozilla/SUSE_Factory/x86_64/MozillaFirefox-3.5.3-1.3.x86_64.rpm
```

To install and remove packages simultaneously use the +/– modifiers. To install `emacs` and remove `vim` simultaneously, use:

```
zypper install emacs -vim
```

To remove `emacs` and install `vim` simultaneously, use:

```
zypper remove emacs +vim
```

To prevent the package name starting with the – being interpreted as a command option, always use it as the second argument. If this is not possible, precede it with `--`:

```
zypper install -emacs +vim       # Wrong
zypper install vim -emacs        # Correct
zypper install -- -emacs +vim    # same as above
zypper remove emacs +vim         # same as above
```

By default, Zypper asks for a confirmation before installing or removing a selected package, or when a problem occurs. You can override this behavior using the `--non-interactive` option. This option must be given before the actual command (install, remove, and patch) as in the following:

```
zypper --non-interactive install package_name
```

This option allows the use of Zypper in scripts and cron jobs.

WARNING: Do not Remove Mandatory System Packages

Do not remove packages such as `glibc`, `zypper`, `kernel`, or similar packages. These packages are mandatory for the system and, if removed, may cause the system to become unstable or stop working altogether.

Installing Source Packages

If you want to install the corresponding source package of a package, use:

```
zypper source-install package_name
```

That command will also install the build dependencies of the specified package. If you do not want this, add the switch `-D`. To install only the build dependencies use `-d`.

```
zypper source-install -D package_name # source package only
zypper source-install -d package_name # build dependencies only
```

Of course, this will only work if you have the repository with the source packages enabled in your repository list (it is added by default, but not enabled). See the section called “Managing Repositories with Zypper” (page 12) for details on repository management.

A list of all source packages available in your repositories can be obtained with:

```
zypper search -t srcpackage
```

Utilities

To verify whether all dependencies are still fulfilled and to repair missing dependencies, use:

```
zypper verify
```

In addition to dependencies that must be fulfilled, some packages “recommend” other packages. These recommended packages are only installed if actually available. In case recommended packages were made available after the recommending package has been installed (by adding additional packages), use the following command:

```
zypper install-new-recommends
```

Updating Software with Zypper

There are three different ways to update software using Zypper: by installing patches, by installing a new version of a package or by updating the entire distribution. The latter is achieved with the `zypper dist-upgrade` command.

Installing Patches

To install all officially released patches applying to your system, just run:

```
zypper patch
```

In this case, all patches available in your repositories are checked for relevance and installed, if necessary. After registering your SUSE Manager installation, an official update repository containing such patches will be added to your system. The above command is all you must enter in order to apply them when needed.

Zypper knows three different commands to query for the availability of patches:

`zypper patch-check`

Lists the number of needed patches (patches, that apply to your system but are not yet installed)

```
~ # zypper patch-check
Loading repository data...
Reading installed packages...
5 patches needed (1 security patch)
```

`zypper list-patches`

Lists all needed patches (patches, that apply to your system but are not yet installed)

```
~ # zypper list-updates
Loading repository data...
Reading installed packages...
S | Repository | Name                           | Current | Available   | Arch
--+------------+--------------------------------+---------+-------------+-------
v | Updates    | update-test-interactive        | 0-2.35  | 0-9999.1.2 | noarch
v | Updates    | update-test-optional           | 0-2.35  | 0-9999.1.2 | noarch
v | Updates    | update-test-reboot-needed      | 0-2.35  | 0-9999.1.2 | noarch
v | Updates    | update-test-relogin-suggested | 0-2.35  | 0-9999.1.2 | noarch
v | Updates    | update-test-security           | 0-2.35  | 0-9999.1.2 | noarch
```

`zypper patches`

Lists all patches available for SUSE Manager, regardless of whether they are already installed or apply to your installation.

It is also possible to list and install patches relevant to specific issues. To list specific patches, use the `zypper list-patches` command with the following options:

`-b`

Lists all needed patches for Bugzilla issues.

`--bugzilla[=`*`number`*`]`

Lists needed patches for the Bugzilla issue with the specified number.

To install a patch for a specific issue, use command:

```
zypper patch --bugzilla=number
```

Installing Updates

If a repository contains only new packages, but does not provide patches, `zypper patch` does not show any effect. To update all installed packages with newer available versions, use:

```
zypper update
```

To update individual packages, specify the package with either the update or install command:

```
zypper update package
zypper install package
```

A list of all new packages available can be obtained with the command:

```
zypper list-updates
```

NOTE: Differences between `zypper update` and `zypper dist-upgrade`

Choose `zypper update` to update packages to newer versions available for your product version while maintaining system integrity. `zypper update` will honor the following rules:

no vendor changes
no architecture changes
no downgrades
keep installed packages

To upgrade your installation to a new product version use `zypper dist-upgrade` with the required repositories (see the section called “Managing Repositories with Zypper” (page 12) for details). This command ensures that all packages will be installed from the repositories currently enabled. This rule is enforced, so packages might change vendor or architecture or even might get downgraded. All packages that have unfulfilled dependencies after the upgrade will be uninstalled.

Managing Repositories with Zypper

All installation or patch commands of Zypper rely on a list of known repositories. To list all repositories known to the system, use the command:

```
zypper repos
```

The result will look similar to the following output:

```
# | Alias                             | Name
   | Enabled | Refresh
--+-----------------------------+-----------------------------+--------+-------
1 | SUSE-Linux-Enterprise-Server 11-0 | SUSE-Linux-Enterprise-Server 11-0
 | Yes     | No
2 | SLES-11-Updates                   | SLES 11 Online Updates
   | Yes     | Yes
3 | broadcomdrv                       | Broadcom Drivers
   | Yes     | No
```

When specifying repositories in various commands, an alias, URI or repository number from the `zypper repos` command output can be used. Note however that the numbers can change after modifying the list of repositories. The alias will never change by itself.

By default, details as the URI or the priority of the repository is not displayed. Use the following command to list all details:

Adding Repositories

To add a repository, run

```
zypper addrepo URI Alias
```

`URI` can either be an Internet repository, a network resource, a directory or a CD or DVD (see `http://en.opensuse.org/Libzypp/URI` for details). The *`Alias`* is a shorthand and unique identifier of the repository. You can freely choose it, with the only exception that is has to be unique. Zypper will issue a warning if you specify an alias that is already in use. To make working with repositories more convenient, use short and easy-to-remember aliases.

Removing Repositories

If you want to remove a repository from the list, use the command `zypper removerepo` together with the alias or number of the repository you want to delete. To remove the 3rd entry from the example, use the following command:

```
zypper removerepo 3
```

Modifying Repositories

Enable or disable repositories with `zypper modifyrepo`. You can also alter the repository's properties (such as refreshing behavior, name or priority) with this command. The following command will enable the repository name “updates”, turn on auto-refresh and set it's priority to 20:

```
zypper mr -er -p 20 'updates'
```

Modifying repositories is not limited to a single repository—you can also operate on groups:

`-a`: all repositories
`-l`: local repositories

-t: remote repositories

-m *TYPE*: repositories of a certain type (*TYPE* can be one of the following: http, https, ftp, cd, dvd, dir, file, cifs, smb, nfs, hd, iso)

To rename a repository alias, use the `renamerepo` command. The following example changes the alias from “Mozilla Firefox” to just “firefox”:

```
zypper renamerepo 'Mozilla Firefox' firefox
```

Querying Repositories and Packages with Zypper

Zypper offers various methods to query repositories or packages. To get lists of all products, patterns, packages or patches available, use the following commands:

```
zypper products
zypper patterns
zypper packages
zypper patches
```

To query all repositories for certain packages, use `search`. It works on package names, capabilities or, optionally, on package summaries and descriptions. Using the wildcards * and ? with the search term is allowed. By default, the search is not case-sensitive.

```
zypper se firefox       # simple search for "firefox"
zypper se *fire*        # using wildcards
zypper se -d fire       # also search in package descriptions and summaries
zypper se -u firefix    # only display packages not already installed
```

To search for packages which provide a special capability, use the command `what-provides`. If you, for example, would like to know which package provides the perl Module `SVN::Core`, use the following command:

```
zypper what-provides 'perl(SVN::Core)'
```

To query single packages, use `info` with an exact package name as an argument. It displays detailed information about a package. Use the options `--requires` and `--recommends` to also show what is required/recommended by the package:

```
zypper info --requires MozillaFirefox
```

The `what-provides` *`package`* is similar to `rpm -q --whatprovides` *`package`*, but rpm is only able to query the RPM database (that is the database of all installed packages). Zypper, on the other hand, will tell you about providers of the capability from any repository, not only those that are installed.

1.2 Updating Packages on RHEL 5

Depending on your version of Red Hat Enterprise Linux, systems registered with SUSE Manager can update client systems directly using various tools and applications installed on the system. For Red Hat Enterprise Linux 5, you can use the Package Updater (or `pup`) to keep systems updated.

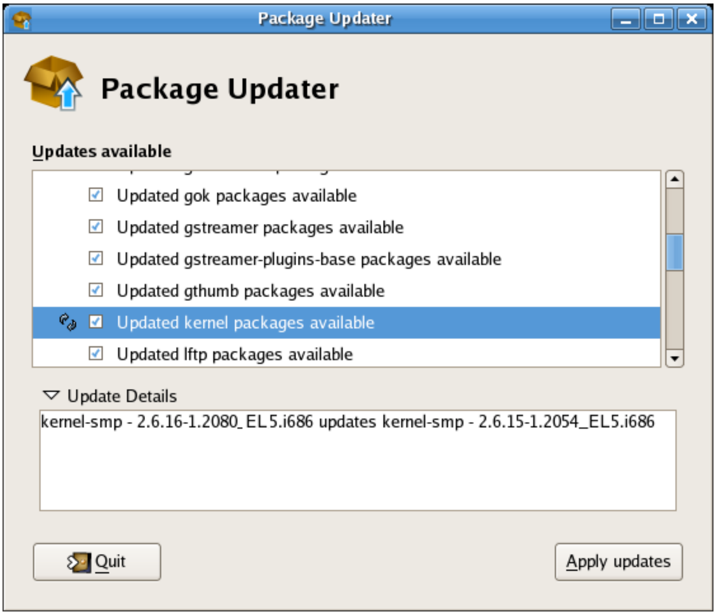
The Package Updater (`pup`) is the desktop update application for Red Hat Enterprise Linux 5. Using this tool, you can update packages and read details on the updated packages, such as bug fix information, security alerts, enhancements, and more.

1.2.1 Using the Package Updater

To start the Package Updater from the desktop, open *Applications* (the main menu on the panel), then click *System Tools* > Package Updater.

If you are at a shell prompt window, type `pup` to open the Package Updater.

***Figure 1.4** Package Updater Interface*



☑ Updated gok packages available
☑ Updated gstreamer packages available
☑ Updated gstreamer-plugins-base packages available
☑ Updated gthumb packages available
☑ Updated kernel packages available
☑ Updated lftp packages available

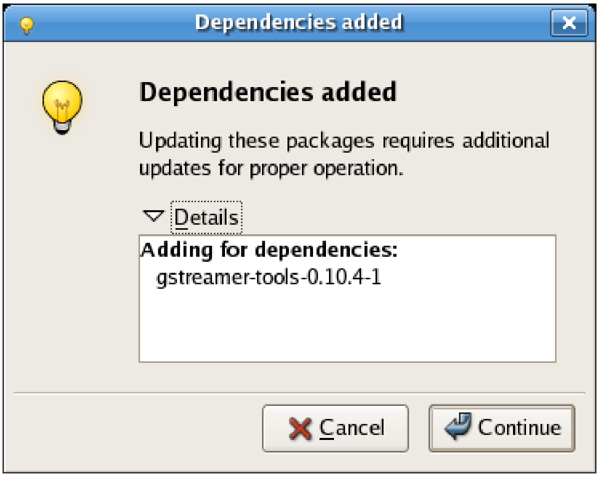
kernel-smp - 2.6.16-1.2080_EL5.i686 updates kernel-smp - 2.6.15-1.2054_EL5.i686

If there are multiple package updates, they will be listed with checkmarks next to them so that you can choose which files to update. Some packages (for example, kernel packages) may have a circular arrow icon next to them, indicating that you are required to reboot your system after updating the package.

To view the update details of any package, highlight the package and click the arrow next to *Update Details*.

When you are ready to update the packages, click Apply updates. The Updater will resolve any dependencies, and notify you when a package must be installed to meet a dependency for an updated package.

Figure 1.5 *Package Dependency*



Dependencies added

Updating these packages requires additional updates for proper operation.

Adding for dependencies:
gstreamer-tools-0.10.4-1

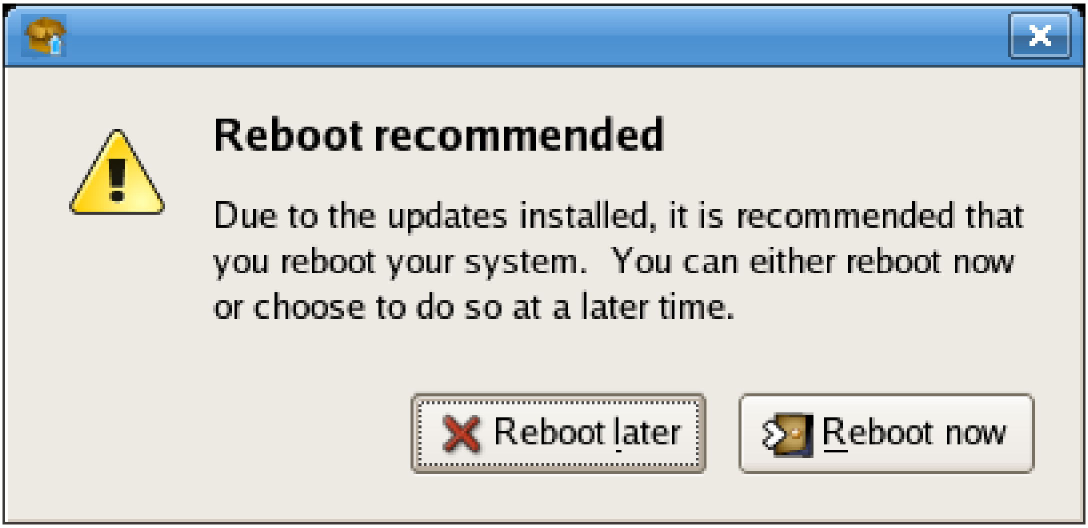
Click Continue to accept the dependency and resume the update.

If this is the first time using the Package Updater, the program will prompt you to imort the Red Hat GPG security key that verifies that a package has been signed and is certified for Red Hat Enterprise Linux.

Click Import Key to accept the Key and continue with the update.

When the update completes, you may be prompted to reboot your system for the changes to take effect.

Figure 1.6 *Reboot Prompt*



Reboot recommended

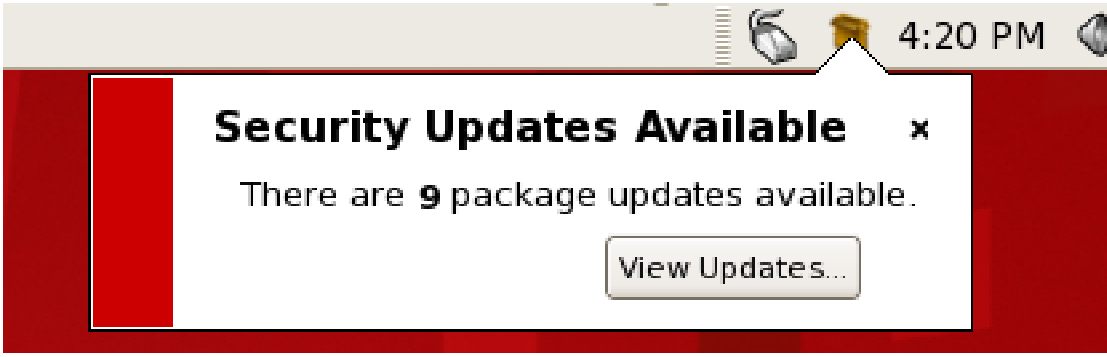
Due to the updates installed, it is recommended that you reboot your system. You can either reboot now or choose to do so at a later time.

You can choose to reboot now or later, but it is recommended to click Reboot Now to start using the updated packages.

1.2.2 The Package Updater Applet

Red Hat Enterprise Linux 5 also features a a running program on the graphical desktop panel that periodically checks for updates from the SUSE Manager server and will alert users when a new update is available.

Figure 1.7 Package Updater Applet



Security Updates Available

There are 9 package updates available.

The Package Updater Applet stays in the notification tray of the desktop panel and checks for new updates periodically. The applet also allows you to perform a few package maintenance tasks from the applet by clicking the notification icon and choosing from the following actions:

- *Refresh* — Check SUSE Manager for new updates
- *View Updates* — launches the Package Updater application so that you can see any available updates in more detail and configure the updates to your specifications
- *Apply Updates* — Download and Install all updated packages.
- *Quit* — close the applet

1.2.3 Updating Packages from the Command Line with yum

The foundation of the Package Updater is the Yum package manager, developed by Duke University to improve the installation of RPMs. `yum` searches supported repositories for packages and their dependencies so they may be installed together in an effort to alleviate dependency issues. Red Hat Enterprise Linux 5 uses `yum` to fetch packages and install packages.

`up2date` is not available on Red Hat Enterprise Linux 5, which uses Yum (Yellowdog Updater Modified). The entire stack of tools that installs and updates software in Red

Hat Enterprise Linux 5 is now based on Yum. This includes everything from the initial installation via `Anaconda` installation program to host software management tools like pirut.

yum Commands

yum commands are typically typed as the following:

```
yum command [package_name]
```

By default, Yum will automatically attempt to check all configured repositories to resolve all package dependencies during an installation or upgrade. The following is a list of the most commonly-used `yum` commands. For a complete list of available yum commands, refer to `man yum`.

`yum install` *`package_name`*

Used to install the latest version of a package or group of packages. If no package matches the specified package name(s), they are assumed to be a shell wildcard, and any matches are then installed.

yum update *`package_name`*

Used to update the specified packages to the latest available version. If no packages are specified, then `yum` will attempt to update all installed packages.

If the `--obsoletes` option is used (i.e. `yum --obsoletes` *`package_name`*), yum will process obsolete packages. As such, packages that are obsoleted across updates will be removed and replaced accordingly.

yum check-update

This command allows you to determine whether any updates are available for your installed packages. `yum` returns a list of all package updates from all repositories if any are available.

yum remove *`package_name`*

Used to remove specified packages, along with any other packages dependent on the packages being removed.

yum provides *`package_name`*

Used to determine which packages provide a specific file or feature.

yum search *`keyword`*
: This command is used to find any packages containing the specified keyword in the description, summary, packager and package name fields of RPMs in all supported repositories.

yum localinstall *`absolute path to filename`*
: Used when using yum to install a package located locally in the machine.

1.3 Red Hat Update Agent (RHEL 4)

The Red Hat Update Agent is your connection to SUSE Manager on Red Hat Enterprise Linux 4. It enables you to register your systems, create System Profiles, and alter the settings by which your organization and SUSE Manager interact. Once registered, your systems can use the Red Hat Update Agent to retrieve the latest software packages. This tool allows you to always have the most up-to-date Red Hat Enterprise Linux systems with all security updates, bug fixes, and software package enhancements.

Remember, this tool must be run on the system you wish to update. You cannot use the Red Hat Update Agent on the system if it is not entitled to an SUSE Manager service offering.

WARNING

Customers with Expanded Support using SUSE Manager must be entitled to retrieve updates to their Red Hat Enterprise Linux system via Novell Customer Center. Installing the Red Hat GPG key is also required. For more information, refer to the section called “Installing the Red Hat GPG key” (page 30).

1.3.1 Starting the Red Hat Update Agent

If you are not running the X Window System or prefer the command line version of the Red Hat Update Agent, skip to Section 1.3.3, “Command Line Version” (page 25).

You must be root to run the Red Hat Update Agent. If started as a standard user, Red Hat Update Agent prompts you to enter the root password before proceeding. The Red Hat Update Agent can be started as follows:

- For Red Hat Enterprise Linux 5: At a shell prompt (for example, an xterm or gnome-terminal), type the command `system-config-packages`.

- For Red Hat Enterprise Linux 4: At a shell prompt (for example, an xterm or gnome-terminal), type the command `up2date`.

If you start the application from a shell prompt, you can specify the options in Table 1.1, “Graphical Update Agent Options” (page 21). To view these options, type the command `up2date --help`. For example, use the following command to specify the directory in which to download the updated packages (temporarily overriding your saved configuration):

```
up2date --tmpdir=/tmp/up2date/
```

Table 1.1 *Graphical Update Agent Options*

Option	Description
`--configure`	Configure Red Hat Update Agent options. Refer to Section 1.3.4, “Configuration” (page 32) for detailed instructions.
`-d`, `--download`	Download packages only; do not install them. This argument temporarily overrides the configuration option *Do not install packages after retrieval.* Use this option if you prefer to install the packages manually.
`-f`, `--force`	Force package installation. This option temporarily overrides the file, package, and configuration skip lists.
`-i`, `--install`	Install packages after they are downloaded. This argument temporarily overrides the configuration option *Do not install packages after retrieval.*
`-k`, `--packagedir`	Specify a colon separated path of directories in which to look for packages before trying to download them.
`--nosig`	Do not use GPG to check package signatures. This option temporarily overrides the saved configuration option.

Option	Description
`--tmpdir=`*`directory`*	Temporarily override the configured package directory. The default location is `/var/spool/up2date`. This option is useful if you do not have enough space in the configured location.
`--dbpath=`*`dir`*	Specify an alternate RPM database to use temporarily.

The first time you run the Red Hat Update Agent, two dialog boxes appear that you will not see in subsequent startups: *Configure Proxy Server* and *Install GPG Key*.

The first dialog box to appear prompts you for HTTP Proxy Server information. This is useful if your network connection requires you to use a proxy server to make HTTP connections. To use this feature, select the *Enable HTTP Proxy* checkbox and type your proxy server in the text field with the format HOST:PORT, such as **`squid.mysite.org:3128`**. Additionally, if your proxy server requires a username and password, select the *Use Authentication* checkbox and enter your username and password in the respective text fields.

An HTTP Proxy Server is not required by SUSE Manager. If you do not want to use this feature, click the OK button without making any selections.

The second dialog box to appear prompts you to install the Red Hat GPG key. This key is used to verify the packages you download for security purposes. Click Yes to install the key, and you will not see this message again.

1.3.2 Registration

Before you begin using SUSE Manager, you must create a username, password, and System Profile. Upon launch, the Red Hat Update Agent senses whether these tasks have been accomplished. If not, it guides you through the registration process.

If you ever need to force the Red Hat Update Agent into registration mode, such as to re-register an existing system, you may do so by issuing the following command at a shell prompt:

```
up2date --register
```

IMPORTANT

If your username is part of a larger organizational account, you should take caution when registering systems. By default, all systems registered with the Red Hat Update Agent end up in the Ungrouped section of systems visible only to SUSE Manager Administrators. To ensure you retain management of these systems, your organization is recommended to create an activation key associated with a specific system group and grant you permissions to that group. You may then register your systems using that activation key and find those System Profiles within SUSE Manager immediately. Refer to Section 1.3.5, “Registering with Activation Keys” (page 37) for instructions.

After installing the Red Hat GPG Key, the Welcome screen appears. It appears each time you start the Red Hat Update Agent. Click Forward to continue.

Channels

Red Hat Update Agent next displays all package channels to which you have access. The channels you select from this screen must match the base operating system of the system you are registering. if any child channels are available, you may select them as well. Additional information regarding the selected channel is displayed in the *Channel Information* pane. When finished, click Forward to continue.

Red Hat Update Agent now compares the packages in your RPM database with those available from the Channel you selected. The progress bar is displayed during this process.

Packages Flagged to be Skipped

The next step in the initial update is the selection of files to be skipped. Any packages checked here will not be downloaded and updated by the Red Hat Update Agent. This screen is displayed whenever packages are available that are currently selected to be ignored.

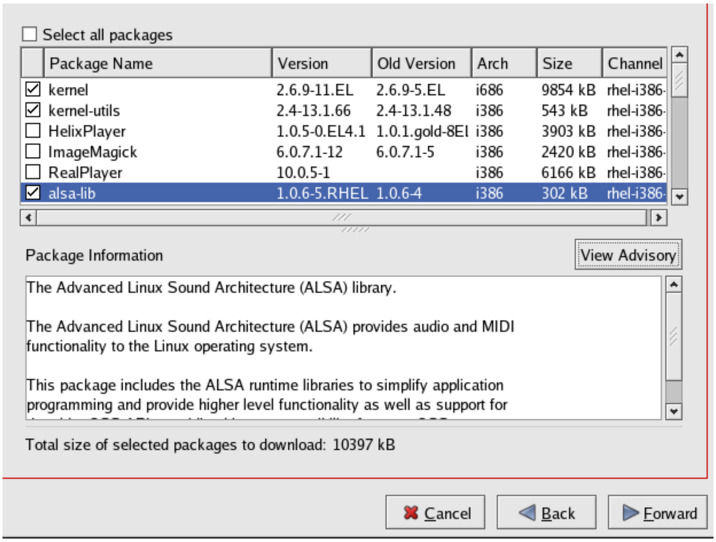
Make your selections and click Forward to continue.

Available Package Updates

The Red Hat Update Agent next displays all available updates except those you chose to skip in the previous screen. Select those you wish to download and click Forward to continue. To view the complete Patch (Errata) Advisory text for an update, highlight the relevant package and click the View Advisory button. When finished, click OK.

Select those you wish to download and click Forward to continue.

Figure 1.8 *Available Package Updates*



□ Select all packages

	Package Name	Version	Old Version	Arch	Size	Channel
☑	kernel	2.6.9-11.EL	2.6.9-5.EL	i686	9854 kB	rhel-i386-
☑	kernel-utils	2.4-13.1.66	2.4-13.1.48	i386	543 kB	rhel-i386-
□	HelixPlayer	1.0.5-0.EL4.1	1.0.1.gold-8EI	i386	3903 kB	rhel-i386-
□	ImageMagick	6.0.7.1-12	6.0.7.1-5	i386	2420 kB	rhel-i386-
□	RealPlayer	10.0.5-1		i386	6166 kB	rhel-i386-
☑	alsa-lib	1.0.6-5.RHEL	1.0.6-4	i386	302 kB	rhel-i386-

Package Information

The Advanced Linux Sound Architecture (ALSA) library.

The Advanced Linux Sound Architecture (ALSA) provides audio and MIDI functionality to the Linux operating system.

This package includes the ALSA runtime libraries to simplify application programming and provide higher level functionality as well as support for

Total size of selected packages to download: 10397 kB

Retrieving Packages

The Red Hat Update Agent tests the packages you selected to be certain that the requirements of each RPM are met. If any additional packages are required, Red Hat Update Agent displays an error message. Click OK to continue.

Once all dependencies are met, Red Hat Update Agent retrieves the packages from SUSE Manager. As the packages are downloaded, they are temporarily stored in `/var/spool/up2date/`.

When all packages have been downloaded, click Forward to continue.

Installing Packages

The packages must be installed after downloading them via the Red Hat Update Agent. If you chose not to install the packages via the Red Hat Update Agent, skip to the section called “Manual Package Installation” (page 30) for further instructions. If you configured the Red Hat Update Agent to install the packages (the default setting), the installation process begins. The progress of installing each package, as well as the total progress, is displayed. When the packages have been installed, click Forward to continue.

Click Finish to exit the Red Hat Update Agent.

1.3.3 Command Line Version

If you are not running X, you can still run the Red Hat Update Agent from a virtual console or remote terminal. If you are running X but want to use the command line version, you can force it not to display the graphical interface with the following command:

```
up2date --nox
```

The command line version of the Red Hat Update Agent allows you to perform advanced functions or to perform actions with little or no interaction. For example, the following command updates your system with no interaction. It downloads the newer packages and installs them if you configured it to do so.

```
up2date -u
```

The command line version of the Red Hat Update Agent accepts the following arguments:

***Table 1.2** Update Agent Command Line Arguments*

Option	Description
`-?`, `--usage`	Briefly describe the available options.
`-h`, `--help`	List the available options and exit.

Option	Description
`--arch=`*`architecture`*	Force `up2date` to install this architecture of the package. Not valid with `--update`, `--list`, or `--dry-run`.
`--channel=`*`channel`*	Specify from which channels to update using channel labels.
`--configure`	Configure Red Hat Update Agent options. Refer to Section 1.3.4, “Configuration” (page 32) for detailed instructions.
`-d`, `--download`	Download packages only; do not install them. This argument temporarily overrides the configuration option *Do not install packages after retrieval*. Use this option if you prefer to install the packages manually.
`--dbpath=`*`dir`*	Specify an alternate RPM database to use temporarily.
`--dry-run`	Do everything but download and install packages. This is useful in checking dependencies and other requirements prior to actual installation.
`-f`, `--force`	Force package installation. This option temporarily overrides the file, package, and configuration skip lists.
`--firstboot`	Pop up in the center of the screen for Firstboot.
`--get`	Fetch the package specified without resolving dependencies.

Option	Description
`--get-source`	Fetch the source package specified without resolving dependencies.
`--gpg-flags`	Show the flags with which GPG is invoked, such as the keyring.
`--hardware`	Update this system's hardware profile on SUSE Manager.
`-i`, `--install`	Install packages after they are downloaded. This argument temporarily overrides the configuration option *Do not install packages after retrieval.*
`--installall=`*`<channel-label>`*	Install all available packages from a given channel
`--justdb`	Only add packages to the database and do not install them.
`-k`, `--packagedir`	Specify a colon-separated path of directories in which to look for packages before trying to download them.
`-l`, `--list`	List packages relevant to the system.
`--list-rollbacks`	Show the package rollbacks available.
`--nodownload`	Do not download packages at all. This is useful in testing.
`--nosig`	Do not use GPG to check package signatures. This option temporarily overrides the saved configuration option.
`--nosrc`	Do not download source packages (SRPMs).

Option	Description
`--nox`	Do not attempt to run in X. This launches the command line version of the Red Hat Update Agent.
`-p`, `--packages`	Update packages associated with this System Profile.
`--proxy=`*`proxy URL`*	Specify an HTTP proxy to use.
`--proxyPassword=`*`proxy password`*	Specify a password to use with an authenticated HTTP proxy.
`--proxyUser=`*`proxy user ID`*	Specify a username to use with an authenticated HTTP proxy.
`--register`	Register (or re-register) this system with SUSE Manager. Refer to Section 1.3.2, “Registration” (page 22) for detailed instructions.
`--serverUrl=`*`server URL`*	Specify an alternate server from which to retrieve packages.
`--showall`	List all packages available for download.
`--show-available`	List all packages available that are not currently installed.
`--show-channels`	Show the channel name associated with each package.
`--show-orphans`	List all packages currently installed that are not in channels to which the system is subscribed.

Option	Description
`--show-package-dialog`	Show the package installation dialog in GUI mode.
`--solvedeps=`*`dependencies`*	Find, download, and install the packages necessary to resolve dependencies.
`--src`	Download source packages, as well as binary RPMs.
`--tmpdir=`*`directory`*	Temporarily override the configured package directory. The default location is `/var/spool/up2date`. This option is useful if you do not have enough space in the configured location.
`-u`, `--update`	Update system with all relevant packages.
`--undo`	Reverse the last package set update.
`--upgrade-to-release=`*`release version`*	Upgrade to the channel specified.
`--uuid=`*`uuid`*	Pass in a Unique User ID generated by the Alert Notification tool.
`-v`, `--verbose`	Show additional output while updating.
`--version`	Show `up2date` version information.
`--whatprovides=`*`dependencies`*	Show the packages that resolve the comma-separated list of dependencies.

NOTE

The `--solvedeps` and `--whatprovides` options can be used to solve the dependencies for an RPM regardless even if your system does not currently have access to a channel that contains that package.

Installing the Red Hat GPG key

The first time you run the graphical version of the Red Hat Update Agent, it prompts you to install the Red Hat GPG key. This key is required to authenticate the packages downloaded from Red Hat Network. If you run the command line version the first time you start Red Hat Update Agent, you must install the Red Hat GPG key manually. If you do not have it installed, you will see the following message:

```
Your GPG keyring does not contain the Red Hat, Inc. public key.
Without it, you will be unable to verify that packages Update Agent downloads
are securely signed by Red Hat.

[...]
```

NOTE

GPG keys must be installed for each user. To install the key to use with SUSE Manager, import the key while logged in as root.

Issue the following command at a shell prompt as root:

```
rpm --import /usr/share/rhn/RPM-GPG-KEY
```

Manual Package Installation

If you chose to download, but not install, the software updates with the Red Hat Update Agent, you must install them manually using RPM.

To install them, change to the directory that contains the downloaded packages. The default directory is `/var/spool/up2date`. Type the command `rpm -Uvh *.rpm`. When the packages finish installing, you can delete them if you wish. You do not need them anymore.

After installing the packages, you must update your System Profile so that you are not prompted to download them again. Refer to the section called “Synchronizing Your System Profile” (page 31) for details.

Synchronizing Your System Profile

If you configured the Red Hat Update Agent to install the latest packages, the System Profile stored by SUSE Manager is updated after the packages are installed. However, if you only download the latest RPM packages using the Red Hat Update Agent, download the RPM packages from the website, or upgrade/install/remove RPM packages yourself, your System Profile is not updated automatically. You must send your updated System Profile to the SUSE Manager server.

To synchronize the RPM package list on your local Red Hat Enterprise Linux 5 system and on Red Hat Network, run the command:

```
rhn-profile-sync
```

After running this command, your SUSE Manager System Profile reflects the latest software versions installed on your system.

For Red Hat Enterprise Linux 4 systems, use the following command to update the package list, run the command:

```
up2date -p
```

Log File

The Red Hat Update Agent keeps a log of all the actions that it performs on your system in the file `/var/log/up2date`. It uses the standard rotating log method. Thus, older logs are in `/var/log/up2date.1`, `/var/log/up2date.2`, and `/var/log/up2date.3`. The log files store actions performed by the Red Hat Update Agent such as when your RPM database is opened, when it connects to SUSE Manager to retrieve information from your System Profile, which packages are downloaded, which packages are installed using the Red Hat Update Agent, and which packages are deleted from your system after installation. If you choose to install and delete packages yourself, it is not logged in this file. It is recommended that you keep a log of actions not performed with the Red Hat Update Agent.

1.3.4 Configuration

The Red Hat Update Agent offers various options to configure its settings.

If you are not running the X Window System or prefer the command line version, skip to the section called "Command Line Version" (page 35).

Using the Red Hat Update Agent Configuration Tool

You must be root to run the Red Hat Update Agent Configuration Tool. If started by a user other than root, the Red Hat Update Agent prompts you for the root password. The Red Hat Update Agent Configuration Tool can be started by typing the command `up2date --config` at a shell prompt (for example, an xterm or a gnome-terminal).

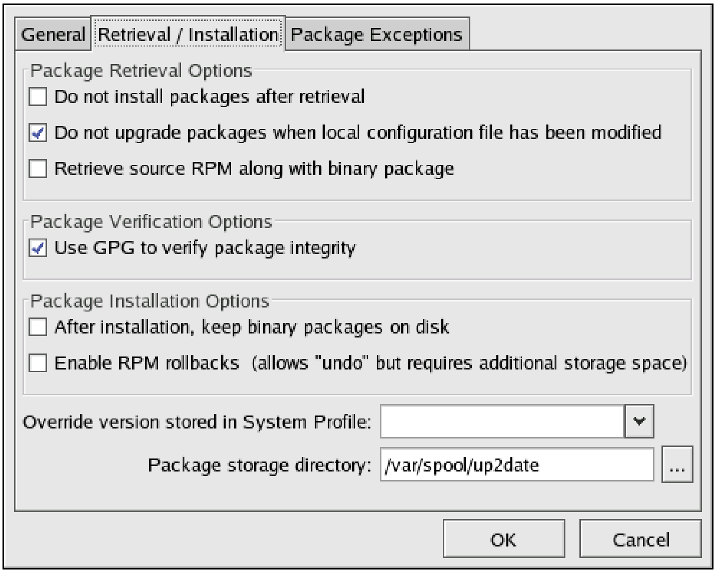
General Settings

The *General* tab allows you to enable an HTTP Proxy Server. If your network connection requires you to use an HTTP Proxy Server to make HTTP connections, select the *Enable HTTP Proxy* option and type your proxy server in the text field with the format http://HOST:PORT. For example, to use the proxy server squid.mysite.org on port 3128, you would enter **`squid.mysite.org:3128`** in the text field. Additionally, if your proxy server requires a username and password, select the *Use Authentication* option and enter your username and password in the respective text fields.

Retrieval/Installation Settings

The *Retrieval/Installation* tab allows you to customize your software package retrieval and package installation preferences.

Figure 1.9 *Retrieval/Installation Settings*



Package Retrieval Options

□ Do not install packages after retrieval

☑ Do not upgrade packages when local configuration file has been modified

□ Retrieve source RPM along with binary package

Package Verification Options

☑ Use GPG to verify package integrity

Package Installation Options

□ After installation, keep binary packages on disk

□ Enable RPM rollbacks (allows "undo" but requires additional storage space)

Override version stored in System Profile:

Package storage directory: /var/spool/up2date

The following package retrieval options can be selected (see Figure 1.9, “Retrieval/Installation Settings” (page 33)):

- Do not install packages after retrieval — download selected RPM packages to the desired directory and ignore the installation preferences

- Do not upgrade packages when local configuration file has been modified — if the configuration file has been modified for a package such as `apache` or `squid`, do not attempt to upgrade it. This option is useful if you are installing custom RPMs on your system and you do not want them updated or reverted to the default Red Hat Enterprise Linux packages.

- Retrieve source RPM along with binary package — download both the source (`*.src.rpm`) and the binary (`*.[architecture].rpm`) files

The following installation options are configurable (see Figure 1.9, “Retrieval/Installation Settings” (page 33)):

- Use GPG to verify package integrity — before installing packages, verify Red Hat's GPG signature (highly recommended for security reasons)

- After installation, keep binary packages on disk — save binary packages in the desired directory instead of deleting them after installation

The following additional options are configurable from this tab:

- Override version stored in System Profile — override the Red Hat Linux version in your System Profile

- Package storage directory — change the directory where packages are downloaded; the default location is `/var/spool/up2date/`

Package Exceptions Settings

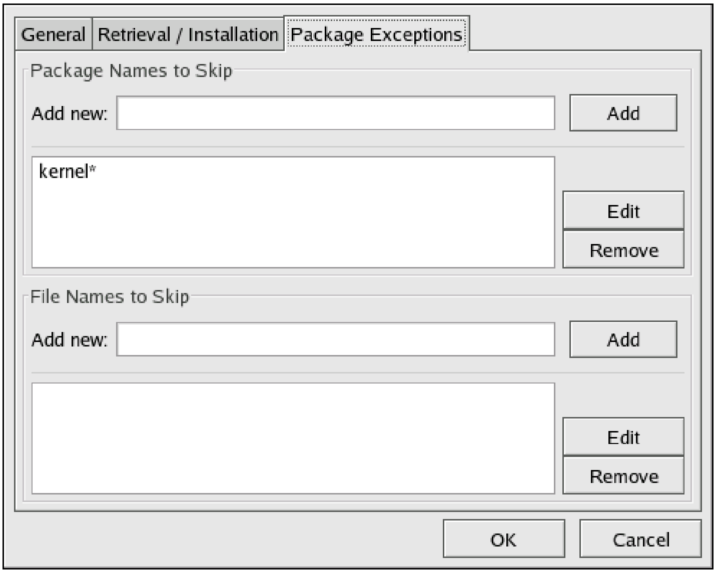
The *Package Exceptions* tab allows you to define which packages to exclude from the list of updated RPM packages according to the package name or file name (see Figure 1.10, "Package Exceptions Settings" (page 35)).

To define a set of packages to be excluded according to the package name, enter a character string including wild cards (*) in the *Add new* text field under in the *Package Names to Skip* section heading. A wild card at the end of the character string indicates that all packages beginning with the character string are excluded from the list. A wild card at the beginning of the character string indicates that any packages that end with the character string are excluded from the list.

For example, if the string **`kernel*`** is in the *Package Names to Skip* section, the Red Hat Update Agent will not display any packages beginning with kernel.

To exclude packages by file name, apply the same rules to the field below *File Names to Skip* section heading.

Figure 1.10 *Package Exceptions Settings*



kernel*

Command Line Version

The command line version of this tool performs the same function as the graphical version. It allows you to configure the settings used by the Red Hat Update Agent and store them in the configuration file `/etc/sysconfig/rhn/up2date`.

To run the command line version of the Red Hat Update Agent Configuration Tool, use the following command:

```
up2date --nox --configure
```

You are presented with a list of options and their current values:

```
0.  adminAddress       ['root@localhost']
1.  debug              No
2.  disallowConfChange ['noReboot', 'sslCACert', 'useNoSSLForPackages',
3.  enableProxy        No
4.  enableProxyAuth    No
5.  enableRollbacks    No
6.  fileSkipList       []
7.  forceInstall       No
8.  gpgKeyRing         /etc/sysconfig/rhn/up2date-keyring.gpg
9.  headerCacheSize    40
10. headerFetchCount   10
```

```
11. httpProxy
12. isatty             Yes
13. keepAfterInstall   No
14. networkRetries     5
15. noBootLoader       No
16. noReboot           No
17. noReplaceConfig    Yes
18. noSSLServerURL     http://xmlrpc.rhn.redhat.com/XMLRPC
19. pkgSkipList        ['kernel*']
20. pkgsToInstallNotUp ['kernel', 'kernel-modules', 'kernel-devel']
21. proxyPassword
22. proxyUser
23. removeSkipList     ['kernel*']
24. retrieveOnly       No
25. retrieveSource     No
26. rhnuuid            a8aea05c-f174-11df-af94-55bad1b1e05f
27. serverURL          http://ix64ph001.example.com/XMLRPC
28. showAvailablePacka No
29. sslCACert          /usr/share/rhn/RHNS-CA-CERT
30. storageDir         /var/spool/up2date
31. systemIdPath       /etc/sysconfig/rhn/systemid
32. updateUp2date      Yes
33. useGPG             Yes
34. useNoSSLForPackage No
35. useRhn             Yes
36. versionOverride

Enter number of item to edit <return to exit, q to quit without saving>:
```

Enter the number of the item to modify and enter a new value for the option. When you finish changing your configuration, press Enter to save your changes and exit. Press q and then Enter to quit without saving your changes.

IMPORTANT

Although this is not configurable, users should still make note that the port used by the Red Hat Update Agent is 443 for SSL (HTTPS) and 80 for non-SSL (HTTP). By default, `up2date` uses SSL only. For this reason, users should ensure that their firewalls allow connections over port 443. To bypass SSL, change the protocol for serverURL from **`https`** to **`http`** in the `/etc/sysconfig/rhn/up2date` configuration file.

1.3.5 Registering with Activation Keys

In addition to the standard Red Hat Update Agent interface, `up2date` offers a utility aimed at batch processing system registrations: activation keys. Each unique key can be used to register Red Hat Enterprise Linux systems, entitle them to a SUSE Manager service level, and subscribe them to specific channels and system groups, all in one action.

Alternatively, both the Red Hat Network Registration Client and Red Hat Update Agent offer the activation keys utility `rhnreg_ks` as part of their packages.

Before using an activation key you must first generate one through the SUSE Manager website. Refer to Section 3.4.6, “Activation Keys — [Mgmt]” (page 94) for precise steps.

To use an activation key, run the following command as root from a shell prompt on the system to be registered:

```
rhnreg_ks --activationkey=7202f3b7d218cf59b764f9f6e9fa281b
```

The precise value of the activation key varies.

In addition, Provisioning-entitled systems may use multiple activation keys at once, either at the command line or within kickstart profiles. This allows Administrators to include a variety of values without creating a special key for the desired results. To do this, specify the keys separated by commas, like this:

```
rhnreg_ks --activationkey=7202f3b7d218cf59b764f9f6e9fa281b,\
39f41081f0329c20798876f37cb9p6a3
```

NOTE

The trailing backslash (\) in this command example is a continuation character; it may safely be omitted, if you write all keys in one line.

Refer to the section called “Using Multiple Activation Keys at Once — [Prov]” (page 97) to understand how differences in activation keys are handled.

The above command performs all the actions of the Registration Client and the registration function of the Red Hat Update Agent. Do not run either of these applications for registration after running `rhnreg_ks`.

A System Profile, including software and hardware information, is created for the system and sent to the SUSE Manager server along with the unique activation key. The system is registered with SUSE Manager under the account used to generate the key, entitled to an SUSE Manager service offering, and subscribed to the Novell channels and system groups selected during key generation. The system is not subscribed to channels that contain packages unsuitable for the system. For example, a Red Hat Enterprise Linux 4 system cannot be subscribed to the Red Hat Enterprise Linux 5 channel.

The unique Digital Certificate for the system is generated on the system in the file `/etc/sysconfig/rhn/systemid`.

When using activation keys to assign channels, consider these rules:

- A key may specify either zero or one base channel. If specified, it must be a custom base channel. If not, the base channel corresponding to the system's Red Hat distribution is chosen. For instance, you may not subscribe a Red Hat Enterprise Linux 4 system to the Red Hat Enterprise Linux 5 channel.

- A key may specify any number of child channels. For each child channel, subscription is attempted. If the child channel matches the system's base channel, subscription succeeds. If it does not, the subscription fails silently. Refer to Section 3.6, “Channels” (page 126) for more information.

- Keys may be modified by any user with the role of Activation Key Administrator or SUSE Manager Administrator (or both). These permissions are set through the *Users* tab of the SUSE Manager website. Refer to Section 3.9, “Users — [Mgmt]” (page 146) for details.

- Systems registered with activation keys are tied to the organization account in which the key was created, not the key itself. After registration, a key can be deleted safely without any effect on the systems it was used to register.

1.3.6 Registering a System to an Organization

SUSE Manager supports the Organizations feature, which allows administrators to appropriate software and system entitlements across various organizations, as well as control an organization's access to systems management. Systems can now be registered directly with an organization.

To register a system with an organization on a SUSE Manager server, you can use the username and password of an account that is created within that organization. For example, if there is an organization called *Sales Team*, with a username **`salesadmin`** and password **`abc123`**, using these credentials assures that a system is registered with the proper organization.

For example:

```
rhnreg_ks --user=salesadmin --password=abc123
```

IMPORTANT

The `--orgid` option (for RHEL 4 and 5) and the `--orgpassword` option (in RHEL 4) in the `rhnreg_ks` command *are not related* to the Organizations feature and should not be used in the context of registering systems with organizations.

For more information about the Organizations feature, refer to Section 3.11.1, “*Admin > Organizations*” (page 161).

2 SUSE Manager Daemon

The SUSE Manager daemon (rhnsd) runs on the client systems and periodically connects to SUSE Manager to check for updates and notifications. The daemon, which runs in the background, is typically started from the rcrhnsd initialization script.

To check for updates, rhnsd runs the external mgr_check program located in /usr/sbin/. This is a small application that makes the network connection to SUSE Manager. The SUSE Manager daemon does not listen on any network ports or talk to the network directly. All network activity is done via the mgr_check utility.

2.1 Configuring

The SUSE Manager daemon can be configured by editing the /etc/sysconfig/rhn/rhnsd configuration file. This is actually the configuration file the rhnsd initialization script uses. The most important setting offered by the daemon is its check-in frequency. The default interval time is four hours (240 minutes). If you modify the configuration file, you must (as root) restart the daemon with the command rcrhnsd restart.

IMPORTANT

The minimum time interval allowed is one hour (60 minutes). If you set the interval below one hour, it will default to four hours (240 minutes).

2.2 Viewing Status

You can view the status of the rhnsd by typing the command `rcrhnsd status` at a shell prompt.

2.3 Disabling Service

To disable the daemon, (as root) run the command `chkconfig rhnsd off`. Using this method only disables the service the next time the system is started. To stop the service immediately, use the command `rcrhnsd stop`.

2.4 Troubleshooting

If you see messages indicating that checkins are not taking place, the client on your system is not successfully reaching SUSE Manager. Make sure:

- your client is configured correctly.
- your system can communicate with SUSE Manager via SSL (port 443). You may test this by running the following command from a shell prompt:

  ```
  telnet xmlrpc.example.com 443
  ```

- the SUSE Manager daemon is activated and running. You may ensure this by running the following commands:

  ```
  chkconfig --level 345 rhnsd on
  rcrhnsd start
  ```

  If these are correct and your systems still indicate they are not checking in, please contact our technical support team.

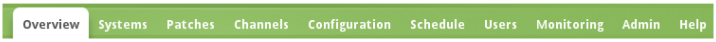
SUSE Manager Web Interface 3

Use the SUSE Manager Web interface to manage multiple SUSE Linux Enterprise and Red Hat Enterprise Linux systems simultaneously, including viewing alerts, applying updates, patches and security fixes, and installing software packages. This chapter seeks to identify all categories, pages, and tabs within the Web interface and to explain how to use them.

3.1 Navigation

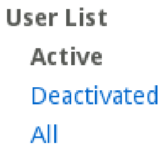
The top navigation bar is divided into tabs. SUSE Manager Administrators see Figure 3.1, "Top Navigation Bar—SUSE Manager" (page 43) as the top navigation bar. Note that only SUSE Manager Administrators see the *Monitoring* and *Admin* tabs.

Figure 3.1 *Top Navigation Bar—SUSE Manager*



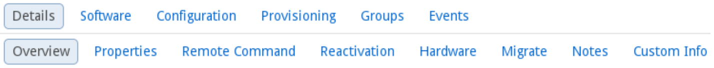
The left navigation bar is divided into pages. The links are context-sensitive . The Figure 3.2, "Left Navigation Bar—Users" (page 44) is an example of the left navigation bar for the *Users* tab.

Figure 3.2 *Left Navigation Bar—Users*



Some pages have subtabs. These tabs offer an additional layer of granularity in performing tasks for systems or users. Figure 3.3, “Subtabs—System Details” (page 44) is a menu bar for all *System Details* subtabs. This system has Management and Provisioning entitlements, but not Monitoring.

Figure 3.3 *Subtabs—System Details*



3.1.1 Entitlement Views

Keep in mind, since this guide covers all entitlement levels, some tabs, pages, and even whole categories described here may not be visible to you. For this reason, textual markers are used here to identify, which functions are available to each entitlement level.

Table 3.1 *Entitlement Markers*

Marker	Entitlement
[Mgmt]	Management or higher
[Prov]	Provisioning
[Mon]	Monitoring

If no marker follows a category, page, or tab label within this chapter, the area described is available to all SUSE Manager users. If a marker does follow, the associated entitlement is needed. Remember that Provisioning inherits all of the functions of Management.

If a marker precedes a paragraph, only the specific portion of the page or tab discussed afterward requires the indicated entitlement level. When a page or tab is associated with a particular entitlement level, all of its tabs and subtabs require at least the same entitlement level but may need a higher entitlement. Regardless, each tab is identified separately.

3.1.2 Categories and Pages

This section summarizes all of the categories and primary pages (those linked from the top and left navigation bars) within the SUSE Manager Web interface. It does not list the many subpages, tabs and subtabs accessible from the left navigation bar and individual pages. Each area of the website is explained in detail later in this chapter:

- *Overview* — View and manage your primary account information and obtain help.

  - *Overview* — Obtain a quick overview of your account. It notifies you if your systems need attention, provides a quick link to go directly to them, and displays the most recent patch alerts for your account.

  - *Your Account* — Update your personal profile and addresses.

  - *Your Preferences* — Indicate if you wish to receive email notifications about available patches for your systems, set how many items are displayed at one time for lists such as system lists and system group lists, set your time zone, and identify your contact options.

  - *Subscription Management* — Manage base and add-on system entitlements, such as Management, Provisioning, and Virtualization.

  - *Organization Trusts* — Display the trusts established with your organization.

- *Systems* — Manage all of your systems (including virtual guest systems) here.

  - *Overview* — [Mgmt] — View a summary of your systems or system groups showing how many available patches each system has and which systems are entitled.

  - *Systems* — Select and view subsets of your systems by specific criteria, such as Virtual Systems, Unentitled, Recently Registered, Proxy, and Inactive.

    - *System Groups* — [Mgmt] — List your system groups. Create additional groups.
    - *System Set Manager* — [Mgmt] — Perform various actions on collective sets of systems, including scheduling patch updates, package management, listing and creating new groups, and managing channel entitlements.
    - *Advanced Search* — [Mgmt] — Quickly search all of your systems by specific criteria, such as name, hardware, devices, system info, networking, packages, and location.
    - *Activation Keys* — [Mgmt] — Generate an activation key for an SUSE Manager-entitled system. This activation key can be used to grant a specified level of entitlement or group membership to a newly registered system using the `rhnreg_ks` command.
    - *Stored Profiles* — [Prov] — View system profiles used to provision systems.
    - *Custom System Info* — [Prov] — Create and edit system information keys containing completely customizable values that can be assigned while provisioning systems.
    - *Autoinstallation* — [Prov] — Display and modify various aspects of autoinstallation profiles (Kickstart and AutoYaST) used in provisioning systems.
- *Patches* — View and manage patch (errata) alerts here.
    - *Patches* — Lists patch (errata) slerts and download associated RPMs.
    - *Advanced Search* — Search patch (errata) alerts based on specific criteria, such as synopsis, advisory type, and package name.
    - *Manage Patches* — Manage the patches (errata) for an organization's channels.
    - *Clone Patches* — Clone patches (errata) for an organization for ease of replication and distribution across an organization.
- *Channels* — View and manage the available SUSE Manager channels and the files they contain.
    - *Software Channels* — View a list of all software channels and those applicable to your systems.

    - *Package Search* — Search packages using all or some portion of the package name, description, or summary, with support for limiting searches to supported platforms.

    - *Manage Software Channels* — [Prov] — Create and edit channels used to deploy configuration files.

- *Configuration* — Keep track of and manage configuration channels, actions, and individual configuration files.

    - *Overview* — A general dashboard view that shows a configuration summary.

    - *Configuration Channels* — List and create configuration channels from which any subscribed system can receive configuration files.

    - *Configuration Files* — List and create files from which systems receive configuration input.

    - *Systems* — List the systems that have SUSE Manager-managed configuration files.

- *Schedule* — Keep track of your scheduled actions.

    - *Pending Actions* — List scheduled actions that have not been completed.

    - *Failed Actions* — List scheduled actions that have failed.

    - *Completed Actions* — List scheduled actions that have been completed. Completed actions can be archived at any time.

    - *Archived Actions* — List completed actions that have been selected to archive.

- *Users* — [Prov] — View and manage users for your organization.

    - *User List* — [Prov] — List users for your organization.

- *Monitoring* — [Mon] — Run probes and receive notifications regarding systems.

    - *Status* — [Mon] — View probes by state.

    - *Scout Config Push* — [Mon] — Display the status of your monitoring infrastructure.

    - *Notification* — [Mon] — View contact methods established for your organization.

    - *Probe Suites* — [Mon] — Manage your monitoring infrastructure using suites of monitoring probes that apply to one or more assigned systems.

- *Admin* (visible only to SUSE Manager administrators) — List, create, and manage one or more SUSE Manager organizations, from which the SUSE Manager administrator can assign channel entitlements, create and assign administrators for each organization, and other tasks.

    - *Organizations* — List and create new organizations.

    - *Subscriptions* — List and manage the software and system entitlements for all organizations covered by SUSE Manager.

    - *Users* — List all users known by SUSE Manager, across all organizations. Click individual usernames to change administrative privileges for the user.

        > **NOTE**
        >
        > Users created for organization administration can only be configured by the organization administrator, *not* the SUSE Manager administrator.

    - *SUSE Manager Configuration* — Make General configuration changes to the SUSE Manager server, including Proxy settings, Certificate configuration, Bootstrap Script configuration, Organization changes, and Restart the SUSE Manager server.

    - *Show Tomcat Logs* — Display the log entries of the Tomcat server, on which the SUSE Manager server is running.

- *Help* — List references to available help resources.

3.1.3 Patch Alert Icons

Throughout SUSE Manager you will see three patch (errata) alert icons. 🛡 represents a security alert. 🐞 represents a bug fix alert. 🟩 represents an enhancement alert.

In the *Overview* page, click on the patch advisory to view details about the patch or click on the number of affected systems to see which are affected by the patch alert. Both links take you to tabs of the *Patch Details* page. Refer to the section called “Patch Details” (page 123) for more information.

3.1.4 Quick Search

In addition to the Advanced Search functionality for Packages, Patches (Errata), Documentation, and Systems offered within some categories, SUSE Manager also offers a Quick Search tool near the the top of each page. To use it, select the search item (choose from *Systems*, *Packages*, *Documentation*, and *Patches*) and type a keyword to look for a name match. Click the Search button. Your results appear at the bottom of the page.

If you misspell a word during your search query, the SUSE Manager search engine institutes *approximate string* (or *fuzzy string*) matching, giving you results that may be similar in spelling to your misspelled queries.

For example, if you want to search for a certain development system called **`test-1.example.com`** that is registered with SUSE Manager, but you misspell your query **`tset`**, the `test-1.example.com` system still appears in the search results.

NOTE

If you add a distribution or register a system with a SUSE Manager server, it may take several minutes for it to be indexed and appear in search results.

- For advanced System searches, refer to Section 3.4.5, “Advanced Search — [Mgmt]” (page 91).

- For advanced Patch or Errata searches, refer to Section 3.5.3, “Advanced Search” (page 124).

- For advanced Package searches, refer to Section 3.6.2, “Package Search” (page 131).

- For advanced Documentation searches, refer to Section 3.12.5, “Search” (page 164).

3.1.5 Systems Selected

Also near the top of the page is a tool for keeping track of the systems you have selected for use in the System Set Manager. It identifies the number of selected systems at all times and provides the means to work with them. Clicking the Clear button deselects all systems, while clicking the Manage button launches the System Set Manager with your selected systems in place.

These systems can be selected in a number of ways. Only systems with at least a Management entitlement are eligible for selection. On all system and system group lists, a Select column exists for this purpose. Select the checkboxes next to the systems or groups and click the Update List button below the column. Each time, the Systems Selected tool at the top of the page changes to reflect the new number of systems ready for use in the System Set Manager. Refer to Section 3.4.4, "*System Set Manager — [Mgmt]*" (page 83) for details.

3.1.6 Lists

The information within most categories is presented as lists. These lists have some common features for navigation. For instance, you can navigate through virtually all lists by clicking the back and next arrows above and below the right side of the table. Some lists also offer the ability to retrieve items alphabetically by clicking the letters above the table.

NOTE: Performing Large List Operations

Performing operations on large lists— such as removing RPM packages from the database with the SUSE Manager Web interface— may take some time and the system may become unresponsive or signal "Internal Server Error 500". Nevertheless, the command will succeed in the background, if you wait long enough.

3.2 Getting your Novell Customer Center Mirror Credentials

Use a Web browser to navigate to `http://novell.com/center` to display the Novell Customer Center (NCC) login page. You need to log in and view your mirror credentials to see all your entitlements for your registered systems. If you have not registered a system yet or do not have a Novell account, create a new account by following the *Create Account* link. After creating a new user account, you must register a system before using SUSE Manager. On the Web page, click *My Products* > *Mirror Credentials* to get your channels for your Novell products. For detailed information about the NCC, refer to the NCC guide available at `http://www.novell.com/documentation/ncc`.

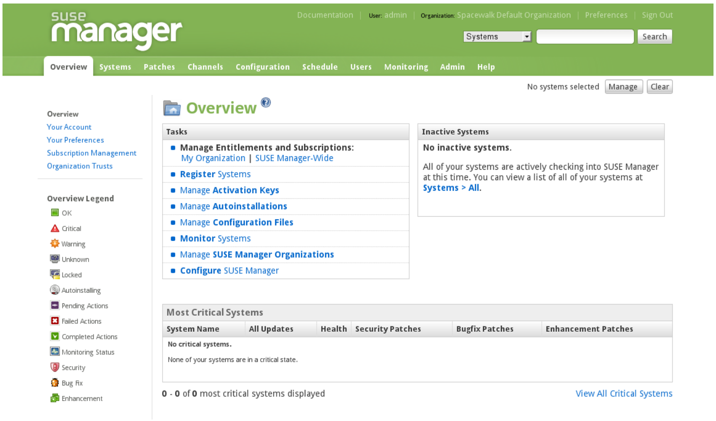
3.3 Overview

After logging into the web interface of SUSE Manager, the first page to appear is *Overview*. This page contains important information about your systems, including summaries of system status, actions, and patch alerts.

NOTE

If you are new to the SUSE Manager Web interface, read Section 3.1, “Navigation” (page 43) to become familiar with the layout and symbols used throughout the interface.

Figure 3.4 *Overview*



Overview

Tasks

- Manage Entitlements and Subscriptions: My Organization | SUSE Manager-Wide
- Register Systems
- Manage Activation Keys
- Manage Autoinstallations
- Manage Configuration Files
- Monitor Systems
- Manage SUSE Manager Organizations
- Configure SUSE Manager

Inactive Systems

No inactive systems.

All of your systems are actively checking into SUSE Manager at this time. You can view a list of all of your systems at Systems > All.

Most Critical Systems

System Name	All Updates	Health	Security Patches	Bugfix Patches	Enhancement Patches
No critical systems. None of your systems are in a critical state.					

0 - 0 of 0 most critical systems displayed

View All Critical Systems

This page is broken into functional areas, with the most critical areas displayed first. Users can control which of the following areas are displayed by making selections on the *Overview* > *Your Preferences* page. Refer to Section 3.3.2, “Your Preferences” (page 54) for more information.

- The *Tasks* area lists the most common tasks that an administrator performs via the web. Click on any of the links to be taken to the page within SUSE Manager that allows you to accomplish that task.

- To the right is the *Inactive System* listing. If any systems have not been checking in to SUSE Manager, they are listed here. Highlighting them in this way allows an administrator to quickly select those systems for troubleshooting.

- [Mon] — Customers with monitoring enabled on their SUSE Manager can also choose to include a list of all probes in the Warning state.

- [Mon] — Customers with monitoring enabled on their SUSE Manager can also choose to include a list of all probes in the Critical state.

- The *Critical Systems* section lists the most critical systems within your organization. It provides a link to quickly view those systems, and displays a summary of the patch updates that have yet to be applied to those systems. Click on the name of the system to be taken to the *System Details* page of that system and apply the patch updates. Below the list is a link to the *Out of Date* systems page.

- Next is the *Recently Scheduled Actions* section. Action that are less than thirty days old are considered recent. This section allows you to see all actions and their status: whether they have failed, completed, or are still pending. Click on the label of any given actions to view the details page for that action. Below the list is a link to the *Pending Actions* page, which lists all actions that have not yet been picked up by your client systems.

- The *Relevant Security Patches* section lists the security patches that are available and have yet to be applied to some or all of your client systems. It is critical that you apply these security patches to keep your systems secure. Below this section are links to all patches and to those patches that apply to your systems.

- The *System Groups* section lists the groups (if any) and indicates whether the systems in those groups are fully updated. Click on the link below this section to be taken to the *System Groups* page, from which you can chose *System Groups* to use with the System Set Manager.

- The *Recently Registered Systems* lists the systems that have been added to the SUSE Manager in the past 30 days. Click the system's name to go the *System Details* page for that particular system.

You can return to this page by clicking *Overview* on the left navigation bar.

3.3.1 Your Account

The *Your Account* page allows you to modify your personal information, such as name, password, and title. To modify any of this information, make the changes in the appropriate text fields and click the Update button in the bottom right-hand corner.

Remember, if you change your SUSE Manager password (the one used to log into SUSE Manager), you will not see your new one as you type it for security reasons. Replace the asterisks in the *Password* and *Confirm Password* text fields with your new password.

Addresses

The *Addresses* page allows you to manage your mailing, billing and shipping addresses, as well as the associated phone numbers. Just click *Edit this address* below the address to be modified, make the changes, and click Update.

Change Email

The email address listed in the *Your Account* page is the address to which SUSE Manager sends email notifications if you select to receive patch alerts or daily summaries for your systems on the *Your Preferences* page.

To change your preferred email address, click Change Email in the left navigation bar. You are then asked for the new email address. Enter it and click the Update button. A confirmation email is sent to the new email address; responding to the confirmation email validates the new email address. Note that false email addresses such as those ending in `@localhost` are filtered and rejected.

Account Deactivation

The *Account Deactivation* page provides a means to cancel your SUSE Manager service. Click the Deactivate Account button to deactivate your account. The Web interface returns you to the login screen. If you attempt to log back in, an error message advises you to contact the SUSE Manager administrator for your organization. Note that if you are the only SUSE Manager Administrator for your organization, you are unable to deactivate your account.

3.3.2 Your Preferences

The *Your Preferences* page allows you to configure SUSE Manager options, including:

- *Email Notifications* — Determine whether you want to receive email every time an patch alert is applicable to one or more systems in your account.

  IMPORTANT

  This setting also enables Management and Provisioning customers to receive a daily summary of system events. These include actions affecting packages, such as scheduled patches, system reboots, or failures to check in. In addition to selecting this checkbox, you must identify each system to be included in this summary email. (By default, all Management and Provisioning systems are included in the summary.) This can be done either individually through the *System Details* page or for multiple systems at once through the *System Set Manager* interface. Note that SUSE Manager sends these summaries only to verified email addresses. To disable all messages, simply deselect this checkbox.

- *SUSE Manager List Page Size* — Maximum number of items that appear in a list on a single page. If more items are in the list, clicking the *Next* button displays the next group of items. This preference applies to system lists, patch lists, package lists, and so on.

- *"Overview" Start Page* — Select the information areas that are displayed on the *Overview* Start Page. Check the box to the left of the information area you would like to include.

After making changes to any of these options, click the Save Preferences button in the bottom right-hand corner.

3.3.3 Locale Preferences

The *Overview* > *Locale Preferences* page allows each user to tailor their SUSE Manager interface to the local time and their preferred language. Select the appropriate timezone from the *Time Zone* dropdown box, then click the Save Preferences button to apply the selection.

When the language preference is set to *Use Browser Settings*, SUSE Manager uses the language preference from the user's browser (such as Firefox) to determine which language to use for the web interface. When one of the listed languages is selected, the user sees the web interface in that language each time they log in, regardless of their browser's settings. Choosing a preferred language may be helpful for users traveling abroad. To select a default language, click the radio button to the left of the appropriate language and click the Save Preferences button to apply the change.

3.3.4 Subscription Management

To use all of the features of SUSE Manager, your systems must be *entitled* — subscribed to Novell Customer Center. Use the *System Entitlements* page to configure which systems are entitled to which service offerings.

3.3.5 Organization Trusts

The *Organization Trusts* page displays the trusts established with your organization (that is, the organization with which you, the logged-in user, are associated). The page also lists *Channels Shared*: that is channels available to your organisation via others in the established trusts.

You can filter the list of trusts by keyword using the *Filter by Organization* text box and clicking Go.

For more information about organizational trusts, refer to Section 5.6, "Organizational Trusts" (page 195).

3.4 Systems

If you click the *Systems* tab on the top navigation bar, the *Systems* category and links appear. The pages in the *Systems* category allow you to select systems so that you can perform actions on them and create System Profiles.

3.4.1 Overview — [Mgmt]

The *Overview* page provides a summary of your systems, including their status, number of associated patches (errata) and packages, and entitlement level. Clicking on the name of a system takes you to its *System Details* page. Refer to the section called "System Details" (page 61) for more information.

Clicking the *View System Groups* link at the top of the *Overview* page takes you to a similar summary of your system groups. It identifies group status and displays the number of systems contained. Clicking on the number of systems takes you to the *Systems* tab of the *System Group Details* page, while clicking on the system name takes you to the *Details* tab for that system. Refer to the section called "System Group Details — [Mgmt]" (page 82) for more information.

You can also click the Use Group button in the *System Groups* section of the *Overview* page to go directly to the *System Set Manager*. Refer to Section 3.4.4, "*System Set Manager* — [Mgmt]" (page 83) for more information.

3.4.2 Systems

The *Systems* page displays a list of all of your registered systems. The *Systems* list contains several columns of information for each system:

- *Select* — Update or unentitled systems cannot be selected. To select systems, mark the appropriate checkboxes. Selected systems are added to the *System Set Manager*. After adding systems to the *System Set Manager*, you can use it to perform actions on them simultaneously. Refer to Section 3.4.4, "*System Set Manager* — [Mgmt]" (page 83) for details.

- *Status* — Shows which type of patch alerts are applicable to the system or confirms that it is up-to-date. Some icons are linked to pages providing resolution. For instance, the standard Updates icon is linked to the *Upgrade* subtab of the packages list, while the Critical Updates icon links directly to the *Update Confirmation* page. Also, the Not Checking In icon is linked to instructions for resolving the issue.

  - 🟩 — System is up-to-date
  - ⚠ — Critical patch (errata) available, update *strongly* recommended
  - ✴ — Updates available and recommended
  - 🔒 — System is locked; Actions prohibited
  - 💿 — System is being deployed using AutoYaST or Kickstart
  - 🟪 — Updates have been scheduled
  - 🖥 — System not checking in properly (for 24 hours or more)
  - ⬜ — System not entitled to any update service

- *Patches* — Total number of patch alerts applicable to the system.

- *Packages* — Total number of package updates for the system. Includes packages from patch alerts as well as newer packages that are not from patch alerts. For example, imagine a client system that has an early version of a package installed. If this client is then subscribed to the appropriate base channel of SUSE Manager (such as

SUSE Linux Enterprise11 SP1), that channel may have an updated version of the package. If so, the package appears in the list of available package updates.

IMPORTANT

If SUSE Manager identifies package updates for the system, yet the package updater such as Red Hat Update Agent or YaST responds with a message such as "Your system is fully updated" when run, a conflict likely exists in the system's package profile or in the `up2date` configuration file. To resolve the conflict, either schedule a package list update or remove the packages from the Package Exceptions list for the Red Hat Update Agent. Refer to the section called “System Details” (page 61) or the section called “Package Exceptions Settings” (page 34), respectively, for instructions.

- *System* — The name of the system as configured when registering it. The default name is the hostname of the system. Clicking on the name of a system takes you to the *System Details* page for the system. Refer to the section called “System Details” (page 61) for more information.

- *Base Channel* — The primary channel for the system, based upon its operating system distribution. Refer to Section 3.6.1, “Software Channels” (page 126) for more information.

- *Entitlement* — Whether or not the system is entitled and at what service level.

Links in the left navigation bar below Systems enable you to select and view predefined sets of your systems. All of the options described above can be applied within these pages.

All

The *All* page contains the default set of your systems. It displays every system you have permission to manage. A user has permission to manage a system if he is the only user in his organization, if he is an SUSE Manager Administrator, or if the system is a member of a group to which he has admin rights.

Virtual Systems

To reach this page, select the *Systems* tab, followed by the *Systems* subtab from the left navigation bar, and finally select *Virtual Systems* from the left navigation bar. This page lists each virtual host of which SUSE Manager is aware and the guest systems on those hosts.

System
: This column displays the name of each guest system.

Updates
: This column indicates whether the guest systems have any patches (errata updates) that have not yet been applied to them.

Status
: This column indicates whether a guest is running, paused, or stopped.

Base Channel
: This column indicates the base channel to which the guest is currently subscribed.

Only those guests that are registered with SUSE Manager are displayed in blue text. Clicking on the hostname of such a guest system displays that system's *System Details* page.

Out of Date

The *Out of Date* page displays the systems that have applicable patch alerts that have not been applied.

Unentitled — [Mgmt]

The *Unentitled* page displays the systems that have not yet been entitled for SUSE Manager service.

Ungrouped

The *Ungrouped* page displays the systems that have not yet been assigned to a specific system group.

Inactive

The *Inactive* page displays the systems that have not checked into SUSE Manager for 24 hours or more. When the Red Hat Update Agent on Red Hat Enterprise Linux or the YaST Online Update on SUSE Linux Enterprise client systems connect to SUSE Manager to see if there are any updates available or if any actions have been scheduled, this is considered a check-in. If you are seeing a message indicating check-ins are not taking place, the client system is not successfully reaching SUSE Manager for some reason. This indicates:

- The system is not entitled to any SUSE Manager service. System Profiles that remain unentitled for 180 days (6 months) are removed.
- The system is entitled, but the SUSE Manager Daemon (`rhnsd`) has been disabled on the system. Refer to Chapter 2, *SUSE Manager Daemon* (page 41) for instructions on restarting and troubleshooting.
- The system is behind a firewall that does not allow connections over `https` (port 443).
- The system is behind an HTTP proxy server that has not been properly configured.
- The system itself has not been properly configured, perhaps pointing at the wrong SUSE Manager Server.
- The system is not on the network.
- Some other barrier exists between the system and the SUSE Manager Server.

Recently Registered

The *Recently Registered* page displays any new systems that have been registered in a given period of time. Use the drop-down menu to specify new systems registered in days, weeks, 30- and 180-day increments, and yearly.

Duplicate Systems

The *Duplicate Systems* page lists current systems and any active and inactive entitlements associated with them. Active entitlements are in gray, while inactive entitlements are highlighted in yellow and their checkboxes checked by default for you to delete them as needed by clicking the Delete Selected button. (Entitlements are inactive, if the system has not checked into SUSE Manager in a time specified by the *A system profile is inactive if its system has not checked in for:* drop-down.)

You can filter duplicate entitlements by *IP Address*, *Hostname*, or *MAC address* by clicking on the respective subheader. You may filter further by typing in the system's hostname, IP address, or MAC address in the corresponding *Filter by:* text box.

To compare up to three duplicate entitlements at one time, click the *Compare Systems* link in the *Last Checked In* column. Inactive components of the systems are highlighted in yellow. You can then determine which systems are inactive or duplicate and delete them by clicking the Delete System Profile button. Click the Confirm Deletion button that appears to confirm your choice.

System Details

Click the name of a system on any page and SUSE Manager displays the *System Details* page for that client. From here, you may modify the displayed information or remove the system altogether by clicking the *delete system* link on the top-right corner.

NOTE

The *delete system* link in the upper right of this screen refers to the system profile only. Deleting a host system profile will not destroy or remove the registration of guest systems. Deleting a guest system profile does not remove it from the list of guests for its host, nor does it stop or pause the guest. It does, however, remove your ability to manage it via SUSE Manager.

If you mistakenly delete a system profile from SUSE Manager, you may re-register the system using the bootstrap script (see Chapter 5, *Using Bootstrap* (↑Client Configuration Guide)) or `rhnreg_ks` manuallly.

The *System Details* page is further divided into the following tabs:

- Details
- Software
- Configuration

- Provisioning — [Prov]

- Monitoring — [Mon]

- Groups

- Events

The following sections discuss these tabs and their subtabs in detail.

System Details > Details

This page is not accessible from any of the standard navigation bars. However, clicking on the name of a system anywhere in the web interface brings you to this page. The default tab displayed on this page is the *Details* > *Overview* subtab. Other tabs are available, depending on the current entitlement level of the system.

System Details > Details > Overview

This system summary page displays the system status message and the following key information about the system:

System Status

This message indicates the current state of your system in relation to SUSE Manager.

> **NOTE**
>
> If updates are available for any entitled system, the message *Critical updates available* appears. To apply these updates, click the *update now* link.

System Info

Hostname
The hostname as defined by the client system.

IP Address
The IP address of the client.

Kernel
The kernel that is installed and operating on the client system.

SUSE Manager System ID
A unique identifier generated each time a system registers with SUSE Manager.

NOTE

The system ID can be used to eliminate duplicate profiles from SUSE Manager. Compare the system ID listed on this page with the information stored on the client system in the `/etc/sysconfig/rhn/systemid` file. In that file, the system's current ID is listed under `system_id`. The value starts after the characters `ID-`. If the value stored in the file does not match the value listed in the profile, the profile is not the most recent one and may be removed.

Lock Status
Indicates whether a system has been locked.

Actions cannot be scheduled for locked systems through the Web interface until the lock is removed manually. This does not include preventing automated patch updates scheduled through the Web interface. To prevent the application of automated patch updates, de-select *Auto Patch Update* from the *System Details* > *Details* > *Properties* subtab. For more information, refer to the section called "*System Details > Details > Properties*" (page 66).

Locking a system can help to prevent you from accidentally making any changes to a system until you are ready to do so. For example, the system may be a production system that you do not wish to receive updates or new packages until you decide to unlock it.

IMPORTANT

Locking a system in the Web interface *will not* prevent any actions that originate from the client system. For example, if a user logs into the client directly and runs YaST Online Update (on SLE) or `up2date` (resp. `pup` on RHEL), the update tool will install available patches whether or not the system is locked in the Web interface.

Further, locking a system *does not* restrict the number of users who can access the system via the Web interface. If you wish to restrict access to the system, associate that system with a System Group and assign it a System Group Administrator. Refer to Section 3.4.3, “System Groups — [Mgmt]” (page 80) for more information about System Groups.

It is also possible to lock multiple systems via the System Set Manager. Refer to the section called “System Set Manager > *Misc* > *Lock Systems* — [Mgmt]” (page 90) to learn how to do so.

Subscribed Channels

List of subscribed channels. Click the *(Alter Channel Subscriptions)* link right beside the title to select from the available base and child channels for this system. When finished making selections, click the Change Subscriptions button to confirm the changes. For more information, refer to the section called “*System Details* > *Software* > *Software Channels*” (page 72).

Base Channel
The first line indicates the base channel to which this client is subscribed. The base channel should match the operating system of the system.

Child Channels
The subsequent lines of text, which depend from the base channel, are child channels. An example is the *SUSE Manager Tools* channel.

System Events

Checked In
The date and time at which the system last checked in with SUSE Manager.

Registered
The date and time at which the system registered with SUSE Manager and created this profile.

Last Booted
The date and time at which the system was last started or restarted.

NOTE

Systems with a Management entitlement can be rebooted from this screen.

1. Select *Schedule system reboot*.
2. Provide the earliest date and time at which the reboot may take place.
3. Click the Schedule Reboot button in the lower right.

When the client checks in after the scheduled start time, SUSE Manager will instruct the system to restart itself.

[Prov] — OSA status is also displayed for client systems registered with SUSE Manager that have a Provisioning entitlement and have enabled OSA. For more information about OSA, refer to Section “Enabling Push to Clients” (↑Installation Guide).

Push enables SUSE Manager customers to immediately initiate tasks on Provisioning-entitled systems rather than wait for those systems to check in with SUSE Manager. Scheduling actions through push is identical to the process of scheduling any other action, except that the task begins immediately instead of waiting the set interval.

In addition to the configuration of SUSE Manager, each client system to receive pushed actions must have the `osad` package installed and its service started. Refer to the Section “Enabling Push to Clients” (↑Installation Guide) for details.

System Properties

Entitlement
The base entitlement currently applied to this system.

Notifications
Indicates the notification options for this system. You can choose whether you wish to receive email notifying you of available patch updates for this system. In addition, you may choose to include Management-entitled systems in the daily summary e-mail.

Auto Patch Update
Indicates whether this system is configured to accept updates automatically.

Description

This information is automatically generated at registration. You can edit this to include any information you wish.

Location

If entered, this field displays the physical address of the system.

Clicking the *Edit These Properties* link right beside the *System Properties* title opens the *System Details* > *Properties* subtab. On this page, edit any text you choose, then click the Update Properties button to confirm.

System Details > Details > Properties

This subtab allows you to alter the following basic properties of your system:

System Details Properties

System Name

By default, this is the hostname of the system. You can however alter the profile name to anything that allows you to distinguish this profile from others.

Base Entitlement

Select a base channel for the system from the available base entitlements.

Add-on entitlements

If available, apply a Monitoring, Provisioning, Virtualization, or Virtualization Platform entitlement to the system.

Notifications

Toggle whether notifications about this system are sent and whether this system is included in the daily summary. (By default, all Management and Provisioning systems are included in the summary.) This setting keeps you abreast of all advisories pertaining to the system. Anytime an update is produced and released for the system, a notification is sent via e-mail.

The daily summary reports system events that affect packages, such as scheduled patch updates, system reboots, or failures to check in. In addition to including the system here, you must choose to receive e-mail notification in the *Your Preferences* page of the *Overview* category.

Auto Patch Update

If this box is checked, available patches are automatically applied to the system when it checks in. This action takes place without user intervention. The SUSE Manager Daemon (`rhnsd`) must be enabled on the system for this feature to work.

> **NOTE: Conflicts With Third Party Packages**
>
> Enabling auto-update might lead to failures because of conflicts between system updates and third party packages. To avoid failures caused by those issues, it is better to let this box unchecked.

Description

By default, this text box records the operating system, release, and architecture of the system when it first registers. You may edit this information to include anything you like.

The remaining fields record the physical address at which the system is stored. To confirm any changes to these fields, click the Update Properties button.

> **NOTE: Setting Properties to Multiple Systems**
>
> Many of these properties can be set for multiple systems at once through the System Set Manager interface. Refer to Section 3.4.4, "*System Set Manager* — [Mgmt]" (page 83) for details.

System Details > Details > Remote Command — [Prov]

This subtab allows you to run a remote command on the system if the system possesses a Provisioning entitlement. Before doing so, you must first configure the system to accept such commands.

1 On SLE clients, subscribe the system to the SUSE Manager Tools child channel and use `zypper` to install the `rhncfg`, `rhncfg-client`, and `rhncfg-actions` packages, if not already installed:

```
zypper in rhncfg rhncfg-client rhncfg-actions
```

On RHEL clients, subscribe the system to the Tools child channel and use `up2date` or `yum` to install the `rhncfg`, `rhncfg-client`, and `rhncfg-actions` packages, if not already installed.

```
up2date rhncfg rhncfg-client rhncfg-actions
```

2 Log into the system as root and add the following file to the local SUSE Manager configuration directory: `allowed-actions/scripts/run`.

   2a Create the necessary directory on the target system:

   ```
   mkdir -p /etc/sysconfig/rhn/allowed-actions/script
   ```

   2b Create an empty `run` file in that directory to act as a flag to SUSE Manager signaling permission to allow remote commands:

   ```
   touch /etc/sysconfig/rhn/allowed-actions/script/run
   ```

Once the setup is complete, refresh the page in order to view the text fields for remote commands. You may then identify a specific user, group, and timeout period, as well as the script itself on this page. Select a date and time to begin attempting the command, and click Schedule Remote Command.

System Details > Details > Reactivation — [Prov]

An activation key specific to this System Profile. Reactivation keys, available only for systems that have a Provisioning entitlement, include this system's ID, history, groups, and channels. This key can then be used only once with the `rhnreg_ks` command line utility to re-register this system and regain all SUSE Manager settings. Refer to Section 1.3.5, “Registering with Activation Keys” (page 37) for instructions. Unlike typical activation keys, which are not associated with a specific system ID, keys created here do not show up within the *Activation Keys* page.

Reactivation keys can be combined with activation keys to aggregate the settings of multiple keys for a single system profile. For example:

```
rhnreg_ks --server=server-url \
  --activationkey=reactivation-key,activationkey --force
```

WARNING

When autoinstalling a system with its existing SUSE Manager profile, the profile uses the system-specific activation key created here to re-register the system and return its other SUSE Manager settings. For this reason, you should not regenerate, delete, or use this key (with `rhnreg_ks`) while a profile-based autoinstallation is in progress. If you do, the autoinstallation will fail.

System Details > Details > Hardware

This subtab provides detailed information about the system, including networking, BIOS, memory, and other devices. This appears only if you selected to include the hardware profile for this machine during registration. If the hardware profile looks incomplete or outdated, click the Schedule Hardware Refresh button to schedule a Hardware Profile update for your system. The next time the SUSE Manager Daemon (`rhnsd`) connects to SUSE Manager, it will update your System Profile with the latest list of hardware.

System Details > Details > Migrate

This subtab provides a place to migrate systems between organizations. Select an *Organization Name* and click *Migrate System* to initiate the migration.

System Details > Details > Notes

This subtab provides a place to create notes about the system. To add a new note, click the *create new note* link, type a subject and details, and click the Create button. To modify a note, click on its subject in the list of notes, make your changes, and click the Update button. To remove a note, click on its subject in the list of notes and then click the delete note link.

System Details > Details > Custom Info — [Prov]

This subtab, available for systems with a Provisioning entitlement, provides completely customizable information about the system. Unlike *Notes*, *Custom Info* is structured, formalized, and can be searched upon. Before you can provide custom information about a system, you must first have *Custom Information Keys*. This is done via the *Custom System Info* page, available from the left navigation bar. Refer to Section 3.4.8, “Custom System Info — [Prov]” (page 99) for instructions.

Once you have created one or more Keys, you may assign a value for this system by select the *create new value* link. Click the name of the key in the resulting list and enter a value for it in the *Description* field, then click the Update Key button.

System Details > Software

This tab and its accompanying subtabs allow you to manage the software of the system: patches (errata), packages and package profiles, and software channel memberships.

System Details > Software > Patches

This subtab contains a list of patch (errata) alerts applicable to the system. Refer to Section 3.1.3, "Patch Alert Icons" (page 48) for meanings of the icons on this tab. To apply updates, select them and click the Apply Patches button. Double-check the updates to be applied on the confirmation page, then click the Confirm button. After confirming, the action is added to the *Pending Actions* list under *Schedule*. Patches that have been scheduled cannot be selected for update. In the place of a checkbox is a clock icon that, when clicked, takes you to the *Action Details* page.

To help users determine whether an update has been scheduled, a *Status* column exists within the patches table. Possible values are: None, Pending, Picked Up, Completed, and Failed. This column identifies only the latest action related to a patch. For instance, if an action fails and you reschedule it, this column shows the status of the patch as `>Pending` only (with no mention of the previous failure). Clicking a status other than`None` takes you to the *Action Details* page. This column corresponds to the one on the *Affected Systems* tab of the *Patch Details* page.

System Details > Software > Packages

This subtab allows you to manage the packages on the system.

[Prov] — When selecting packages to install, upgrade, or remove, Provisioning customers have the option of running a remote command automatically before or after the package installation. Refer to the section called "*System Details* > *Details* > *Remote Command* — [Prov]" (page 67) for more information.

Packages
: The default display of the *Packages* tab describes the options available to you and provides the means to update your package list. To update or complete a potentially outdated list, possibly due to the manual installation of packages, click the *Update Package List* button on the bottom right-hand corner of this page. The next time the SUSE Manager Daemon (`rhnsd`) connects to SUSE Manager, it updates your System Profile with the latest list of installed packages.

List/Remove

Lists installed packages and enables you to remove them. View and sort packages by name, architecture, and the date it was installed on the system. Search for the desired packages by typing it in the *Filter by Package Name* text box, or by clicking the letter or number corresponding the first character of the package name. Click on a package name to view its *Package Details* page. To delete packages from the system, select their checkboxes and click the Remove Packages button on the bottom right-hand corner of the page. A confirmation page appears with the packages listed. Click the Confirm button to remove the packages.

Upgrade

Displays a list of packages that have a new version available based on the package versions in the channels for the system. Click on the latest package name to view its *Package Details* page. To upgrade packages immediately, select them and click the Upgrade Packages button. To download the packages as a .tar file, select them and click the Download Packages button.

Install

Enables you to install new packages on the system from the available channels. Click on the package name to view its *Package Details* page. To install packages, select them and click the Install Selected Packages button.

Verify

Validates the packages installed on the system against its RPM database. This is the equivalent of running `rpm -V`. Specifically, this tab allows you to compare the metadata of the system's packages with information from the database, such as file checksum, file size, permissions, owner, group and type. To verify a package or packages, select them, click the Verify Selected Packages button, and confirm this action. Once finished, you can view the results by selecting this action within the *History* subtab under *Events*.

Profiles

Gives you the ability to compare the packages on this system with the packages of stored profiles and other Management and Provisioning systems. To make the comparison with a stored profile, select that profile from the pulldown menu and click the *Compare* button. To make the comparison with another system, select it from the associated pulldown menu and click the *Compare* button. To create a stored profile based upon the existing system, click the Create System Profile button, enter any additional information you desire, and click the Create Profile button.

These profiles are kept within the *Stored Profiles* page linked from the left navigation bar.

[Prov] — Once package profiles have been compared, Provisioning customers have the ability to synchronize the packages of the selected system with the package manifest of the compared profile. Note that this action may delete packages on the system not in the profile, as well as install packages from the profile. To install specific packages, select the checkboxes of packages from the profile. To remove specific packages already installed on the system itself, select the checkboxes of packages showing a difference of *This system only.* To synchronize fully the system's packages with the compared profile, select the master checkbox at the top of the column. Then click the Sync Packages to button. On the confirmation screen, review the changes, select a time frame for the action, and click the Schedule Sync button.

System Details > Software > Software Channels

Software channels provide a well-defined method to determine which packages should be available to a system for installation or upgrade based upon its operating systems, packages, and functionality. Click a channel name to view its *Channel Details* page. To modify the child channels associated with this system, use the checkboxes next to the channels and click the Change Subscriptions button. You will receive a success message or be notified of any errors. To change the system's base channel, select the new one from the pulldown menu and click the Modify Base Channel button. Refer to Section 3.6.1, “Software Channels” (page 126) for more information.

System Details > Configuration — [Prov]

This tab and its subtabs, which do not appear without a Provisioning entitlement, assist in managing the configuration files associated with the system. These configuration files may be managed solely for the current system, or may be distributed widely via a Configuration Channel. The following section describe these and other available options on the *System Details* > *Configuration* subtabs.

NOTE

To manage the configuration of a system, it must have the latest `rhncfg*` packages installed. Refer to Section 3.7.1, “Preparing Systems for Config Management” (page 135) for instructions on enabling and disabling scheduled actions for a system.

This section is available to normal users with access to systems that have configuration management enabled. Like software channels, configuration channels store files to be installed on systems. While software updates are provided by NCC, configuration files are managed solely by you. Also unlike software packages, various versions of configuration files may prove useful to a system at any given time. Remember, only the latest version can be deployed.

System Details > Configuration > Overview

This subtab provides access to the configuration statistics of your system and to the most common tasks used to manage configuration files. You may change the settings listed under Configuration Stats by clicking on the blue text for that setting. Alternatively, you may perform any of the common configuration management tasks listed on the right of the screen by clicking one of the links.

System Details > Configuration > Managed Files

This subtab lists all configuration files currently associated with the system.

Filename
: This column shows both the name and the deployment path for this file.

Revision
: This column increments any time you make a change to the managed file.

From Config Channel
: This column indicates the name of the channel that contains the file, or displays *(system override)* for files available to this system only.

Overrides
: If this configuration file overrides another, the overridden file is listed in this column along with its host channel.

If you wish to deploy any of these files to the client system, overwriting any changes that have been made locally, check the box to the left of the file and click the Deploy Configuration button. On the following screen, choose a deployment time and click the Schedule Deploy button to confirm.

NOTE

If you click on the *Filename* of a *(system override)* file, you can edit its contents.

The *Overrides* column identifies the configuration file in an unsubscribed channel that would replace the same file in a currently subscribed channel. For example, if a system has `/etc/foo` from channel `bar` and `/etc/foo` from channel `baz` is in the Overrides column, then unsubscribing from channel `bar` will mean that the file from channel `baz` will be applicable. Also, if nothing is in the *Overrides* column for a given file path, then unsubscribing from the channel providing the file will mean that the file is no longer managed (though it will *not* remove the file from the system).

System Details > Configuration > Compare Files

This subtab compares a configuration file as stored on the SUSE Manager with the file as it exists on the client. (It does not, for example, compare versions of the same file stored in different channels.) Select the files to be diffed, click the Compare Files button, select a time to perform the diff, and click the Schedule Compare button to confirm. After the diff has been performed, you may return to this page to view the results.

System Details > Configuration > Manage Configuration Channels

This subtab allows you to subscribe to and rank configuration channels that may be associated with the system, lowest first.

The *List/Unsubscribe from Channels* subtab contains a list of the system's configuration channel subscriptions. Click the checkbox next to the Channel and click Unsubscribe to remove the subscription to the channel.

The *Subscribe to Channels* subtab lists all available configuration channels. To subscribe to a channel, select the checkbox next to it and press Continue. To subscribe to all configuration channels, click Select All and press Continue. The *View/Modify Rankings* page automatically loads.

The *View/Modify Rankings* subtab allows users rank the priority in which files from a particular configuration channel are weighted. The higher the channel is on the list, the more its files take precedence over files on lower-ranked channels (for example, the higher-ranked channel may have an `httpd.conf` file that will take precedence over the file on lower-ranked channel).

System Details > Configuration > Local Overrides

This subtab displays the default configuration files for the system and allows you to manage them. If no files exist, you may use the *add files*, *upload files*, and *add directo-*

ries links within the page description to associate files with this system. These tabs correspond to those within the *Configuration Channel Details* page, affecting your entire organization and available only to Configuration Administrators. Refer to the section called “*Configuration* > *Configuration Channels* > *Configuration Channel Details*” (page 138) for more information.

If a file exists, click its name to go to the *Configuration File Details* page. Refer to Section 3.7.4, “Configuration Files” (page 140) for instructions. To replicate the file within a config channel, select its checkbox, click the Copy to Config Channel button, and select the destination channel. To remove a file, select it and click Delete Selected Files.

System Details > Configuration > Sandbox

This subtab allows you to manipulate configuration files without deploying them. This sandbox provides you with an area in which to experiment with files without affecting your systems. To add files, click the *import new files* link, enter the path to the file on you local system, and click the Add button. Select the Import Files button to confirm.

System Details > Provisioning — [Prov]

This tab and its subtabs allow you to schedule and monitor AutoYaST or Kickstart intallations and to return your system to a previous state. AutoYaST is a SUSE Linux and Kickstart is a Red Hat utility—both allow you to automate the re-installation of a system. Snapshot rollbacks provide the ability to revert certain changes to the system. For example, you can roll back a set of RPM packages, but rolling back across multiple update levels is not supported. Both features are described in the sections that follow.

System Details > Provisioning > Autoinstallation — [Prov]

This subtab is further divided into *Session Status*, which tracks the progress of previously scheduled autoinstallations, and *Schedule*, which allows you to configure and schedule an autoinstallation for this system.

The *Schedule* subtab allows you to schedule the selected system for autoinstallation. Choose from the list of available profiles, select a time for the autoinstallation to begin, and click the Schedule Autoinstall and Finish button to begin the autoinstallation. You may first alter autoinstallation settings by clicking the Advanced Configuration button.

NOTE

You must first create a profile before it appears on this subtab. If you have not created any profiles, refer to the section called “Create a New Kickstart Profile” (page 108) before scheduling a autoinstallation for a system.

The *Variables* subtab can be used to create Kickstart variables, which substitute values into kickstart files. To define a variable, create a name-value pair (`name/value`) in the text box.

For example, if you wanted to kickstart a system that joins the network for specified department (for example the Engineering organization) you can create a profile variable to set the IP address and the gateway server address to a variable that any system using that profile will use. Add the following line to the *Variables* text box.

```
IPADDR=192.168.0.28
GATEWAY=192.168.0.1
```

To use the system variable, you can use the name of the variable within the profile to substitute in the value. For example, the `network` portion of a kickstart file could look like the following:

```
network --bootproto=static --device=eth0 --onboot=on --ip=$IPADDR
--gateway=$GATEWAY
```

The `$IPADDR` will be **`192.168.0.28`**, and the `$GATEWAY` will be **`192.168.0.1`**

NOTE

There is a hierarchy when creating and using variables in kickstart files. System kickstart variables take precedence over Profile variables, which in turn take precendence over Distribution variables. Understanding this hierarchy can alleviate confusion when using variables in kickstarts.

Using variables are just one part of the larger Cobbler infrastructure for creating templates that can be shared between multiple profiles and systems. For more information about Cobbler and kickstart templates, refer to Chapter 6, *Cobbler* (page 203).

System Details > Provisioning > Snapshots — [Prov]

Snapshots enable you to roll back the system's package profile, configuration files, and SUSE Manager settings. Snapshots are captured whenever an action takes place on a

Provisioning-entitled system. The *Snapshots* subtab lists all snapshots for the system, including the reason the snapshot was taken, the time it was taken, and the number of tags applied to each snapshot. To revert to a previous configuration, click the *Reason* of the snapshot taken and review the potential changes on the provided subtabs, starting with *Rollback*.

NOTE

Snapshot roll backs support the ability to revert *certain* changes to the system, but not in every scenario. For example, you can roll back a set of RPM packages, but rolling back across multiple update levels is not supported.

Each subtab provides the specific changes that will be made to the system during the rollback:

- group memberships
- channel subscriptions
- installed packages
- configuration channel subscriptions
- configuration files
- snapshot tags

When satisfied with the reversion, return to the *Rollback* subtab and click the Rollback to Snapshot button. To see the list again, click *Return to snapshot list*.

System Details > Provisioning > Snapshot Tags — [Prov]

Provides a means to add meaningful descriptions to your most recent system snapshot. This can be used to indicate milestones, such as a known working configuration or a successful upgrade. To tag the most recent snapshot, click *create new system tag*, enter a descriptive term in the *Tag name* field, and click the Tag Current Snapshot button. You may then revert using this tag directly by clicking its name in the Snapshot Tags list. To delete tags, select their checkboxes, click Remove Tags, and confirm the action.

System Details > Monitoring — [Mon]

This tab is only visible for systems registered with SUSE Manager with Monitoring enabled and that are Monitoring entitled. It displays all of the probes monitoring the system. The *State* column shows icons representing the status of each probe. Refer to Section 3.10, "Monitoring — [Mon]" (page 153) for descriptions of these states. Clicking the *Probe Description* takes you to its *Current State* page. The *Status String* column displays the last message received from the probe.

To add a probe to the system, click the *create new probe* link at the top-right corner of the page and complete the fields on the following page. Refer to Section 4.5.1, "Managing Probes" (page 177) for detailed instructions.

Once the probe has been added, you must reconfigure your Monitoring infrastructure to recognize it. Refer to Section 3.10.2, "Scout Config Push — [Mon]" (page 156) for details. After the probe has run, its results become available on the *Current State* page. Refer to the section called "*Current State* — [Mon]" (page 155) for details.

To remove a probe from a system, click on the name of the probe, then click the *delete probe* link in the upper right corner. Finally, click the Delete Probe button to complete the process.

System Details > Groups — [Mgmt]

This tab and its subtabs allow you to manage the system's group memberships.

System Details > Groups > List/Leave — [Mgmt]

This subtab lists groups to which the system belongs and enables you to cancel those associations. Only System Group Administrators and SUSE Manager Administrators can remove the system from groups. Non-admins just see a *Review this system's group membership* page. To remove the system from groups, select the groups' checkboxes and click the Leave Selected Groups button. Click on a group's name to go to its *System Group Details* page. Refer to the section called "System Group Details — [Mgmt]" (page 82) for more information.

System Details > Groups > Join — [Mgmt]

Lists groups that the system may be subscribed to. Only System Group Administrators and SUSE Manager Administrators can add the system to groups. Non-admins see a

Review this system's group membership page. To add the system to groups, select the groups' checkboxes and click the Join Selected Groups button.

System Details > Events

Displays past, current, and scheduled actions on the system. You may cancel pending events here. The following sections describe the *Events* subtabs and the features they offer.

System Details > Events > Pending

Lists events that are scheduled but have not begun. A prerequisite action must complete successfully before a given action is attempted. If an action has a prerequisite, no checkbox is available to cancel that action. Instead, a checkbox appears next to the prerequisite action; canceling the prerequisite action causes the action in question to fail.

Actions can be chained in this manner so that action 'a' requires action 'b' which requires action 'c'. Action 'c' is the first one attempted and has a checkbox next to it until it is completed successfully—if any action in the chain fails, the remaining actions also fail. To unschedule a pending event, select the event and click the Cancel Events button at the bottom of the page. The following icons indicate the type of events listed here:

- — Package Event
- — Patch Event
- — Preferences Event
- — System Event

System Details > Events > History

The default display of the *Events* tab lists the type and status of events that have failed, occurred or are occurring. To view details of an event, click its summary in the *System History* list. To again view the table, click *Return to history list* at the bottom of the page.

3.4.3 System Groups — [Mgmt]

The *System Groups* page allows all SUSE Manager Management and Provisioning users to view the *System Groups* list. Only System Group Administrators and SUSE Manager Administrators may perform the following additional tasks:

1. Create system groups. (Refer to the section called “Creating Groups” (page 81).)

2. Add systems to system groups. (Refer to the section called “Adding and Removing Systems in Groups” (page 81).)

3. Remove systems from system groups. (Refer to the section called “System Details” (page 61).)

4. Assign system group permissions to users. (Refer to Section 3.9, “Users — [Mgmt]” (page 146).)

The *System Groups* list displays all of your system groups.

The *System Groups* list contains several columns for each group:

- *Select* — These checkboxes enable you to add systems in groups to the *System Set Manager*. To select groups, mark the appropriate checkboxes and click the Update button below the column. All systems in the selected groups are added to the *System Set Manager*. You can then use the *System Set Manager* to perform actions on them simultaneously. It is possible to select only those systems that are members of all of the selected groups, excluding those systems that belong only to one or some of the selected groups. To do so, select them and click the Work with Intersection button. To add all systems in all selected groups, select them and click the Work with Union button. Each system will show up once, regardless of the number of groups to which it belongs. Refer to Section 3.4.4, “*System Set Manager* — [Mgmt]” (page 83) for details.

- *Updates* — Shows which type of patch alerts are applicable to the group or confirms that it is up-to-date. Clicking on a group's status icon takes you to the *Patch* tab of its *System Group Details* page. Refer to the section called “System Group Details — [Mgmt]” (page 82) for more information.

  The status icons call for differing degrees of attention:

  - 🟩 — All systems within group are up-to-date
  - ⚠ — Critical patches available, update *strongly* recommended
  - 🟧 — Updates available and recommended

- *Group Name* — The name of the group as configured during its creation. The name should be explicit enough to easily differentiate between it and other groups. Clicking on the name of a group takes you to *Details* tab of its *System Group Details* page. Refer to the section called “System Group Details — [Mgmt]” (page 82) for more information.

- *Systems* — Total number of systems contained by the group. Clicking on the number takes you to the *Systems* tab of the *System Group Details* page for the group. Refer to the section called “System Group Details — [Mgmt]” (page 82) for more information.

- *Use in SSM* — Clicking the Use Group button in this column loads the group from that row and launches the *System Set Manager* immediately. Refer to Section 3.4.4, “*System Set Manager* — [Mgmt]” (page 83) for more information.

Creating Groups

To add a new system group, click the create new group link at the top-right corner of the page. Type a name and description and click the Create Group button. Make sure you use a name that clearly sets this group apart from others. The new group will appear in the *System Groups* list.

Adding and Removing Systems in Groups

Systems can be added and removed from system groups in two places: the *Target Systems* tab of the *System Group Details* page and the *Groups* tab of the *System Details* page. The process is similar in both instances. Select the systems to be added or removed and click the Add Systems or Remove Systems button.

System Group Details — [Mgmt]

At the top of each *System Group Details* page are two links: *work with group* and *delete group*. Clicking *delete group* deletes the System Group and should be used with caution. Clicking *Work with Group* functions similarly to the Use Group button from the *System Groups* list in that it loads the group's systems and launches the *System Set Manager* immediately. Refer to Section 3.4.4, "*System Set Manager* — [Mgmt]" (page 83) for more information.

The *System Group Details* page is broken down into tabs:

System Group Details > Details — [Mgmt]

Provides the group name and group description. To change this information, click *Edit Group Properties*, make your changes in the appropriate fields, and click the Modify Details button.

System Group Details > Systems — [Mgmt]

Lists systems that are members of the system group. Clicking links within the table takes you to corresponding tabs within the *System Details* page for the associated system. To remove systems from the group, select the appropriate checkboxes and click the Remove from group button on the bottom of the page. Clicking it does not delete systems from SUSE Manager entirely. This is done through the *System Set Manager* or *System Details* pages. Refer to Section 3.4.4, "*System Set Manager* — [Mgmt]" (page 83) or the section called "System Details" (page 61), respectively.

System Group Details > Target Systems — [Mgmt]

Target Systems — Lists all systems in your organization. This tab enables you to add systems to the specified system group. Select the systems using the checkboxes to the left and click the Add Systems button on the bottom right-hand corner of the page.

System Group Details > Patches — [Mgmt]

List of relevant patches for systems in the system group. Clicking the Advisory takes you to the *Details* tab of the *Patch Details* page. (Refer to the section called "Patch Details" (page 123) for more information.) Clicking the Affected Systems number lists all of the systems addressed by the patch. To apply the patch updates in this list, select the systems and click the Apply Patches button.

System Group Details > Admins — [Mgmt]

List of all organization users that have the ability to manage the system group. SUSE Manager Administrators are clearly identified. System Group Administrators are marked with an asterisk (*). To change the system group's users, select and unselect the appropriate checkboxes and click the Update button.

System Group Details > Probes — [Prov]

List all probes assigned to systems in the system group. The *State* shows the status of the probe. Click the individual *System* for details on the probe and to make changes to the probe configuration. Click the *Probe* to generate a customizable report on the monitoring.

3.4.4 *System Set Manager* — [Mgmt]

Many actions performed for individual systems through the System Details page may be performed for multiple systems via the System Set Manager, including:

- Apply patch updates
- Upgrade packages to the most recent versions available
- Add/remove systems to/from system groups
- Subscribe/unsubscribe systems to/from channels
- Update system profiles
- Modify system preferences such as scheduled download and installation of packages
- Autoinstall several Provisioning-entitled systems at once
- Set the subscription and rank of configuration channels for Provisioning-entitled systems
- Tag the most recent snapshots of your selected Provisioning-entitled systems

- Revert Provisioning-entitled systems to previous snapshots

- Run remote commands on Provisioning-entitled systems

Before performing actions on multiple systems, select the systems you wish to modify. To do so, click the *List the systems* link, check the boxes to the left of the systems you wish to select, and click the *Update List* button.

You can access the System Set Manager in three ways:

1. Click the *System Set Manager* link in the left gray navigation area.

2. Click the *Use Group* button in the *System Groups* list.

3. Check the *Work with Group* link on the *System Group Details* page.

System Set Manager > Overview — [Mgmt]

Description of the various options available to you in the remaining tabs.

System Set Manager > Systems — [Mgmt]

List of systems now selected. To remove systems from this set, select them and click the Remove button.

System Set Manager > Patches — [Mgmt]

List of patch updates applicable to the current system set. Click the number in the Systems column to see to which systems in the System Set Manager the given patch applies. To apply updates, select the patches and click the Apply Patches button.

System Set Manager > Packages — [Mgmt]

Options to modify packages on the system within the following subtabs. (Click the number in the Systems column to see to which systems in the System Set Manager the given package applies):

[Prov] — When selecting packages to install, upgrade, or remove, Provisioning customers have the option of running a remote command automatically before or after the package installation. Refer to the section called “*System Details* > *Details* > *Remote Command* — [Prov]” (page 67) for more information.

System Set Manager > Packages > Upgrade — [Mgmt]

A list of all the packages installed on the selected systems that might be upgraded. Systems must be subscribed to a channel providing the package for the system to be able to upgrade the package. If multiple versions of a package appear, note that only the latest version available to each system is upgraded on that system. Select the packages to be upgraded, then click the Upgrade Packages button.

System Set Manager > Packages > Install — [Mgmt]

A list of channels from which you may retrieve packages. This list includes all channels to which systems in the set are subscribed; a package is installed on a system only if the system is subscribed to the channel from which the package originates. Click on the channel name and select the packages from the list. Then click the Install Packages button.

System Set Manager > Packages > Remove — [Mgmt]

A list of all the packages installed on the selected systems that might be removed. Multiple versions appear if systems in the System Set Manager have more than one version installed. Select the packages to be deleted, then click the Remove Packages button.

System Set Manager > Verify — [Mgmt]

A list of all installed package whose contents, file checksum, and other details may be verified. At the next check in, the verify event issues the command `rpm --verify` for the specified package. If there are any discrepancies, they are displayed in the System Details page for each system.

Select the checkbox next to all packages to be verified, then click the *Verify Packages* button. On the next page, select either *Schedule actions ASAP* or choose a date and time for the verification, then click the *Schedule Verifications* button.

System Set Manager > Groups — [Mgmt]

Tools to create groups and manage group membership. These functions are limited to SUSE Manager Administrators and System Group Administrators. To add a new group, click *create new group* on the top-right corner. In the resulting page, type its name and description in the identified fields and click the Create Group button. To add or remove the selected systems in any of the system groups, toggle the appropriate radio buttons and click the Alter Membership button.

System Set Manager > Channels — [Mgmt]

Options to manage channel associations through the following subtabs:

System Set Manager > Channels > Channel Subscriptions — [Mgmt]

To subscribe or unsubscribe the selected systems in any of the channels, toggle the appropriate checkboxes and click the Alter Subscriptions button. Keep in mind that subscribing to a channel uses a channel entitlement for each system in the selected group. If too few entitlements are available, some systems fail to subscribe. Systems must subscribe to a base channel before subscribing to a child channel.

System Set Manager > Configuration — [Prov]

Like the options within the *System Details* > *Channels* > *Configuration* tab, the subtabs here can be used to subscribe the selected systems to configuration channels and deploy and compare the configuration files on the systems. The channels are created in the *Manage Config Channels* interface within the *Channels* category. Refer to Section 3.7.2, “Overview” (page 136) for channel creation instructions.

To manage the configuration of a system, install the latest `rhncfg*` packages. Refer to Section 3.7.1, “Preparing Systems for Config Management” (page 135) for instructions on enabling and disabling scheduled actions for a system.

System Set Manager > Configuration > Deploy Files — [Prov]

Use this subtab to distribute configuration files from your central repository on SUSE Manager to each of the selected systems. The table lists the configuration files associated with any of the selected systems. Clicking its system count displays the systems already subscribed to the file.

To subscribe the selected systems to the available configuration files, select the checkbox for each desired file. When done, click Deploy Configuration and schedule the action. Note that the files deployed are of the latest version at the time of scheduling and do not account for versions that may appear before the action takes place.

System Set Manager > Configuration > Compare Files — [Prov]

Use this subtab to validate configuration files on the selected systems against copies in your central repository on SUSE Manager. The table lists the configuration files associated with any of the selected systems. Clicking its system count displays the systems already subscribed to the file.

To compare the configuration files deployed on the systems with those in SUSE Manager, select the checkbox for each file to be validated. Then click Analyze Differences and schedule the action. Note that the files compared are of the latest version at the time of scheduling and do not account for versions that may appear before the action takes place. Find the results within the main *Schedule* category or within the *System Details* > *Events* tab.

System Set Manager > Configuration > Subscribe to Channels — [Prov]

Subscribe systems to configuration channels according to order of preference. This tab is available only to SUSE Manager Administrators and Configuration Administrators. Enter a number in the *Rank* column to subscribe to a channel. Channels are accessed in the order of their rank, starting from the number 1. Channels not assigned a numeric value are not associated with the selected systems. Your local configuration channel always overrides all other channels. Once you have established the rank of the config channels, you must decide how they are applied to the selected systems.

The three buttons below the channels reflect your options. Clicking Subscribe with Highest Priority places all the ranked channels before any other channels to which the selected systems are currently subscribed. Clicking Subscribe With Lowest Priority places the ranked channels after those channels to which the selected systems are currently subscribed. Clicking Replace Existing Subscriptions removes any existing association and starts cleanly with the ranked channels, leaving every system with the same config channels in the same order.

In the first two cases, if any of the newly ranked config channels is already in a system's existing config channel list, the duplicate channel is removed and replaced according to the new rank, effectively reordering the system's existing channels. When such conflicts exist, you are presented with a confirmation page to ensure the intended action is correct. When the change has taken place, a message appears at the top of the page indicating the update was successful.

System Set Manager > Configuration > Unsubscribe from Channels — [Mgmt]

Administrators may unsubscribe from configuration channels by clicking the checkbox by the name of the channel and clicking Unsubscribe Systems button.

System Set Manager > Configuration > Enable Configuration — [Mgmt]

Administrators may enable configuration channel management by clicking the checkbox by the name of the channel and clicking Enable Configuration Management button. You can also schedule the action by clicking the *Schedule package installs for no sooner than* radio button and using the drop-down menus to configure date and time, then clicking Enable Configuration Management.

System Set Manager > Provisioning — [Prov]

Options for provisioning systems through the following subtabs:

System Set Manager > Provisioning > Autoinstallation — [Prov]

Use this subtab to re-install a client on the selected Provisioning-entitled systems. To schedule autoinstallations for these systems, select a distribution, identify the type (IP address or manual), and click Continue. Finish choosing from the options available on the subsequent screen. If any of the systems connect to SUSE Manager via a Proxy Server, choose either the *Preserve Existing Configuration* radio button or the *Use Proxy* radio button. If you choose to autoinstall through a Proxy Server, select from the available Proxies listed in the drop-down box beside the *Use Proxy* radio button. All of the selected systems will autoinstall through the selected Proxy. Click the Schedule Autoinstall button to confirm your selections. When the autoinstallations for the selected systems are successfully scheduled, the web interface returns you to the System Set Manager page.

System Set Manager > Provisioning > Tag Systems — [Prov]

Use this subtab to add meaningful descriptions to the most recent snapshots of your selected systems. To tag the most recent system snapshots, enter a descriptive term in the *Tag name* field and click the Tag Current Snapshots button.

System Set Manager > Provisioning > Rollback — [Prov]

Use this subtab to rollback selected Provisioning-entitled systems to previous snapshots marked with a tag. Click the name of the tag, verify the systems to be reverted, and click the Rollback Systems button.

System Set Manager > Provisioning > Remote Command — [Prov]

Use this subtab to issue remote commands on selected Provisioning-entitled systems. First create a `run` file on the client systems to allow this function to operate. Refer to the section called "*System Details* > *Details* > *Remote Command* — [Prov]" (page 67) for instructions. You may then identify a specific user, group, timeout period, and the script on this page. Select a date and time to perform the command, and click Schedule Remote Command.

System Set Manager > Misc — [Mgmt]

Misc — Update System Profiles and preferences for the system set through the following links:

System Set Manager > Misc > System Profile Updates — [Mgmt]

Click *Update Hardware Profile* followed by the Confirm Refresh button to schedule a hardware profile update. Clicking *Update Package Profile*,followed by the Confirm Refresh button schedules a package profile update.

System Set Manager > Misc > Custom System Information — [Prov]

Click *Set a custom value for selected systems* followed by the name of a key to allow you to provide values for all selected systems. Enter the information and click the Set

Values button. Click *Remove a custom value from selected systems* followed by the name of a key to allow you to remove values for all selected systems. Click the Remove Values button to finalize the deletion.

System Set Manager > Misc > Reboot Systems — [Mgmt]

Select the appropriate systems and click the Reboot Systems link to set those systems for reboot. To immediately cancel this action, click the *list of systems* link that appears within the confirmation message at the top of the page, select the systems, and click Unschedule Action.

System Set Manager > *Misc > Lock Systems* — [Mgmt]

Select the appropriate systems and click the Lock Systems link to prevent the scheduling of any action through SUSE Manager that affects the selected systems. This can be reversed by clicking the Unlock Systems link.

System Set Manager > Misc > Delete Systems — [Mgmt]

Click *Delete System Profiles*, then click the Confirm Deletions button to remove the selected profiles permanently.

System Set Manager > Misc > Add or Remove Add-On Entitlements — [Mgmt]

Select, via the radio button, whether to *Add*, *Remove*, or make *No Change* in the entitlements of the selected systems. Click the Change Entitlements button to confirm your selection.

System Set Manager > Misc > System Preferences — [Mgmt]

Toggle the *Yes* and *No* radio buttons and click the Change Preferences button to alter your notification preferences for the selected systems. You may apply these preferences to individual systems through the *Properties* subtab of the *System Details* page. Refer to the section called "*System Details > Details > Properties*" (page 66) for instructions.

- *Receive Notifications of Updates/Patches* — This setting keeps you abreast of all advisories pertaining to your systems. Any time an update is produced and released for a system under your supervision, a notification is sent via e-mail.

- *Include system in Daily Summary* — This setting includes the selected systems in a daily summary of system events. (By default, all Management and Provisioning systems are included in the summary.) These system events are actions that affect packages, such as scheduled patch updates, system reboots, or failures to check in. In addition to including the systems here, you must choose to receive e-mail notifications in the *Your Preferences* page. Refer to Section 3.3.2, "Your Preferences" (page 54) for instructions. Note that SUSE Manager sends these summaries only to verified e-mail addresses.

- *Automatic application of relevant Patches* — This setting enables the automatic application of patch updates to the selected systems. This means packages associated with patches are updated without any user intervention. Customers should note that SUSE Linux does not recommend the use of the auto-update feature for production systems because conflicts between packages and environments can cause system failures.

3.4.5 Advanced Search — [Mgmt]

The *System Search* page allows you to search through your systems according to specific criteria. These criteria include custom system information, system details, hardware, devices, interface, networking, packages, and location.

Searches can be refined using the *Fields to Search* drop-down menu, which is set to Name/Description by default.

The following list details the *Fields to Search* drop-down menu.

- *DMI Info* — The *Desktop Management Interface* (DMI) is a standard for management of components on computer system. You can search for SUSE Manager systems using the following DMI retrieval methods:

  - System — Product names or numbers, Manufacturer names, Serial numbers, and other information that may be unique to a system

  - BIOS — BIOS support information such as BIOS vendor name and version, hardware support enabled in the BIOS, and more

  - Asset Tag — A unique identifier assigned by an IT department (or vendor) to a system for better tracking, management and inventory

- *Location* — The physical location of a system, which includes the following:
    - Address — The address of the system or system set
    - Building — The building or site in an address
    - Room — The server or system room within a building
    - Rack — The designated location within a server room where a system is situated.
- *Details* — The unique identifiers assigned to a system by sytem administrators and particularly SUSE Manager Administrators, including the following:
    - Name/Description — The name assigned to a system by the SUSE Manager Administrator upon adding it to the SUSE Manager server.
    - ID — An identifier that is unique to a system or system set.
    - Custom Info — Information about the system that is unique only to that system.
    - Snapshot Tag — The name assigned to a new or previous system snapshot
    - Running Kernel — The currently running kernel on a system registered with SUSE Manager
- *Hardware* — Systems can be searched by particular components in the system, including the following:
    - CPU Model — The CPU model name (such as *Pentium* or *Athlon*
    - CPU MHz Less Than — Search systems with a processor less than a user-designated speed in Megahertz.
    - CPU MHz More Than — Search systems with a processor more than a user-designated speed in Megahertz.
    - Number of CPUs Less Than — Search systems with a sum of processors less than a user-designated quantity.
    - Number of CPUs Greater Than — Search systems with a sum of processors greater than a user-designated quantity.

  - RAM Less Than — Search systems with a sum of memory less than a user-designated quantity in megabytes.

  - RAM More Than — Search systems with a sum of memory more than a user-designated quantity in megabytes.

- *Packages* — Systems can be searched by the packages installed (and not yet installed) on the system.

  - Installed Packages — Filter systems based on particular installed packages

  - Needed Packages — Filter systems based on particular packages that have yet to be installed

- *Activity* — Systems can be searched by the amount of time since first or last checked into SUSE Manager.

  - Days Since Last Check-in — The amount of time (in days) that systems have last checked into SUSE Manager.

  - Days Since First Check-in — The amount of time (in days) that have passed since the systems first checked into SUSE Manager.

- *Network Info* — Systems can be searched based on specific networking details such as IP address.

  - Hostname — The name associated with a system registered with SUSE Manager.

  - IP Address — The network address of the system registered with SUSE Manager.

- *Hardware Devices* — Systems can be searched by specific hardware details such as driver names and Device or Vendor IDs.

  - Description — Device summary information, such as brand or model name/number (such as **`Intel 82801HBM/HEM`**)

  - Driver — The kernel driver or module name (such as **`tulip.o`** or `iwl3945`)

  - Device ID — The hexadecimal number corresponding to the device installed in the system.

- Vendor ID — The hexadecimal number corresponding to the vendor of the device installed in the system.

The Activity selections (*Days Since Last Checkin*, for instance) can be especially useful in finding and removing outdated System Profiles. Type the keyword, select the criterion to search by, use the radio buttons to identify whether you wish to query all systems or only those loaded in the *System Set Manager*, and click the Search button. You may also select the *Invert Result* checkbox to list those systems that do *not* match the criteria selected.

The results appear at the bottom of the page. For details about using the resulting system list, refer to Section 3.4.2, "Systems" (page 57).

3.4.6 Activation Keys — [Mgmt]

SUSE Manager Management and Provisioning customers with the Activation Key Administrator role (including SUSE Manager Administrators) can generate activation keys in the SUSE Manager Web interface. These keys can then be used to register a SUSE Linux Enterprise or Red Hat Enterprise Linux system, entitle the system to a SUSE Manager service level and subscribe the system to specific channels and system groups through the `rhnreg_ks` command line utility. Refer to Section 1.3.5, "Registering with Activation Keys" (page 37) for instructions on use.

NOTE

System-specific activation keys created through the *Reactivation* subtab of the *System Details* page are not part of this list because they are not reusable across systems.

Managing Activation Keys

To create an activation key:

Procedure 3.1 *Creating Activation Keys*

1. Select *Systems* from the top and then *Activation Keys* from the left navigation bar.

2. Click the *create new key* link at the upper right corner.

3. *Description* — Enter a *Description* to identify the generated activation key.

4. *Key* — In addition to the fields listed below, SUSE Manager customers may also populate the *Key* field itself. This user-defined string of characters can then be supplied with `rhnreg_ks` to register client systems with SUSE Manager. Refer to the section called “Using Multiple Activation Keys at Once — [Prov]” (page 97) for details.

   WARNING: Allowed Characters

   Do not insert commas in the key. All other characters are allowed. Commas are problematic since they are the separator used when including two or more activation keys at once.

5. *Usage Limit* — The maximum number of registered systems that can be registered with the activation key at any one time. Leave blank for unlimited use. Deleting a system profile reduces the usage count by one and registering a system profile with the key increases the usage count by one.

6. *Base Channel* — The primary channel for the key. This can be either the `SUSE Manager Default` channel or a custom base channel.

   Selecting `SUSE Manager Default` allows client systems to register with the default SUSE-provided channel that corresponds to their installed version of SUSE Linux Enterprise. You can also associate the key with a custom base channel. If a system using this key is not compatible with the selected channel, it will fall back to the SUSE Manager default channel.

7. *Add-on Entitlements* — The supplemental entitlements for the key, which includes Monitoring, Provisioning, Virtualization, and Virtualization Platform. All systems will be given these entitlements with the key.

8. *Universal default* — Whether or not this key should be considered the primary activation key for your organization.

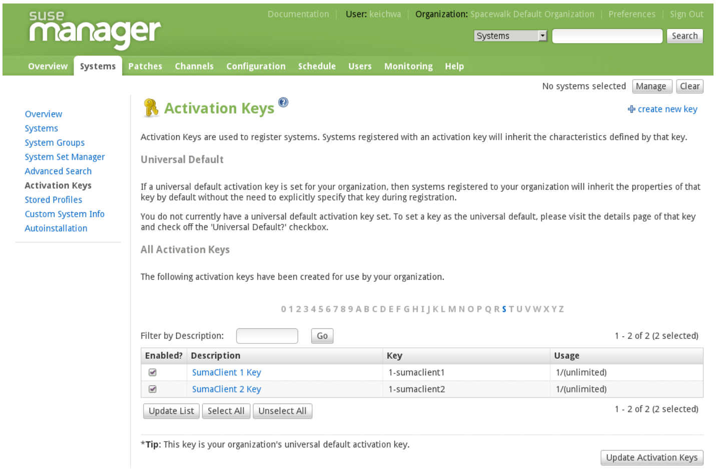
   WARNING: Changing the Default Activation Key

   Only one universal default activation key can be defined per organization. If a universal key already exists for this organization, you will unset the currently used universal key by activating the checkbox.

9 Click Create Key.

10 To create more activation keys, repeat the steps above.

Figure 3.5 *Activation Keys*



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 - 2 of 2 (2 selected)

Enabled?	Description	Key	Usage
☑	SumaClient 1 Key	1-sumaclient1	1/(unlimited)
☑	SumaClient 2 Key	1-sumaclient2	1/(unlimited)

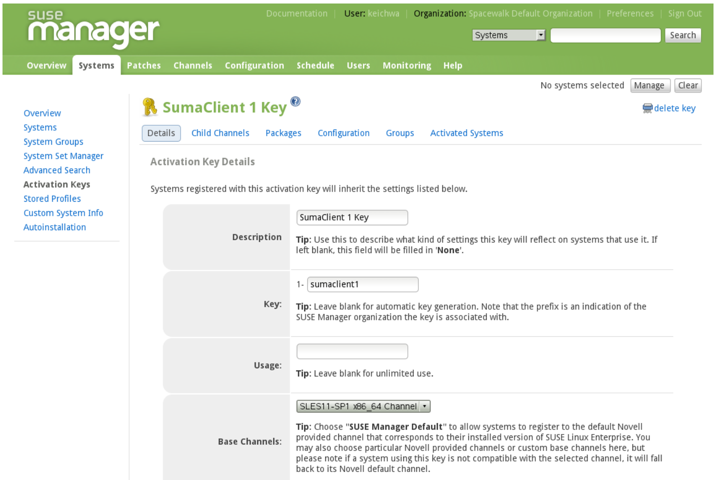
1 - 2 of 2 (2 selected)

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

After creating the unique key, it appears in the list of activation keys along with the number of times it has been used (see Figure 3.5, “Activation Keys” (page 96)). Note that only Activation Key Administrators can see this list. At this point, you may associate child channels (e.g., the Tools child channel), packages (e.g., the `rhncfg-actions` package) and groups with the key so that systems registered with it automatically subscribe to them.

To change information about a key, such as the channels or groups, click its description in the key list to display the key's *Datails* page (see Figure 3.6, “Activation Key Details With Subtabs” (page 97)), make your modifications in the appropriate tab, and click the Update Key button. To disassociate channels and groups from a key, deselect them in their respective menus by Ctrl-clicking their highlighted names. To remove a key entirely, click the *delete key* link in the upper right corner of the edit page.

Figure 3.6 Activation Key Details With Subtabs



SumaClient 1 Key

Activation Key Details

Systems registered with this activation key will inherit the settings listed below.

Description: SumaClient 1 Key

Tip: Use this to describe what kind of settings this key will reflect on systems that use it. If left blank, this field will be filled in '**None**'.

Key: 1- sumaclient1

Tip: Leave blank for automatic key generation. Note that the prefix is an indication of the SUSE Manager organization the key is associated with.

Usage:

Tip: Leave blank for unlimited use.

Base Channels: SLES11-SP1 x86_64 Channel

Tip: Choose "**SUSE Manager Default**" to allow systems to register to the default Novell provided channel that corresponds to their installed version of SUSE Linux Enterprise. You may also choose particular Novell provided channels or custom base channels here, but please note if a system using this key is not compatible with the selected channel, it will fall back to its Novell default channel.

A system may be set to subscribe to a base channel during registration with an activation key. However, if the activation key specifies a base channel that is not compatible with the operating system of the systems, the registration fails. For example, a SUSE Linux Enterprise Server for x86 system cannot register with an Activation Key that specifies a SUSE Linux Enterprise Server for x86_64 base channel. A system is always allowed to subscribe to a custom base channel.

To disable system activations with a key, unselect the corresponding checkbox under the *Enabled* column in the key list. The key can be re-enabled by selecting the checkbox. After making these changes, click the Update Keys button on the bottom right-hand corner of the page.

Using Multiple Activation Keys at Once — [Prov]

Provisioning customers should note that multiple activation keys can be included at the command line or in a single autoinstallation profile. This allows you to aggregate the aspects of various keys without recreating a new key specific to the desired systems, simplifying the registration and autoinstallation processes while slowing the growth of your key list.

Without this stacking ability, your organization would need at least six activation keys to manage four server groups and subscribe a server to any two groups. Factor in two versions of the operating system, such as Red Hat Enterprise Linux 4 and 5, and you need twice the number of activation keys. A larger organization would need keys in the dozens.

Registering with multiple activation keys requires some caution; conflicts between some values cause registration to fail. Conflicts in the following values do not cause registration to fail, a combination of values is applied: software packages, software child channels, and config channels. Conflicts in the remaining properties are resolved in the following manner:

- base software channels — registration fails

- entitlements — registration fails

- enable config flag — configuration management is set

Do not use system-specific activation keys along with other activation keys; registration fails in this event.

You are now ready to use multiple activation keys at once. This is done with comma separation at the command line with `rhnreg_ks` or in a kickstart profile within the *Activation Keys* tab of the *Autoinstallation Details* page. Refer to Section 1.3.5, "Registering with Activation Keys" (page 37) and the section called "Activation Keys — [Prov]" (page 115), respectively, for instructions.

3.4.7 Stored Profiles — [Mgmt]

SUSE Manager Provisioning customers can create package profiles through the *Profiles* subtab of the *Packages* tab within the *System Details* page. Those profiles are displayed on the *Stored Profiles* page, where they may be edited and even deleted.

To edit a profile, click its name in the list, alter its name and description, and click the Update Profile button. To view software associated with the profile, click the *Packages* subtab. To remove the profile entirely, click *delete stored profile* at the upper-right corner of the page.

3.4.8 Custom System Info — [Prov]

SUSE Manager Provisioning customers may include completely customizable information about their systems. Unlike notes, the information here is more formal and may be searched upon. For instance, you may decide to identify an asset tag for each system. To do this, you must create an **asset** key within the *Custom System Info* page.

Click *create new key* at the upper-right corner of the page. Enter a descriptive label and description, such as **Asset** and **Precise location of each system**, and click the Create Key. The key will then show up in the custom info keys list.

Once the key exists, you may assign a value to it through the *Custom Info* tab of the *System Details* page. Refer to the section called "*System Details* > *Details* > *Custom Info* — [Prov]" (page 69) for instructions.

mgr-custom-info

In addition to the SUSE Manager Web interface for creating and listing custom information keys, there is a command-line tool called mgr-custom-info (rhn-custom-info package) that performs the same actions at a shell prompt, for administrators who may not have access to the web interface.

The usage of mgr-custom-info is as follows:

```
mgr-custom-info options key1 value1
```

For example:

```
mgr-custom-info --username=admin --password=f00b4rb4z \
  --server-url=manager.example.com --list-values
```

The command lists the custom keys and their values for the manager.example.com SUSE Manager server.

For more information, refer to the help file by typing mgr-custom-info -h.

3.4.9 Autoinstallation — [Prov]

NOTE: Autoinstallation Types: AutoYaST and Kickstart

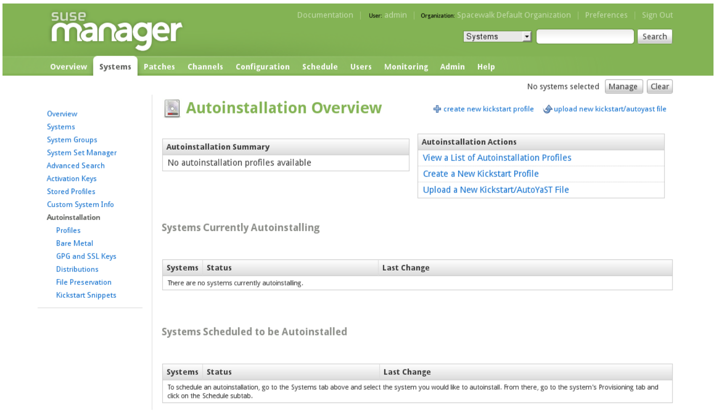
In the following section AutoYaST and AutoYaST features apply for SUSE Linux Enterprise client systems only. For RHEL systems, use Kickstart and Kickstart features.

AutoYaST and Kickstart configuration files allow administrators to create an environment for automating otherwise time-consuming system installations, such as multiple servers or workstations. AutoYaST files have to be uploaded to be managed with SUSE Manager. Kickstart files can be created, modified, and managed within and customized with the SUSE Manager Web interface.

SUSE Manager also features the Cobbler installation server that allows administrators to perform unattended installations using a Pre-Execution Environment (PXE) server, installation and configuration of full and para-virtualized guest systems, and re-installation of running systems. For more information on configuring Cobbler, refer to Chapter 6, *Cobbler* (page 203).

To satisfy the provisioning needs of customers, SUSE Manager provides an interface for developing Kickstart and AutoYaST profiles that can be used to install Red Hat Enterprise Linux or SUSE Linux Enterprise systems on either new or already-registered systems. This enables systems to be installed automatically to particular specifications.

Figure 3.7 *Autoinstallation Overview*



Autoinstallation Overview

Autoinstallation Summary
No autoinstallation profiles available

Autoinstallation Actions
View a List of Autoinstallation Profiles
Create a New Kickstart Profile
Upload a New Kickstart/AutoYaST File

Systems Currently Autoinstalling

Systems	Status	Last Change
There are no systems currently autoinstalling.		

Systems Scheduled to be Autoinstalled

Systems	Status	Last Change
To schedule an autoinstallation, go to the Systems tab above and select the system you would like to autoinstall. From there, go to the system's Provisioning tab and click on the Schedule subtab.		

This overview page displays the status of automated installation (Kickstart and AutoYaST) on your client systems: the types and number of profiles you have created and the progress of systems that are scheduled to be installed using Kickstart or AutoYaST. In the upper right is the *Autoinstallation Actions* section, which contains a series of links to management actions for your Kickstart or AutoYaST profiles. Before explaining the various automated installation options that are available from this page, the next two sections provide some introduction to the subject of AutoYaST and Kickstart.

Introduction to AutoYaST

Using AutoYaST, a system administrator can create a single file containing the answers to all the questions that would normally be asked during a typical installation of SUSE Linux Enterprise Server .

AutoYaST files can be kept on a single server system and read by individual computers during the installation. This installation method can support the use of a single AutoYaST file to install SUSE Linux Enterprise on multiple machines.

The *SUSE Linux Enterprise Server Deployment Guide* (`http://www.novell.com/documentation/sles11/book_sle_deployment/data/cha_deployment_autoinst.html`) contains an in-depth discussion of "Automated Installation" using AutoYaST.

AutoYaST Explained

When a machine is to receive a network-based AutoYaST installation, the following events must occur in this order:

1. After being placed on the network and turned on, the machine's PXE logic broadcasts its MAC address and a request to be discovered.

2. If a static IP address is not being used, the DHCP server recognizes the discovery request and extends an offer of network information needed for the new machine to boot. This includes an IP address, the default gateway to be used, the netmask of the network, the IP address of the TFTP or HTTP server holding the bootloader program, and the full path and file name of that program (relative to the server's root).

3. The machine applies the networking information and initiates a session with the server to request the bootloader program.

4. The bootloader, once loaded, searches for its configuration file on the server from which it was loaded itself. This file dictates which Kernel and Kernel options, such as the initial RAM disk (initrd) image, should be executed on the booting machine. Assuming the bootloader program is SYSLINUX, this file is located in the `pxelinux.cfg` directory on the server and named the hexadecimal equivalent of the new machine's IP address. For example, a bootloader configuration file for SUSE Linux Enterprise Server should contain:

   ```
   port 0
   prompt 0
   timeout 1
   default autoyast
   label autoyast
     kernel vmlinuz
     append autoyast=http://my_susemanager_server/path \
       install=http://my_susemanager_server/repo_tree
   ```

5. The machine accepts and uncompresses the initrd and kernel, boots the kernel, fetches the instsys from the install server and initiates the AutoYaST installation with the options supplied in the bootloader configuration file, including the server containing the AutoYaST configuration file.

6. The new machine is built based upon the parameters established within the AutoYaST configuration file.

AutoYaST Prerequisites

Some preparation is required for your infrastructure to handle AutoYaST installations. For instance, before creating AutoYaST profiles, you may consider:

- A DHCP server is not required for AutoYaST, but it can make things easier. If you are using static IP addresses, you should select static IP while developing your AutoYaST profile.

- Host the AutoYaST distribution trees via HTTP, preperably provided by SUSE Manager.

- If conducting a Bare Metal AutoYaST installation, you should do the following:

  - Configure DHCP to assign required networking parameters and the bootloader program location.

- Specify within the bootloader configuration file the Kernel to be used and appropriate Kernel options.>

Building Bootable AutoYaST ISOs

While you can schedule a registered system to be installed by AutoYaST to a new operating system and package profile, it is also useful to be able to install automatically a system that is not registered with SUSE Manager, or does not yet have an operating system installed. One common method of doing this is to create a bootable CD-ROM that is inserted into the target system. When the system is rebooted, it boots from the CD-ROM, loads the AutoYaST configuration from your SUSE Manager, and proceeds to install SUSE Linux Enterprise Server according to the AutoYaST profile you have created.

To do this, copy the contents of `/loader` (e.g., `/boot/i386/loader/`) from the installation medium of the target distribution. Then edit the `isolinux.cfg` file to default to `autoyast` and add an `autoyast` section:

```
label autoyast
kernel vmlinuz
  append textmode=1 autoyast=url initrd=initrd \
    install=url_repo_tree
```

The AutoYaST distribution selected by the IP range should match the distribution from which you are building, otherwise errors will occur.

Next, you may customize `isolinux.cfg` according to your needs, for example, by adding multiple AutoYaST options, different boot messages, shorter timeout periods, etc.

Next, issue the command:

```
mkisofs -o file.iso -b isolinux.bin -c boot.cat -no-emul-boot \
  -boot-load-size 4 -boot-info-table -R -J -v -T loader/
```

Note that `loader/` is the relative path to the directory containing the isolinux files from the distribution medium, while `file.iso` is the output ISO file, which is placed into the current directory.

You may then burn the ISO to CD-ROM. To use the disc (assuming you left the label for the autoyast boot as 'autoyast'), boot the system and type "autoyast" at the prompt. When you press Enter, the AutoYaST installation begins.

For more information about image creation, refer to the *SUSE Linux Enterprise Server Deployment Guide*, Part "Imaging and Creating Products".

Integrating AutoYaST with PXE

In addition to CD-ROM-based installations, AutoYaST installation through a Pre-Boot Execution Environment (PXE) is supported. This is less error-prone than CDs, enables AutoYaST installation from Bare Metal, and integrates with existing PXE/DHCP environments.

To use this method, make sure your systems have network interface cards (NIC) that support PXE, install and configure a PXE server, ensure DHCP is running, and place the installation repository on an HTTP server for deployment. Finally upload the AutoYaST profile with the Web interface to the SUSE Manager server. Once the AutoYaST profile has been created, use the URL from the *Autoinstallation Overview* page, as for CD-ROM-based installations.

To obtain specific instructions for conducting PXE AutoYaST installation, refer to the *Using PXE Boot* section of the *SUSE Linux Enterprise Deployment Guide*.

Starting with the section called “Autoinstallation Profiles (Kickstart and AutoYaST)” (page 108), AutoYaST options available from the *Systems* > *Kickstart* are described.

Introduction to Kickstart

Using Kickstart, a system administrator can create a single file containing the answers to all the questions that would normally be asked during a typical installation of Red Hat Enterprise Linux.

Kickstart files can be kept on a single server system and read by individual computers during the installation. This installation method can support the use of a single Kickstart file to install Red Hat Enterprise Linux on multiple machines.

The *Red Hat Enterprise Linux System Administration Guide* contains an in-depth discussion of kickstart (`http://www.redhat.com/docs/manuals/enterprise/`).

Kickstart Explained

When a machine is to receive a network-based kickstart, the following events must occur in this order:

1. After being placed on the network and turned on, the machine's PXE logic broadcasts its MAC address and a request to be discovered.

2. If a static IP address is not being used, the DHCP server recognizes the discovery request and extends an offer of network information needed for the new machine to boot. This includes an IP address, the default gateway to be used, the netmask of the network, the IP address of the TFTP or HTTP server holding the bootloader program, and the full path and file name of that program (relative to the server's root).

3. The machine applies the networking information and initiates a session with the server to request the bootloader program.

4. The bootloader, once loaded, searches for its configuration file on the server from which it was itself loaded. This file dictates which kernel and kernel options, such as the initial RAM disk (initrd) image, should be executed on the booting machine. Assuming the bootloader program is SYSLINUX, this file is located in the `pxelinux.cfg` directory on the server and named the hexadecimal equivalent of the new machine's IP address. For example, a bootloader configuration file for Red Hat Enterprise Linux AS 2.1 should contain:

   ```
   port 0
   prompt 0
   timeout 1
   default My_Label
   label My_Label
         kernel vmlinuz
         append ks=http://my_susemanager_server/path \
             initrd=initrd.img network apic
   ```

5. The machine accepts and uncompresses the init image and kernel, boots the kernel, and initiates a Kickstart installation with the options supplied in the bootloader configuration file, including the server containing the Kickstart configuration file.

6. This kickstart configuration file in turn directs the machine to the location of the installation files.

7. The new machine is built based upon the parameters established within the Kickstart configuration file.

Kickstart Prerequisites

Some preparation is required for your infrastructure to handle kickstarts. For instance, before creating Kickstart profiles, you may consider:

- A DHCP server is not required for kickstarting, but it can make things easier. If you are using static IP addresses, you should select static IP while developing your Kickstart profile.
- An FTP server can be used in place of hosting the Kickstart distribution trees via HTTP.
- If conducting a bare metal kickstart, you should 1)Configure DHCP to assign required networking parameters and the bootloader program location. 2)Specify within the bootloader configuration file the kernel to be used and appropriate kernel options.

Building Bootable Kickstart ISOs

While you can schedule a registered system to be kickstarted to a new operating system and package profile, it is also useful to be able to kickstart a system that is not registered with SUSE Manager, or does not yet have an operating system installed. One common method of doing this is to create a bootable CD-ROM that is inserted into the target system. When the system is rebooted, it boots from the CD-ROM, loads the kickstart configuration from your SUSE Manager, and proceeds to install Red Hat Enterprise Linux according to the Kickstart profile you have created.

To do this, copy the contents of `/isolinux` from the first CD-ROM of the target distribution. Then edit the `isolinux.cfg` file to default to 'ks'. Change the 'ks' section to the following template:

```
label ks
kernel vmlinuz
  append text ks=url initrd=initrd.img lang= devfs=nomount \
    ramdisk_size=16438 ksdevice
```

IP addressed-based kickstart URLs will look something like this:

```
http://my.manager.server/kickstart/ks/mode/ip_range
```

The kickstart distribution selected by the IP range should match the distribution from which you are building, or errors will occur. *`ksdevice`* is optional, but looks like:

```
ksdevice=eth0
```

It is possible to change the distribution for a Kickstart profile within a family, such as Red Hat Enterprise Linux AS 4 to Red Hat Enterprise Linux ES 4, by specifying the new distribution label. Note that you cannot move between versions (4 to 5) or between updates (U1 to U2).

Next, you may customize `isolinux.cfg` further for your needs, such as by adding multiple Kickstart options, different boot messages, shorter timeout periods, etc.

Next, create the ISO as described in the *Making an Installation Boot CD-ROM* section of the *Red Hat Enterprise Linux Installation Guide*. Alternatively, issue the command:

```
mkisofs -o file.iso -b isolinux.bin -c boot.cat -no-emul-boot \
  -boot-load-size 4 -boot-info-table -R -J -v -T isolinux/
```

Note that `isolinux/` is the relative path to the directory containing the isolinux files from the distribution CD, while `file.iso` is the output ISO file, which is placed into the current directory.

You may then burn the ISO to CD-ROM. To use the disc (assuming you left the label for the Kickstart boot as 'ks'), boot the system and type "ks" at the prompt. When you press Enter, Kickstart starts running.

Integrating Kickstart with PXE

In addition to CD-ROM-based installs, Kickstart supports through a Pre-Boot Execution Environment (PXE) are supported. This is less error-prone than CDs, enables kickstarting from bare metal, and integrates with existing PXE/DHCP environments.

To use this method, make sure your systems have network interface cards (NIC) that support PXE, install and configure a PXE server, ensure DHCP is running, and then place the appropriate files on an HTTP server for deployment. Once the kickstart profile has been created, use the URL from the *Kickstart Details* page, as for CD-ROM-based installs.

To obtain specific instructions for conducting PXE kickstarts, refer to the *PXE Network Installations* chapter of the *Red Hat Enterprise Linux 4 System Administration Guide*.

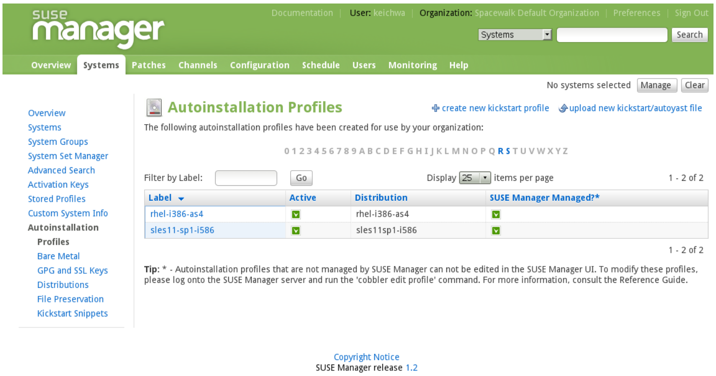
NOTE: Tip

Upon running the Network Booting Tool as described in the Red Hat Enterprise Linux 4: System Administration Guide, ensure that you select "HTTP" as the protocol and include the domain name of the SUSE Manager in the Server field if you intend to use it to distribute the installation files.

The following sections describe the autoinstallation options available from the *Systems* > *Autoinstallation* page.

Autoinstallation Profiles (Kickstart and AutoYaST)

Figure 3.8 *Profiles*



Autoinstallation Profiles

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

Label	Active	Distribution	SUSE Manager Managed?*
rhel-i386-as4	✓	rhel-i386-as4	✓
sles11-sp1-i586	✓	sles11sp1-i586	✓

1 - 2 of 2

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

This page lists all profiles for your organization, whether those profiles are active, and the distribution tree to which that profile is associated. You can either create a new Kickstart profile by clicking the *create new kickstart profile* link, upload or paste the contents of a new profile using the *upload new kickstart/autoyast file*, or edit an existing Kickstart profile by clicking the name of the profile. Note, you can only update AutoYaST profiles using the upload button. You can also view AutoYaST in the edit box or change the virtualization type using the selection list.

Create a New Kickstart Profile

Click on the *create new kickstart profile* link from the *Systems* > *Autoinstallation* page to start the brief wizard that populates the base values needed for a Kickstart profile.

Procedure 3.2 *Creating a New Kickstart Profile*

1 On the first line, enter a Kickstart profile label. This label cannot contain spaces, so use dashes (-) or underscores (_) as separators.

2 Select a *Base Channel* for this profile, which consists of packages based on a specific architecture and Red Hat Enterprise Linux release.

3 Select a *Autoinstallable Tree* for this profile. The autoinstallable tree drop-down menu is only populated if one or more distributions have been created for the selected base channel.

4 Select the *Virtualization Type* from the drop-down menu.

5 On the second page, select (or enter) the location of the Kickstart tree.

6 On the third page, select a root password for the system.

Depending on your base channel, your newly created Kickstart profile may be subscribed to a channel that is missing required packages. In order for kickstart to work properly, the following packages should be present in its base channel: `pyOpenSSL`, `rhnlib`, `libxml2-python`, and `spacewalk-koan` and associated packages.

To resolve this issue, ensure that the following items are correct:

- Make sure that the Tools software channel for the Kickstart profile's base channel is available to your organization. If it is not, you must request entitlements for the Tools software channel from the SUSE Manager administrator.

- Make sure that the Tools software channel for this Kickstart profile's base channel is available to your SUSE Manager as a child channel.

- Make sure that `rhn-kickstart` and associated packages corresponding to this kickstart are available in the Tools child channel.

The final stage of the wizard presents the *Autoinstallation Details* > *Details* tab. On this tab and the other subtabs, nearly every option for the new Kickstart profile can be customized.

Once created, you can access the Kickstart profile by downloading it from the *Autoinstallation Details* page by clicking the *Autoinstallation File* subtab and clicking the *Download Autoinstallation File* link.

If the Kickstart file is *not* managed by SUSE Manager, you can access it using by via the following URL path:

```
http://my.manager.server/ks/dist/ks-rhel-ARCH-VARIANT-VERSION
```

In the above example, *ARCH* is the architecture of the Kickstart file, *VARIANT* is either **client** or **server**, and *VERSION* is the release of Red Hat Enterprise Linux associated with the Kickstart file.

The following sections describe the options available on each subtab.

Autoinstallation Details > Details — [Prov]

Figure 3.9 *Autoinstallation Details*

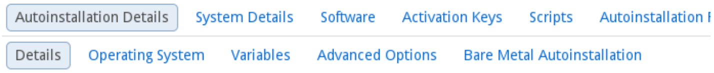


Figure 3.9, “Autoinstallation Details” (page 110) shows the subtabs that are available from the *Autoinstallation Details* tab. From the *Autoinstallation Details* > *Details* subtab, you can:

- Rename the profile.

- Change the operating system it installs by clicking *(Change)*.

- Change the *Virtualization Type*.

> **NOTE**
>
> Changing the *Virtualization Type* may require changes to the Kickstart profile bootloader and partition options, potentially overwriting user customizations. Consult the *Partitioning* tab to verify any new or changed settings.

- Change the amount of *Virtual Memory* (in Megabytes of RAM) allocated to virtual guests autoinstalled with this profile.

- Change the number of *Virtual CPUs* for each virtual guest.

- Change the the *Virtual Storage Path* from the default in `/var/lib/xen/`.

- Change the amount of *Virtual Disk Space* (in GB) alloted to each virtual guest.

- Change the *Virtual Bridge* for networking of the virtual guest.

- Deactivate the profile so that it cannot be used to schedule a kickstart by removing the *Active* checkmark.

- Check whether to enable logging for custom `%post` scripts to the `/root/ks-post.log` file.

- Check whether to enable logging for custom `%pre` scripts to the `/root/ks-pre.log` file.

- Check whether to preserve the `ks.cfg` file and all `%include` fragments to the `/root/` directory of all systems autoinstalled with this profile.

- Select whether this profile is the default for all of your organization's kickstarts by checking or unchecking the box.

- Add any *Kernel Options* in the corresponding text box.

- Add any *Post Kernel Options* in the corresponding text box.

- Enter comments that are useful to you in distinguishing this profile from others.

Autoinstallation Details > Operating System — [Prov]

From this page, you can make the following changes to the operating system that the Kickstart profile installs:

Change the base channel
: Select from the available base channels. SUSE Manager administrators can see a list of all base channels that are currently synced to the SUSE Manager.

Child Channels
: Subscribe to any available child channels of the base channel, such as the Tools channel.

Available Trees
: Use the drop-down menu to choose the available trees that are associated with the base channel.

Software URL (File Location)

The exact location from which the Kickstart tree is mounted. This value is determined when the profile is created. You can view it on this page but you cannot change it.

Autoinstallation Details > Variables

Kickstart variables can be used to substitute values into Kickstart profiles. To define a variable, create a name-value pair (`name/value`) in the text box.

For example, if you wanted to kickstart a system that joins the network for specified department (for example the Engineering organization) you can create a profile variable to set the ip address and the gateway server address to a variable that any system using that profile will use. Add the following line to the *Variables* text box.

```
IPADDR=192.168.0.28
GATEWAY=192.168.0.1
```

To use the profile variable, you can use the name of the variable within the profile to substitute in the value. For example, the `network` portion of a Kickstart file looks like the following:

```
network --bootproto=static --device=eth0 --onboot=on --ip=$IPADDR \
  --gateway=$GATEWAY
```

The `$IPADDR` will be **`192.168.0.28`**, and the `$GATEWAY` will be **`192.168.0.1`**

NOTE

There is a hierarchy when creating and using variables in Kickstart files. System Kickstart variables take precedence over *Profile* variables, which in turn take precendence over *Distribution* variables. Understanding this hierarchy can alleviate confusion when using variables in kickstarts.

Using variables are just one part of the larger Cobbler infrastructure for creating templates that can be shared between multiple profiles and systems. For more information about Cobbler and Kickstart templates, refer to Chapter 6, *Cobbler* (page 203).

Autoinstallation Details > Advanced Options — [Prov]

From this page, you can toggle several installation options on and off by checking and unchecking the boxes to the left of the option. For most installations, the default options are correct. The *Red Hat Enterprise Linux System Administration Guide* discusses each of these options in detail.

Autoinstallation Details > Bare Metal Autoinstallation — [Prov]

This subtab provides the information necessary to Kickstart systems that are not currently registered with SUSE Manager. Using the on-screen instructions, you may either autoinstall systems using boot media (CD-ROM) or by IP address.

System Details > Details — [Prov]

Figure 3.10 *System Details*

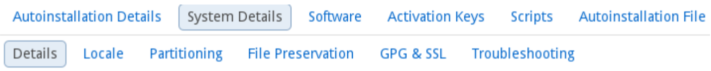


Figure 3.10, “System Details” (page 113) shows the subtabs that are available from the *System Details* tab.

From the *System Details* > *Details* subtab, you can:

- Select from DHCP and static IP, depending on your network.

- Choose the level of SELinux that is configured on kickstarted systems.

- Enable configuration management or remote command execution on kickstarted systems.

- Change the root password associated with this profile.

System Details > Locale — [Prov]

From this subtab, you can change the timezone associated with kickstarted systems.

System Details > Partitioning — [Prov]

From this subtab, you can indicate the partitions that you wish to be created during installation. For example:

```
partition /boot --fstype=ext3 --size=200
partition swap --size=2000
partition pv.01 --size=1000 --grow
volgroup myvg pv.01 logvol / --vgname=myvg --name=rootvol --size=1000 --grow
```

System Details > File Preservation — [Prov]

If you have previously created a file preservation list, you may include that list as part of the kickstart. This will prevent the files in that list from being over-written during the installation process. Refer to the section called “*Autoinstallation > File Preservation* — [Prov]” (page 120) for information on how to create a file preservation list.

System Details > GPG & SSL — [Prov]

From this subtab, select the GPG keys and/or SSL certificates to be imported to the kickstarted system during the %post section of the kickstart. For SUSE Manager customers, this list includes the SSL Certificate used during the installation of SUSE Manager.

NOTE

Any GPG key you wish to import to the kickstarted system must be in ASCII rather than binary format.

System Details > Troubleshooting — [Prov]

From this subtab, you can change information that may help with troubleshooting hardware problems:

Bootloader
: For some headless systems, it is better to select the non-graphic LILO bootloader.

Kernel Parameters
: Enter kernel parameters here that may help to narrow down the source of hardware issues.

Software > Package Groups — [Prov]

Figure 3.11 *Software*

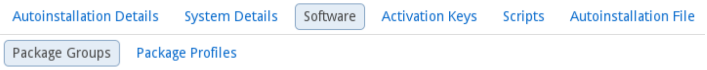


Figure 3.11, “Software” (page 114) shows the sub-tabs that are available from the *Software* tab.

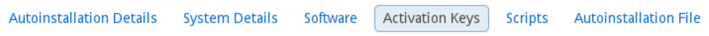
Enter the package groups, such at `@office` or `@admin-tools` you would like to install on the kickstarted system in the large text box on this page. If you would like to know what package groups are available, and what packages they contain, refer to the `RedHat/base/` file of your Kickstart tree.

Software > Package Profiles — [Prov]

If you have previously created a Package Profile from one of your registered systems, you can use that profile as a template for the files to be installed on a kickstarted system. Refer to the section called “*System Details > Software > Packages*” (page 70) for more information about package profiles.

Activation Keys — [Prov]

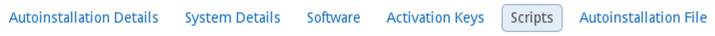
Figure 3.12 *Activation Keys*



The *Activation Keys* tab, which has no subtabs, allows you select Activation Keys to include as part of the Kickstart profile. These keys, which must have been created previous to creating the Kickstart profile, will be used when re-registering kickstarted systems.

Scripts — [Prov]

Figure 3.13 *Scripts*



The *Scripts* tab, which has no subtabs, is where %pre and %post scripts are created. This page lists any scripts that have already been created for this Kickstart profile. To create a new Kickstart script:

1. Click the *add new kickstart script* link in the upper right.

2. Enter the path to the scripting language used to create the script, such as `/usr/bin/perl`.

3. Enter the full script in the large text box.

4. Indicate whether this script is to be executed in the %pre or %post section of the Kickstart process.

5. Indicate whether this script is to run outside of the chroot environment. Refer to the *Post-installation Script* section of the *Red Hat Enterprise Linux System Administration Guide* for further explanation of the `nochroot` option.

NOTE

SUSE Manager supports the inclusion of separate files within the Partition Details section of the Kickstart profile. For instance, you may dynamically generate a partition file based on the machine type and number of disks at kickstart time. This file can be created via %pre script and placed on the system, such as `/tmp/part-include`. Then you can call for that file by including the following line within the Partition Details field of the *System Details* > *Partitioning* tab:

```
%include /tmp/part-include
```

Autoinstallation File — [Prov]

Figure 3.14 *Autoinstallation File*

The *Autoinstallation File* tab, which has no subtabs, allows you to view or download the profile that has been generated from the options chosen in the previous tabs.

Upload a New Kickstart/AutoYaST File

Click on the *upload new kickstart/autoyast file* link from the *Systems* > *Autoinstallation* page to upload an externally prepared AutoYaST or Kickstart profile.

1 On the first line, enter a profile *Label* for the automated installation. This label cannot contain spaces, so use dashes (-) or underscores (_) as separators.

2 Select a *Autoinstallable Tree* (installation data) for this profile. The *autoinstallable Tree* drop-down menu is only populated if one or more distributions have been created for the selected base channel.

3. Select the *Virtualization Type* from the drop-down menu.

   > **NOTE**
   >
   > If you do not intend to use the autoinstall profile to create virtual guest systems, you can leave the drop-down at the default *KVM Virtualized Guest* choice.

4. Finally, either provide the file contents with cut-and-paste or update the file from the local storage medium:

   - Paste it into the *File Contents* box and click *Create*, or
   - enter the file name in the *File to Upload* field and click *Upload File*.

Once done, four subtabs are available: *Details* (see the section called “*System Details* > *Details* — [Prov]” (page 113)), *Bare Metal Kickstart* (see the section called “*Autoinstallation Details* > *Bare Metal Autoinstallation* — [Prov]” (page 113)),*Variables* (see the section called “*Autoinstallation Details* > *Variables*” (page 112)), and *Autoinstallable File* (see the section called “Autoinstallation File — [Prov]” (page 116)) are available.

Autoinstallation > Bare Metal — [Prov]

Lists the IP addresses that have been associated with the profiles created by your organization. Click either the range or the profile name to access different tabs of the *Autoinstallation Details* page.

Autoinstallation > GPG and SSL Keys — [Prov]

Lists keys and certificates available for inclusion in kickstart profiles and provides a means to create new ones. This is especially important for customers of SUSE Manager or the Proxy Server because systems kickstarted by them must have the server key imported into SUSE Manager and associated with the relevant kickstart profiles. Import it by creating a new key here and then make the profile association in the *GPG and SSL keys* subtab of the *Autoinstallation Details* page.

To develop a new key/certificate, click the *create new stored key/cert* link in the upper-right corner of the page. Enter a description, select the type, upload the file, and click the Update Key button. Note that a unique description is required.

IMPORTANT

The GPG key you upload to SUSE Manager must be in ASCII format. Using a GPG key in binary format causes anaconda, and therefore the kickstart process, to fail.

Autoinstallation > Distributions — [Prov]

The *Distributions* page enables you to find and create custom installation trees that may be used for automated installations.

NOTE

The *Distributions* page does not display distributions already provided. They can be found within the *Distribution* dropdown menu of the *Autoinstallation Details* page.

Before creating a distribution, you must make an installation tree available, as described in the *Automated Installation* chapter of the *SUSE Linux Enterprise Deployment Guide* or, respectively, the *Kickstart Installations* chapter of the *Red Hat Enterprise Linux System Administration Guide*. This tree must be located in a local directory on the SUSE Manager server.

Procedure 3.3 *Creating Distribution for Autoinstallation*

1 To create a new distribution, on the *Autoinstallable Distributions* click *create new distribution* in the upper right corner.

2 On the *Create Autoinstallable Distribution* page, provide the following data:

  2a Enter a label (without spaces) in the *Distribution Label* field, such as **`my-orgs-sles-11-sp1`** or **`my-orgs-rhel-as-5`**.

  2b In the *Tree Path* field, paste the path to the base of the installation tree. (For Red Hat Enterprise Linux systems, you can test this by appending "images/pxe-boot/README" to the URL in a Web browser, pressing Enter, and ensuring that the readme file appears.)

2c Select the matching distribution from the *Base Channel* and *Installer Generation* dropdown menus, such as **>SUSE Linux** for SUSE Linux Enterprise, or **Red Hat Enterprise Linux 5** for Red Hat Enterprise Linux 5 client systems.

3 When finished, click the Create Autoinstallable Distribution button.

Autoinstallation > Distributions > Variables

Autoinstallation variables can be used to substitute values into Kickstart profiles; this feature does not apply for AutoYaST, which supports rule based autoinstallations. To define a variable, create a name-value pair (*name/value*) in the text box.

For example, if you wanted to kickstart a system that joins the network for specified department (for example the Engineering organization) you can create a profile variable to set the ip address and the gateway server address to a variable that any system using that profile will use. Add the following line to the *Variables* text box.

```
IPADDR=192.168.0.28
GATEWAY=192.168.0.1
```

To use the distribution variable, you can use the name of the variable within the profile to substitute in the value. For example, the `network` portion of a kickstart file looks like the following:

```
network --bootproto=static --device=eth0 --onboot=on --ip=$IPADDR \
  --gateway=$GATEWAY
```

The `$IPADDR` will be **192.168.0.28**, and the `$GATEWAY` will be **192.168.0.1**

NOTE

There is a hierarchy when creating and using variables in Kickstart files. System Kickstart variables take precedence over Profile variables, which in turn take precendence over Distribution variables. Understanding this hierarchy can alleviate confusion when using variables in kickstarts.

Using variables are just one part of the larger Cobbler infrastructure for creating templates that can be shared between multiple profiles and systems. For more information about Cobbler and Kickstart templates, refer to Chapter 6, *Cobbler* (page 203).

Autoinstallation > File Preservation — [Prov]

Collects lists of files to be protected and re-deployed on systems during kickstart. For instance, if you have many custom configuration files located on a system to be kickstarted, enter them here as a list and associate that list with the Kickstart profile to be used.

To use this feature, click the *create new file preservation list* link at the top and enter a relevant label and all files and directories to be preserved on the resulting page. Enter absolute paths to all files and directories. Then click Create List.

IMPORTANT

Although file preservation is useful, it does have limitations. First, each list is limited to a total size of 1 MB. Further, special devices like `/dev/hda1` and `/dev/sda1` are not supported. Finally, only file and directory names may be entered. No regular expression wildcards can be included.

When finished, you may include the file preservation list in the Kickstart profile to be used on systems containing those files. Refer to the section called “Create a New Kickstart Profile” (page 108) for precise steps.

Autoinstallation > Kickstart Snippets — [Prov]

Use Kickstart snippets to store common blocks of code that can be shared across multiple Kickstart profiles in SUSE Manager. When you create a Kickstart snippet, all Kickstart profiles including that snippet will be updated accordingly.

3.5 Patches

Select the *Patches* tab from the top navigation bar to track the availability and application of patches to your managed systems.

The first page to appear is the *Patches Overview* page. This page displays relevant patches, which apply to at least one system to which you have administrative access and that have not yet been applied.

NOTE: Receiving Patches for Your System

To receive an email when patches are issued for your system, go to *Overview > Your Preferences* and select *Receive email notifications*.

SUSE distinguishes three types of patches: security updates, bug fix updates, and enhancement updates. Each patch is comprised of a summary of the problem and a solution, including the RPM packages required to fix the problem.

Icons are used to identify the three types:

- ❗ — Security Updates available, *strongly* recommended
- 🐞 — Bug Fix Updates available, recommended
- ➕ — Enhancement Updates available, optional

A summary of each patch is provided in list form. This view instantly informs you of the type, severity (for security updates), and subject of the patch, as well as the number of affected systems.

In addition to the pages described within this chapter, you may view patches by product line at the following location: `http://download.novell.com/patch/psdb/`. An RSS feed with security updates is available at `http://www.novell.com/linux/security/suse_security.xml`.

3.5.1 Relevant Patches

The *Relevant Patches* page displays a customized list of patches that applies to your registered systems. The list provides a summary of each patch, including its type, severity (for security updates), advisory number, synopsis, systems affected, and date updated.

Clicking on *Advisory* takes you to the *Details* tab of the *Patch Details* page. Clicking on the number of associated systems takes you to the *Affected Systems* tab of the *Patch Details* page. Refer to the section called “Patch Details” (page 123) for more information.

3.5.2 All Patches

The *All Patches* page displays a list of all patches released by SUSE. It works much the same as the *Relevant Patches* page in that clicking either *Advisory* or the number of systems affected takes you to related tabs of the *Patch Details* page. Refer to the section called “Patch Details” (page 123) for more information.

Apply Patches

Patches include a list of updated packages. To apply patches to a system, the system must be entitled.

Apply all applicable patches to a system by clicking on *Systems* > *Systems* in the top and left navigation bars. Click on the name of an entitled system, and click the *Patches* tab of the resulting *System Details* page. When the relevant patch list appears, click Select All and then Apply Patches on the bottom right-hand corner of the page. Only those patches that have not been scheduled, were scheduled and failed, or were canceled are listed. Updates already pending are excluded from the list.

In addition, management users can apply patches using two other methods:

- To apply a specific patch to one or more systems, find the update within the patch lists. In the table, click on the number of systems affected, which takes you to the *Affected Systems* tab of the *Patch Details* page. Select the individual systems to be updated and click the Apply Patches button. Double-check the systems to be updated on the confirmation page, then click the Confirm button.

- To apply more than one patch to one or more systems, select the systems from a *Systems* list and click the Update List button. Click the *System Set Manager* link in the left navigation bar, then click the *Systems* tab. After ensuring the appropriate systems are selected, click the *Patch* tab, select the patches to apply, and click the Apply Patch button. You can select to apply the patch as soon as possible or schedule a date and time for the patch to occur. Then click the Schedule Updates button. You can follow the progress of the patch through the *Pending Actions* list. Refer to Section 3.8, “Schedule” (page 144) for more details.

IMPORTANT

If you use scheduled package installation, the packages are installed via the SUSE Manager daemon. You must enable the SUSE Manager daemon on your systems. Refer to Chapter 2, *SUSE Manager Daemon* (page 41) for more details.

The following rules apply to patches:

- Each package is a member of one or more channels. If a selected system is not subscribed to a channel containing the package, the package will not be installed on that system.

- If a newer version of the package is already on the system, the package will not be installed on that system.

- If an older version of the package is installed, the package will be upgraded.

Patch Details

If you click on the advisory of a patch in the *Relevant* or *All* pages, its *Patch Details* page appears. This page is further divided into the following tabs:

Patch Details > Details

This subtab displays the patch report issued by SUSE. It provides a synopsis of the patch first, including the severity (for security updates), issue date, and any update dates. This is followed by brief and detailed descriptions of the patch and the steps required to resolve the issue.

Below the *Affected Channels* label, all channels that contain the affected package are listed. Clicking on a channel name displays the *Packages* subtab of the *Channel Details* page for that channel. Refer to the section called “Software Channel Details” (page 129) for more information.

Security updates list the specific vulnerability as tracked by `http://cve.mitre.org`. This information is listed below the *CVEs* label.

OVAL is an open vulnerability and assessment language promoted by Mitre, `http://oval.mitre.org`. Clicking on the link below the *Oval* label downloads this information to your system. More useful is the collected Novell/SUSE Linux security updates on `http://support.novell.com/security/cve/`.

Patch Details > Packages

This subtab provides links to each of the updated RPMs broken down by channel. Clicking on the name of a package displays its *Package Details* page.

Patch Details > Affected Systems

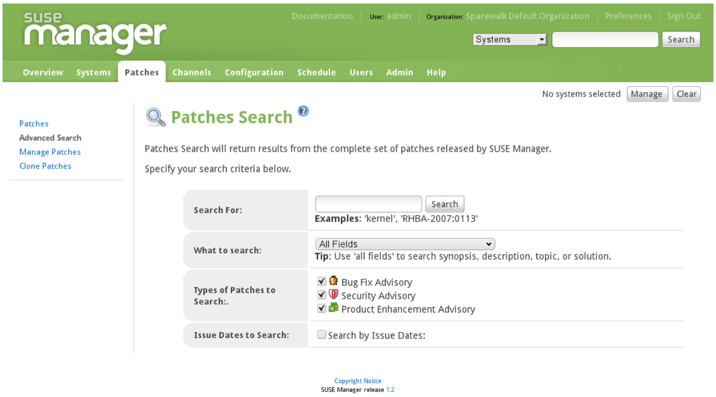
This subtab lists systems affected by the patches. You can apply updates here. (See the section called “Apply Patches” (page 122).) Clicking on the name of a system takes you to its *System Details* page. Refer to the section called “System Details” (page 61) for more information.

To help users determine whether an update has been scheduled, a Status column exists within the affected systems table. Possible values are: None, Pending, Picked Up, Completed, and Failed. This column identifies only the latest action related to a patch. For instance, if an action fails and you reschedule it, this column shows the status of the patch as pending (with no mention of the previous failure). Clicking a status other than None takes you to the *Action Details* page. This column corresponds to one on the *Patch* tab of the *System Details* page.

3.5.3 Advanced Search

The *Patch Search* page allows you to search through patches according to specific criteria.

Figure 3.15 *Patch Search*



Patches Search

Patches Search will return results from the complete set of patches released by SUSE Manager.

Specify your search criteria below.

Search For:	Search **Examples:** 'kernel', 'RHBA-2007:0113'
What to search:	All Fields **Tip:** Use 'all fields' to search synopsis, description, topic, or solution.
Types of Patches to Search:.	☑ Bug Fix Advisory ☑ Security Advisory ☑ Product Enhancement Advisory
Issue Dates to Search:	☐ Search by Issue Dates:

- *All Fields* — Search patches by synopsis, description, topic, or solution.

- *Patch Advisory* — The way SUSE's security team codifies advisories, such as:

  ```
  SUSE-RU-2011:0030
  ```

  Searches can be done by year (such as 2011), by type of advisory, or full advisory name, such as the example above.

- *Package Name* — Users concerned with particular packages can search by package name, such as:

  ```
  kernel
  ```

  Package search can be beneficial because search results will be grouped by advisory. For example, searching for kernel-related bugs return results where all packages with the term `kernel` appear grouped by the advisory for which the bug is related.

- *CVE Name* — The name assigned to the security advisory (RHSA) by the common vulnerabilities and exposures project at http://cve.mitre.org. For example:

  ```
  CVE-2006-4535
  ```

You may also filter patch search results by the type of patch issued. Check or uncheck the boxes next to the type of advisory to search.

- Bug Fix Advisory — Patches that contain fixes to issues that were reported by users or discovered during development or testing.

- Security Advisory — Patches that fix a security issue found during development, testing, or reported by users or a software security clearing house. A security advisory usually has one or more CVE names associated with each vulnerability found in each patch.

- Product Enhancement Advisory — Patches that contain new features, improved functionality, or enhanced performance in the packaged software.

3.6 Channels

If you click the *Channels* tab on the top navigation bar, the *Channels* category and links appear. The pages in the *Channels* category enable you to view and manage the channels and packages associated with your systems.

3.6.1 Software Channels

The *Software Channels* page is the first to appear in the *Channels* category. A software channel is a list of packages grouped by use. Channels are used to choose packages to be installed on a system.

There are two types of software channels: *base channels* and *child channels*.

Base Channels

A base channel consists of a list of packages based on a specific architecture and release. For example, all of the packages in SUSE Linux Enterprise Server 11 for the x86 architecture make up a base channel. The list of packages in SUSE Linux Enterprise Server 11 for the i586 architecture make up a different base channel.

A system must be subscribed to one base channel only. This base channel is assigned automatically during registration based upon the SUSE Linux Enterprise release and system architecture selected. In the case of public free channels, the action always succeeds. In the case of paid base channels, this action fails if an associated entitlement does not exist.

Child Channels

A child channel is a channel associated with a base channel that contains extra packages. For instance, an organization can create a child channel associated with SUSE Linux Enterprise Server for the x86 architecture that contains extra packages needed only for the organization, such as a custom engineering application.

A system can be subscribed to multiple child channels of its base channel. Only packages included in a system's subscribed channels can be installed or updated on that system.

NOTE

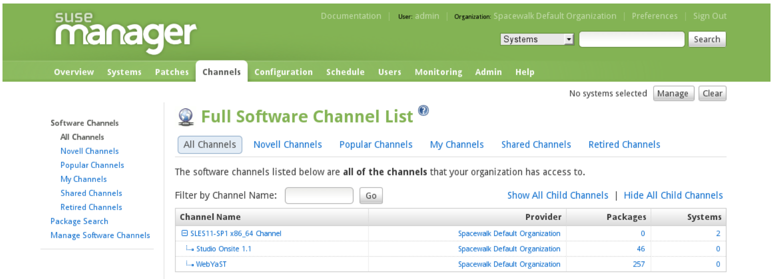
Ensure that you do not create child channels available to client systems that contain packages that are not compatible with the system.

Channels can be further broken down by their relevance to your systems, including *All Channels*, *Novell Channels*, *Popular Channels*, *My Channels*, *Shared Channels*, and *Retired Channels*.

All Channels

As shown in Figure 3.16, “All Channels” (page 128), the *All Channels* page is shown by default when you click Software Channels in the navigation bar. It displays a list of all channels available to your organization. Links within this list go to different tabs of the *Software Channel Details* page. Clicking on a channel name takes you to the *Details* tab. Clicking on the number of packages takes you to the *Packages* tab. Clicking on the number of systems takes you to the *Subscribed Systems* tab. Refer to the section called “Software Channel Details” (page 129) for details.

Figure 3.16 *All Channels*


suse manager
Documentation | User: admin | Organization: Spacewalk Default Organization | Preferences | Sign Out
Systems
Search
Overview Systems Patches Channels Configuration Schedule Users Monitoring Admin Help
No systems selected
Manage
Clear
Software Channels
All Channels
Novell Channels
Popular Channels
My Channels
Shared Channels
Retired Channels
Package Search
Manage Software Channels
All Channels Novell Channels Popular Channels My Channels Shared Channels Retired Channels
Go
Show All Child Channels | Hide All Child Channels

Full Software Channel List

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

Filter by Channel Name:

Channel Name	Provider	Packages	Systems
⊟ SLES11-SP1 x86_64 Channel	Spacewalk Default Organization	0	2
Studio Onsite 1.1	Spacewalk Default Organization	46	0
WebYaST	Spacewalk Default Organization	257	0

Novell Channels

The *Novell Channels* page displays the Novell channels and their available child channels.

WARNING: Novell Channels Cannot Be Deleted

Once imported, Novell channels cannot be deleted. Only custom software channels can be deleted.

Popular Channels

The *Popular Channels* page displays the software channels most subscribed by systems registered to your organization. You can refine the search further by using the drop-down menu to list only the channels with at least a certain number of systems subscribed.

My Channels

The *My Channels* page displays all of the software channels that belong to your organization, which includes both Novell channels and custom channels. You can refine the search further by using the text box to filter by channel name.

Shared Channels

The *Shared Channels* page displays the channels in your organization that you have shared with others in your organizational trust. For more information about organizational trust and channel sharing, refer to Section 5.6.2, “Sharing Content Channels between Organizations in a Trust” (page 196).

Retired Channels

The *Retired Channels* page displays channels available to your organization that have reached their end-of-life dates. These channels do not receive updates.

Software Channel Details

If you click on the name of a channel, the *Software Channel Details* page appears. This page is broken down into the following tabs:

Software Channel Details > Details

General information about the channel and the parent channel, if it is a child channel. This is the first tab displayed when you click on a channel. It displays essential information about the channel, such as summary, description, and architecture.

[Mgmt] — In addition, a globally subscribable checkbox can be seen by SUSE Manager administrators and channel administrators. This signifies the default behavior of every channel allowing any user to subscribe systems to it. Unchecking this box and clicking Update causes the appearance of a *Subscribers* tab, which may then be used to grant certain users subscription permissions to the channel. SUSE Manager administrators and channel administrators can always subscribe systems to any channel.

[Mgmt] — Only customers with custom base channels may change their systems' base channel assignment. They may do this through the website in two ways:

- Customers with a custom base channel may assign the system to that base channel.

- Customers may revert system subscriptions from a custom base channel to the appropriate distribution-based base channel.

NOTE

The system base channel's distribution variant must match the variant installed on the system. For example, a system that has SUSE Linux Enterprise 10 for x86 cannot be registered to a SUSE Linux Enterprise 11 for x86 base channel. Use the file /etc/SuSE-release to check your product, architecture, version, and patchlevel.

Software Channel Details > Patches

List of patches affecting the channel. The list displays advisory types, names, summaries, and the dates issued. Clicking on an advisory name takes you to its *Patch Details* page. Refer to the section called “Patch Details” (page 123) for more information.

Software Channel Details > Packages

List of packages in the channel. To download packages as a .tar file, select them and click the Download Packages button at the bottom-left corner of the page. Clicking on a package name takes you to the *Package Details* page. This page displays a set of tabs with information about the package, including which architectures it runs on, the package size, build date, package dependencies, the change log, list of files in the package, newer versions, and which systems have the package installed. From here, you can download the packages as RPMs or SRPMs.

To search for a specific package or a subset of packages, use the package filter at the top of the list. Enter a substring to search all packages in the list for package names that contain the string. For example, typing **ks** in the filter might return: ksconfig, krb5-workstation, and links. The filter is case-insensitive.

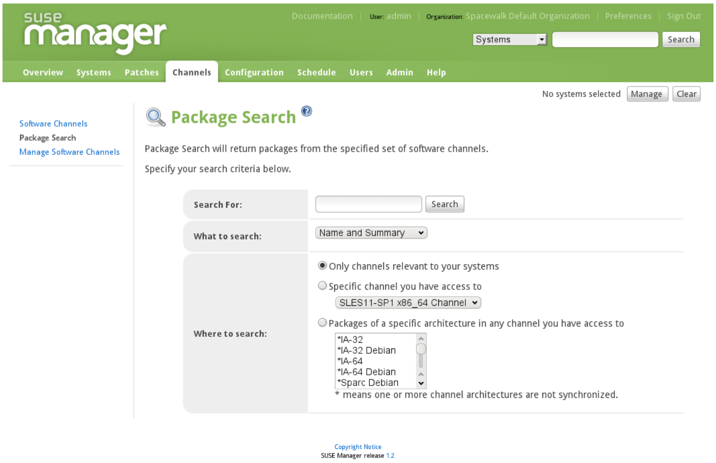
Software Channel Details > Subscribed Systems

List of entitled systems subscribed to the channel. The list displays system names, base channels, and their levels of entitlement. Clicking on a system name takes you to its *System Details* page. Refer to the section called “System Details” (page 61) for more information.

[Mgmt] — If it is a child channel, you also have the option of unsubscribing systems from the channel. Use the checkboxes to select the systems, then click the Unsubscribe button on the bottom right-hand corner.

3.6.2 Package Search

Figure 3.17 *Package Search*



Package Search

Package Search will return packages from the specified set of software channels.

Specify your search criteria below.

Search For:

What to search: Name and Summary

Where to search:

● Only channels relevant to your systems

○ Specific channel you have access to

SLES11-SP1 x86_64 Channel

○ Packages of a specific architecture in any channel you have access to

*IA-32
*IA-32 Debian
*IA-64
*IA-64 Debian
*Sparc Debian

* means one or more channel architectures are not synchronized.

The *Package Search* page allows you to search through packages using various criteria (the *What to search for* label):

- *Free Form* — a general keyword search for users that are unsure of the details of particular package and its contents.

- *Name Only* — Targeted search for users that need to find a specific packages and do not want to sift through more generalized search results.

- *Name and Summary* — Specified searches for a certain package name or program that, while not in the name of the package, may be in the one-line summary of the package.

- *Name and Description* — Similar to a *Name and Summary* search, this search criteria searches package names and the longer Description of the package. So, a search for “web browser” could result in several results that includes both graphical and text-based browsers.

The *Free Form* field addtionally allows you to search using *field names* that you prepend to search queries and filter results by that field keyword.

For example, if you wanted to search all of the SUSE Linux Enterprise packages for the word **`java`** in the description and summary, type the follwing using the *Free Form* field:

```
summary:java  and description:java
```

Other supported field names for documentation search include:

- **`name`** — Search the package names for a particular keyword
- **`version`** — Search for a particular package version
- **`filename`** — Search the package filenames for a particular keyword
- **`description`** — Search the packages' detailed description field for a particular keyword
- **`summary`** — Search the packages' brief summary for a particular keyword
- **`arch`** — Search the packages by their architecture (such as x86, x86_64, or s390)

Along with search criteria, you can also limit searches to *Channels relevant to your systems* by clicking the checkbox. Additionally, you can restrict your search by platform or architecture.

3.6.3 Manage Software Channels

This tab allows administrators to create, clone, and delete custom channels. These channels may contain altered versions of distribution-based channels or custom packages.

Manage Software Channels > Channel Details

The default screen of the *Manage Software Channels* tab is a listing of all available channels. This includes custom, distribution-based, and child channels.

To clone an existing channel, click the *clone channels* link in the upper right of the screen, select the channel to be cloned from the dropdown menu, and click the Create Channel button. The next screen presents various options for the new channel, including base architecture and GPG options. Make your selections and click the Create Channel button to complete the process.

To create a new channel, click the *create new channel* link in the upper right of the screen. Select the various options for the new channel, including base architecture and GPG options. Make your selections and click the Create Channel button. Note that a channel created in this manner is blank, containing no packages. You must either upload software packages or add packages from other channels. You may also choose to include patches in your custom channel.

Manage Software Channels > Channel Details > Details

This screen lists the selections you made during the channel creation process. This page includes the *Globally Subscribable* checkbox that permits all users to subscribe to the channel.

Manage Software Channels > Channel Details > Managers

This subtab allows you to select which users may alter or delete this channel. SUSE Manager administrators and channel administrators may alter or delete any channel.

To allow a user to alter the channel, select the checkbox next to the user's name and click the Update button. To allow all users to manage the channel, click the Select All button at the bottom of the list followed by the Update button. To remove a user's ability to manage the channel, uncheck the box next to their name and click the Update button.

Manage Software Channels > Channel Details > Patches

This subtab allows channel managers to list, remove, clone, and add patches to their custom channel. Custom channels not cloned from a distribution may not add patches until there are packages in the channel. Only patches that match the base architecture of the channel and apply to a package in that channel may be added to the channel. Finally, only cloned or custom patches may be added to custom channels. Patches may be included in a cloned channel if they are selected during channel creation.

Manage Software Channels > Channel Details > Packages

This subtab is similar to the *Patches* subtab. It allows channel and organization administrators to list, remove, compare, and add packages to the custom channel.

To list all packages in the channel, click the *List / Remove Packages* link. Check the box to the left of any package you wish to remove, then click the Remove Packages button in the lower right of the page.

To add packages, click the *Add Packages* link. Choose a channel from which to select packages from the drop-down menu and click the View button to continue. Check the box to the left of any package you wish to add to the channel, then click the Add Packages button in the bottom right of the screen.

To compare packages within the current channel with those of another channel, select the other channel from the drop-down menu and click the Compare button. All packages present in either channel are compared, and the results displayed on the next screen. This information includes the architecture and version of each package.

To make the two channels identical, click the Merge Differences button in the lower right. The following screen allows you to select how conflicts are resolved. Click the Preview Merge button to view the results of the merging without making any changes to the channels. Finally, select those packages that you wish to merge and click the Merge Packages button followed by the Confirm button to perform the merge.

Manage Software Channels > Manage Software Packages

This tab allows you to manage custom software packages owned by your organization. You may view a list of all custom software or view only those packages in a selected custom channel. To select the channel whose custom packages you wish to view, select the channel from the drop-down menu and click the View Packages button.

Manage Software Channels > Manage Repositories

This tab allows you to add and manage existing custom or third-party package repositories as well as link the repositories to an existing channel. The repositories feature currently supports repomd repositories.

To create a new repository click the *create new repository* link at the top right of the *Manage Repositories* page. The *Create Repository* screen prompts you to enter a *Repository Label* (such as **sles-11-x86_64**) as well as a *Repository URL* (such as http://customrepo.example.com). You can also enter URLs pointing to mirror lists as well as direct download URLs. Upon completion, click the Create Repository button.

To link the newly created repository to an existing software channel, click the *Manage Software Channels* link in the left menu, then click the Channel you want to link. From the channel's Detail page, click the *Repositories* subtab, then check the box corresponding to the repository you want to link, and click *Update Repositories*.

To synchronize packages from a custom repository to your channel, click the *Sync* link from the channel's *Repositories* subtab, and confirm by clicking the Sync button.

3.7 Configuration

This tab is the portal to managing your configuration channels and files, whether they are centrally managed or limited to a single system. You must be a Configuration Administrator or a SUSE Manager Administrator to see the *Configuration* tab. In addition, you must have at least one Provisioning entitlement, or the tab does not appear.

Central and local configuration management are discussed in this chapter. Centrally-managed files are available to multiple systems; changes to a single file in a central configuration channel can affect many systems. Each system with a Provisioning entitlement also has a local configuration channel (also referred to as an override channel) and a sandbox channel.

3.7.1 Preparing Systems for Config Management

For a system to have its configuration managed through SUSE Manager, it must have the appropriate tools and the `config-enable` file installed. These tools may already be installed on your system, especially if you installed the system with configuration management functionality using AutoYaST or Kickstart. If not, they can be found within the Tools child channel for your distribution. Download and install the latest `rhncfg*` packages. They are:

- `rhncfg` — The base libraries and functions needed by all `rhncfg-*` packages.

- `rhncfg-actions` — The RPM package required to run configuration actions scheduled via SUSE Manager.

- `rhncfg-client` — A command line interface to the client features of the Configuration Management system.

- `rhncfg-management` — A command line interface used to manage SUSE Manager configuration.

Next, you must enable your system to schedule configuration actions. This is done using the `mgr-actions-control` command on the client system. This command is included in the `rhncfg-actions` RPM. The Actions Control (`mgr-actions-control`) enables or disables specific modes of allowable actions. Refer to Section A.1, "Actions Control" (page 213) for instructions.

3.7.2 Overview

The *Configuration Overview* page allows you to assess at a glance the status of your configuration files and the systems that use them.

Configuration Summary
: This panel provides quick reference information about your configuration files. Clicking on any of the blue texts to the right displays an appropriate list of either relevant systems, channel details, or configuration files.

Configuration Actions
: This panel offers direct access to the most common configuration management tasks. You can view or create files or channels, or enable configuration management on your systems.

Recently Modified Configuration Files
: The list displayed here indicates which files have changed, to which channel they belong, and when they were changed. If no files have been recently changed, no list appears. Click on the name of the file to be taken to that file's *Details* page. Click on the channel name to be taken to the *Channel Details* page for that channel.

Recently Scheduled Configuration Deployments
: Each action that has been scheduled is listed here along with the status of the action. Any configuration task that is scheduled, from enabling configuration management on a system to deploying a specific configuration file, is displayed here. This allows you to quickly assess if your tasks have succeeded, and to take action to correct

any issues. Clicking on any blue text displays the *System Details* > *Schedule* page for the specified system.

3.7.3 Configuration Channels

As mentioned above, SUSE Manager manages both central and local configuration channels and files. Central configuration management allows you to deploy configuration files to multiple systems. Local configuration management allows you to specify overrides, or configuration files that are not changed by subscribing the system to a central channel.

Central configuration channels must be created via the link on this page. Local configuration channels are not created here; they automatically exist for each system to which a Provisioning entitlement has been applied.

Click on the name of the configuration channel to be taken to the details page for that channel. If you click on the number of files in the channel, you are taken to the *List/Remove Files* page of that channel. If you click on the number of systems subscribed to the configuration channel, you are taken to the *Systems* > *Subscribed Systems* page for that channel.

To create a new central configuration channel:

1. Click the *create new config channel* link in the upper right of this screen.

2. Enter a name for the channel.

3. Enter a label for the channel. This field must contain only alphanumeric characters, "-", "_", and "."

4. Enter a description for the channel. You must enter a description, though there is no character restriction. This field can contain any brief information that allows you to distinguish this channel from others.

5. Press the Create Config Channel button to create the new channel.

6. The following page is a subset of the *Channel Details* page, and has three subtabs: *Overview*, *Add Files*, and *Systems*. The *Channel Details* page is discussed fully in the section called “*Configuration* > *Configuration Channels* > *Configuration Channel Details*” (page 138).

Configuration > Configuration Channels > Configuration Channel Details

Overview

This subtab is very similar to the *Configuration Overview* page. The *Channel Information* panel provides status information for the contents of the channel. The *Configuration Actions* panel provides access to the most common configuration tasks. The main difference is the *Channel Properties* panel. By clicking on the *Edit Properties* link, you can edit the name, label, and description of the channel.

List/Remove Files

This tab, which only appears if there are files in the configuration channel, lists the files that this configuration channel contains. You can remove a file or files, or copy the latest version into a set of local overrides or into other central configuration channels. Check the box next to any files you wish to manipulate and click the button corresponding to the desired action at the bottom of the screen.

Add Files

The *Add Files* subtab has three subtabs of its own, which allow you to *Upload*, *Import*, or *Create* configuration files to be included in the channel.

Upload File

To upload a file into the configuration channel, browse for the file on your local system, populate all fields, and click the Upload Configuration File button. The *Filename/Path* field is the absolute path where the file will be deployed.

You can also indicate the *Ownership* (the *user name* and *group name*) as well as the *Permissions* of the file when it is deployed.

If the client has SELinux enabled, you can configure *SELinux contexts* to enable the required file attributes (such as user, role, and file type) that allow it to be used on the system.

Finally, if the configuration file includes a macro, enter the symbol that marks the beginning and end of the macro.

Import Files

From this page you can import files from other configuration channels, including any locally-managed channels. Check the box to the left of any file you wish to import and press the Import Configuration File(s) button.

NOTE

A sandbox icon indicates that the listed file is currently located in a local sandbox channel. Files in a system's sandbox channel are considered experimental and could be unstable. Use caution when selecting them for a central configuration channel.

Create File

From this page you can create a configuration file, directory, or symbolic link from scratch to be included in the configuration channel.

First, choose whether you want to create a text file, directory, or symbolic link (symlink) in the *File Type* section. Indicate the absolute path along which the file should be deployed in the `Filename/Path` text box. If you are creating a symlink, indicate the target file and path in the *Symbolic Link Target Filename/Path* text box.

Enter the *User name* and *Group name* for the file in the *Ownership* section, as well as the *File Permissions Mode* for the file.

If the client has SELinux enabled, you can configure *SELinux contexts* to enable the required file attributes (such as user, role, and file type) that allow it to be used on the system.

If the configuration file includes a macro, enter the symbol that marks the beginning and end of the macro. Then, enter the configuration file content in the *File Contents* field, using the script dropdown menu to choose the appropriate scripting language. Finally, press the Create Configuration File button to create the new file.

Deploy Files

This subtab only appears when there are files present in the channel. You can deploy all files by pressing the Deploy All Files button, or you can check selected files and press the Deploy Selected Files button. You will then be asked to select to which systems the file(s) should be applied. The listed systems are those that are subscribed to this channel. If you wish to apply the file to a system not listed here, first subscribe that system to the channel. When ready, press the Confirm and Deploy to Selected Systems button to deploy the files.

Systems

This tab, which consists of two subtabs, allows you to manage the systems that are subscribed to the configuration channel.

Subscribed Systems

This subtab displays a list of all systems that are subscribed to the current channel. Clicking on the name of the system takes you to the *System Details* page for that system.

Target Systems

This subtab displays a list of systems that have been enabled for configuration management and that are not yet subscribed to the channel. To add a system to the configuration channel, check the box to the left of the system's name and press the Subscribe System button.

3.7.4 Configuration Files

This tab allows you to manage your configuration files independently. Both centrally-managed and locally-managed files can be reached from subtabs.

NOTE

By default, the maximum file size for configuration files is 128KB. If you need to change that value, find and modify the following line in the `/etc/rhn/default/rhn_web.conf` file:

```
web.maximum_config_file_size=128
```

You must also find and change the following line in the `/etc/rhn/default/rhn_server.conf` file to the same value:

```
maximum_config_file_size=131072
```

Change the value in both files from **`131072`** to the desired value in bytes.

Centrally-Managed Files

Centrally-managed files are those that are available to multiple systems. Changing a file within a centrally-managed channel may result in changes to several systems.

This page lists all files that are currently stored in your central configuration channels. Click on the *Path* of a file to be taken to the *Configuration File Details* page for that file. Select the name of the configuration channel to be taken to the *Channel Details* page of the channel that contains the file. Clicking on the number of systems takes you to a listing of systems currently subscribed to the channel containing that file. Finally, clicking on the number of overriding systems displays a list of systems that have a local (or override) version of the configuration files (which means that the centrally-managed file will not be deployed to those systems).

3.7.5 Locally-Managed Files

Locally-managed configuration files are those files that apply to only one system. They may be files in the system's sandbox or they may be files that can be deployed to the system at any time. Local files have higher priority than centrally-managed files - that is, if a system is subscribed to a configuration channel with a given file, and also has a locally-managed version of that same file, the locally-managed version is the one that will be deployed.

This page lists all of the local (override) configuration files for your systems. This includes the local configuration channels and the sandbox channel for each Provisioning-entitled system.

Click the *Path* of the file to go to the *Config File Details* page for the file. Click the name of the system to which it belongs to go to the *System Details* > *Configuration* > *Configuration* > *Overview* page for the system.

Including Macros in your Configuration Files

Being able to store and share identical configurations is useful, but what if you have many variations of the same configuration file? What do you do if you have configuration files that differ only in system-specific details, such as hostname and MAC address?

In traditional file management, you would be required to upload and distribute each file separately, even if the distinction is nominal and the number of variations is in the hundreds or thousands. SUSE Manager addresses this by allowing the inclusion of macros, or variables, within the configuration files it manages for Provisioning-entitled systems. In addition to variables for custom system information, the following standard macros are supported:

- rhn.system.sid
- rhn.system.profile_name
- rhn.system.description
- rhn.system.hostname
- rhn.system.ip_address
- rhn.system.custom_info(key_name)
- rhn.system.net_interface.ip_address(eth_device)
- rhn.system.net_interface.netmask(eth_device)
- rhn.system.net_interface.broadcast(eth_device)
- rhn.system.net_interface.hardware_address(eth_device)
- rhn.system.net_interface.driver_module(eth_device)

To use this powerful feature, either upload or create a configuration file through the *Configuration Channel Details* page. Then, open its *Configuration File Details* page and include the supported macros of your choosing. Ensure that the delimiters used to offset your variables match those set in the *Macro Start Delimiter* and *Macro End Delimiter* fields and do not conflict with other characters in the file. We recommend that the delimiters be two characters in length and must not contain the percent (%) symbol.

As an example, you may have a file applicable to all of your servers that differs only in IP address and hostname. Rather than manage a separate configuration file for each server, you may create a single file, such as `server.conf`, with the IP address and hostname macros included, like so:

```
hostname={| rhn.system.hostname |}
ip_address={| rhn.system.net_interface.ip_address(eth0) |}
```

Upon delivery of the file to individual systems, whether through a scheduled action in the SUSE Manager website or at the command line with the SUSE Manager Configuration Client (`mgrcfg-client`), the variables will be replaced with the hostname and IP address of the system, as recorded in SUSE Manager's System Profile. In the above configuration file, for example, the deployed version resembles the following:

```
hostname=test.example.domain.com
ip_address=177.18.54.7
```

To capture custom system information, insert the key label into the custom information macro (rhn.system.custom_info). For instance, if you developed a key labeled "asset" you can add it to the custom information macro in a configuration file to have the value substituted on any system containing it. The macro would look like this:

```
asset={@ rhn.system.custom_info(asset) @}
```

Upon deployment of the file to a system containing a value for that key, the macro gets translated, resulting in a string similar to the following:

```
asset=Example#456
```

To include a default value, for instance if one is required to prevent errors, you can append it to the custom information macro, like so:

```
asset={@ rhn.system.custom_info(asset) = 'Asset #' @}
```

This default is overridden by the value on any system containing it.

Using the SUSE Manager Configuration Manager (`mgrcfg-manager`) will not translate or alter files, as that tool is system agnostic— `mgrcfg-manager` does not depend on system settings. Binary files cannot be interpolated.

3.7.6 Systems

This page displays status information about your system in relation to configuration. There are two subtabs: *Managed Systems* and *Target Systems*.

Managed Systems

This page is the default display for the *Configuration* > *Systems* page. The systems displayed here have been fully prepared for configuration file deployment. The number of local and centrally-managed files is displayed. Clicking the name of the system takes you to the *System Details* > *Configuration* > *Overview* page for the system. Clicking on the number of local files takes you to the *System Details* > *Configuration* > *View/Modify Files* > *Locally-Managed Files* page, which allows you to manage which local (override) files apply to the system. Clicking on the number of centrally-managed files takes you to the *System Details* > *Configuration* > *Manage Configuration Channels*

> *List/Unsubscribe from Channels* page. This allows you to unsubscribe from any channels you wish.

Target Systems

This page displays the systems that are either not prepared for configuration file deployment or have not yet been subscribed to a configuration channel. The table has three columns which identify the system name, whether they are prepared for configuration file deployment, and a list of the steps that have yet to be completed before the system is prepared. By selecting the check box to the left of the profile name and then pressing the Enable SUSE Manager Configuration Management button, all of the preparatory steps that can be automatically performed are scheduled by SUSE Manager.

NOTE

You will have to perform a few manual steps to enable configuration file deployment, follow the on-screen instructions that are provided to assist with this step.

3.8 Schedule

If you click the *Schedule* tab on the top navigation bar, the *Schedule* category and links appear. These pages enable you to track the actions taking place within your systems. An action is a scheduled task that is to be performed on one or more client systems. For example, an action can be scheduled to apply all patches to a system.

SUSE Manager keeps track of the following action types:

1. Package alteration (installation, upgrade, and removal)

2. Rollback package actions

3. System reboots

4. Patches

5. Configuration file alteration (deploy, upload, and diff)

6. Hardware profile updates

7. Package list profile uipdates

8. Kickstart Initiation

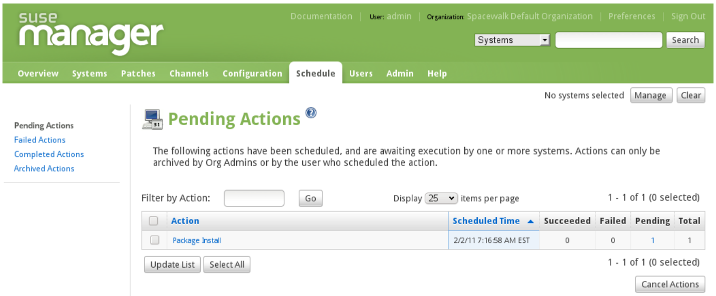
9. Remote Commands

Each page in the *Schedule* category represents an action status.

3.8.1 Pending Actions

As shown in Figure 3.18, “Schedule - Pending Actions” (page 145), the *Pending Actions* page is shown by default when you click *Schedule* in the top navigation bar. It displays actions that have not started or are in progress.

Figure 3.18 *Schedule - Pending Actions*



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.

Filter by Action: Display 25 items per page 1 - 1 of 1 (0 selected)

□	Action	Scheduled Time ▲	Succeeded	Failed	Pending	Total
□	Package Install	2/2/11 7:16:58 AM EST	0	0	1	1

1 - 1 of 1 (0 selected)

3.8.2 Failed Actions

Actions that could not be completed. If the action returns an error, it is displayed here.

3.8.3 Completed Actions

Actions that have succeeded.

3.8.4 Archived Actions

Actions that you have selected to store for review.

3.9 Users — [Mgmt]

Only SUSE Manager administrators can see the *Users* tab on the top navigation bar. If you click the *Users* tab, the *Users* category and links appear. These pages enable you to grant and edit permissions for those who administer your system groups. Click in the *User List* to modify users within your organization.

To add new users to your organization, click the *create new user* link on the to right corner of the page. The next page is the *Create User* page. Carefully fill in each of the required values for the new user.

Once all fields are complete, select the Create Login button. SUSE Manager now sends an email to the specified address and redirects you to the *Users* > *User List* page. If you wish to select permissions and options for the newly created user, select their name from the list. Doing so displays the *User Details* page for that user, which provides several subtabs of options from which to choose. Refer to the section called "*User List* > *Active* > *User Details* — [Mgmt]" (page 147) for detailed descriptions of each subtab.

3.9.1 *User List > Active* — [Mgmt]

This tab lists all active users of your SUSE Manager account. It displays the following basic information about each user: their username, real name, roles, and the date of their last sign in.

As shown in Figure 3.19, "User List" (page 147), each row in the *User List* represents a user within your organization. There are four columns of information for each user:

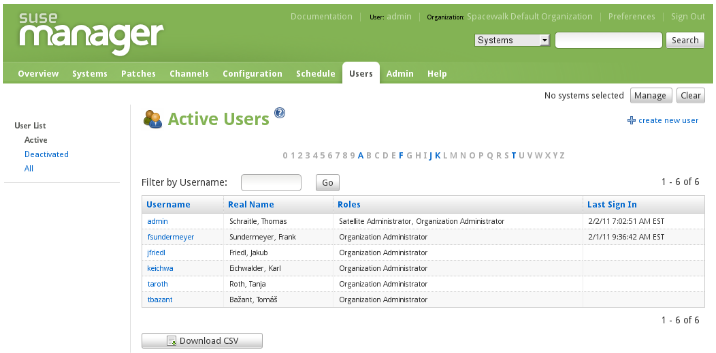
- *Username* — The login name of the user. If you click on a username, the *User Details* page for the user is displayed. Refer to the section called "*User List* > *Active* > *User Details* — [Mgmt]" (page 147) for more information.

- *Real Name* — The full name of the user (last name first).

- *Roles* — List of the user's privileges, such as organization administrator, Channel administrator and normal user. Users can have multiple roles.

- *Last Sign In* — Shows when the user last logged into SUSE Manager.

Figure 3.19 *User List*



Username	Real Name	Roles	Last Sign In
admin	Schraitle, Thomas	Satellite Administrator, Organization Administrator	2/2/11 7:02:51 AM EST
fsundermeyer	Sundermeyer, Frank	Organization Administrator	2/1/11 9:36:42 AM EST
jfriedl	Friedl, Jakub	Organization Administrator	
keichwa	Eichwalder, Karl	Organization Administrator	
taroth	Roth, Tanja	Organization Administrator	
tbazant	Bažant, Tomáš	Organization Administrator	

User List > Active > User Details — [Mgmt]

The *User Details* page allows SUSE Manager administrators to manage the permissions and activity of all users. Included in the *User Details* page is the ability to delete or deactivate users.

Users may now be deactivated directly from the SUSE Manager Web interface. SUSE Manager customers may deactivate or delete users from their systems, although non-SUSE Manager customers must contact Customer Service to delete a user. Users may be deactivated or deleted by SUSE Manager administrators, or users may deactivate their own accounts.

Deactivated users cannot log in to the SUSE Manager web interface, nor may they schedule any actions. SUSE Manager administrators may not be deactivated until that role is removed from their account. Actions scheduled by a user prior to their deactivation remain in the action queue. For added flexibility, deactivated users may be reactivated by SUSE Manager administrators.

User deletion from the Web interface is available exclusively to SUSE Manager customers. The SUSE Manager administrator role must be removed from a user before that individual may be deleted.

WARNING: Irreversible Deletion

User deletion is irreversible; exercise it with caution. Consider disabling the user first in order to assess the effect deletion will have on your infrastructure.

To deactivate a user:

1. Navigate to the user's *User Details* tab.

2. Verify that the user is not an SUSE Manager administrator. If they are, uncheck the box to the left of that role and click the Submit button in the lower right of the screen.

3. Click the *deactivate user* link in the upper right of the screen.

4. Click the Deactivate User button in the lower right to confirm.

To delete a user:

1. Navigate to the user's *User Details* tab.

2. Verify that the user is not an SUSE Manager administrator and remove that role if necessary.

3. Click the *delete user* link in the upper right.

4. Click the Delete User button to permanently delete the user.

For instructions regarding deactivating your own account, refer to the section called “Account Deactivation” (page 54).

User List > Active > User Details > Details — [Mgmt]

This is the default *User Details* tab, which displays the username, first name, last name, email address, and user roles for the user. All of this information is modifiable. To do so, make your changes and click the Update button. Remember, when changing a user's password, you will see only asterisks as you type the password.

To delegate responsibilities within your organization, SUSE Manager provides several roles with varying degrees of responsibility and access. This list describes the permissions of each and the differences between them:

- *User* — Also known as a *System Group User*, this is the standard role associated with any newly created user. This person may be granted access to manage system groups and software channels. The systems must be in system groups to which the user has permissions for them to be manageable or even visible. Remember, however, all globally subscribable channels may be used by anyone.

- *Activation Key Administrator* — This role is designed to manage your organization's collection of activation keys. This person can create, modify, and delete any key within your overarching account.

- *Channel Administrator* — This role has complete access to the software channels and related associations within your organization. It requires SUSE Manager synchronization tool (`mgr-ncc-sync`). This person may change the base channels of systems, make channels globally subscribable, and create entirely new channels.

- *Organization Administrator* — This role enables the user to get all the permissions of the activation key, configuration, monitoring, channel, and system group administrator.

- *Configuration Administrator* — This role enables the user to manage the configuration of systems in the organization using either the SUSE Manager Web-based interface or the Red Hat Network Configuration Manager.

- *Monitoring Administrator* — This role allows for the scheduling of probes and oversight of other Monitoring infrastructure. This role is available only on Monitoring-enabled SUSE Manager. Activate Monitoring in *Admin* > *SUSE Manager Configuration* > *General* and click on *Enable Monitoring*.

- *SUSE Manager Administrator* — This role can perform any function available within SUSE Manager. As the master account for your organization, the person holding this role can alter the privileges of all other accounts, as well as conduct any of the tasks available to the other roles. Like the other roles, multiple SUSE Manager administrators may exist. Go to *Admin* > *Users* and click the check box in the *SUSE Manager Admin?* row.

- *System Group Administrator* — This role is one step below SUSE Manager administrator in that it has complete authority over the systems and system groups to which it is granted access. This person can create new system groups, delete any assigned systems groups, add systems to groups, and manage user access to groups.

Being a SUSE Manager administrator enables you to remove administrator rights from other users. It is possible to remove your own privileges as long as you are not the last SUSE Manager administrator.

To assign a user a new role, select the appropriate checkbox. Remember that SUSE Manager administrators are automatically granted administration access to all other roles, signified by grayed-out checkboxes. To grant a user the ability to manage the configuration of systems, select the *Configuration Administrator* checkbox. When satisfied with the changes, click Update.

User List > Active > User Details > System Groups — [Mgmt]

This tab displays a list of system groups that the user may administer. SUSE Manager administrators may use the check boxes to set this user's access permissions to each system group. Check or uncheck the box to the left of the system group and click the Update Permissions button to save the changes.

SUSE Manager administrators may select one or more default system groups for this user. When the user registers a system, that system is assigned to the selected group or groups. This allows the user to have access to the newly-registered system immediately, if he or she has permissions to one or more of the groups to which the system is assigned. System groups to which this user has access are preceded by an (*).

User List > Active > User Details > Systems — [Mgmt]

This tab lists all systems to which the user has access permission. These systems come from the system groups assigned to the user on the previous tab. You may choose a set of systems to work with by checking the boxes to the left of the systems and clicking the Update List button. Use the System Set Manager page to execute actions on those systems. Clicking the name of a system takes you to its *System Details* page. Refer to the section called “System Details” (page 61) for more information.

User List > Active > User Details > Channel Permissions — [Mgmt]

This tab lists all channels available to your organization. You may grant explicit channel subscription permission to this user for each of the channels listed by checking the box to the left of the channel and clicking the Update Permissions button. Permissions granted through SUSE Manager administrator status, channel administrator status, or because the channel is globally subscribable have no checkbox, but display a check icon instead.

User List > Active > User Details > Channel Permissions > Subscription — [Mgmt]

Identifies channels to which the user may subscribe systems. To change these, select or unselect the appropriate checkboxes and click the Update Permissions button. Note that channels subscribable through the user's admin status or the channel's global setting cannot be altered. They are identified with a check icon.

User List > Active > User Details > Channel Permissions > Management — [Mgmt]

Identifies channels the user may manage. To change these, select or unselect the appropriate checkboxes and click the Update Permissions button. This status does not enable the user to create new channels. Note that channels automatically manageable through the user's admin status cannot be altered. They are identified with a check icon. Remember, SUSE Manager administrators and channel administrators can subscribe to or manage any channel.

User List > Active > User Details > Preferences — [Mgmt]

This page allows you to configure whether the user receives email notifications, the number of entries displayed per list page, and the timezone of the user. Make selections and click the Save Preferences button to update.

- Email Notification — Determine whether this user should receive email every time an patch alert is applicable to one or more systems in his or her SUSE Manager account, as well as daily summaries of system events.

- SUSE Manager List Page Size — Maximum number of items that appear in a list on a single page. If more items are in the list, clicking the *Next* button displays the next group of items. This preference applies to the user's view of system lists, Errata lists, package lists, and so on.

- “Overview” Start Page — Displays information regarding on the “Overview” page upon login.

To modify any of these options, make your changes and click the Save Preferences button.

User List > Active > User Details > Addresses — [Mgmt]

This tab lists the addresses associated with the user's account. To update this information, click the appropriate *Edit this address* link, enter the relevant information, and click the Update button.

User List > Active > User Details > Notification Methods — [Mon]

This tab lists email and pager addresses designated to receive alerts from monitoring probes. To create a method, click *create new method* and complete the fields. If you will receive these alerts via pager, select the associated checkbox to have the messages sent in a shorter format. When finished, click Create Method. The method shows up in the methods list, from which it can be edited and deleted.

You may delete notification methods here, as well. If the notification method has probes attached to it, you are presented with a list of the probes. Note that if you are a monitoring administrator and cannot manage the system in question, the *System Details* and probe's *Current State* page are not accessible via links in their names. As always, SUSE Manager administrators have full access to all aspects of your SUSE Manager account.

3.9.2 *User List > Deactivated* — [Mgmt]

This page lists all users who have been deactivated. To reactivate any of the users listed here, click the check box to the left of their name and click the Reactivate button followed by the Confirm button. Reactivated users retain the permissions and system group associations they had when they were deactivated. Clicking on the User Name of any individual takes you to their User Details page.

3.9.3 *User List > All* — [Mgmt]

The *All* page lists all users that belong to your organization. In addition to the fields listed in the previous two screens, the table of users includes a *Status* field. This field indicates whether the user is *Active* or *Deactivated*. Deactivated users are also grayed out to indicate their status. Click on the username to move to the user's *User Details* page.

3.10 Monitoring — [Mon]

If you click the *Monitoring* tab on the top navigation bar, the *Monitoring* category and links appear. If you do not see the tab, activate monitoring in *Admin* > *SUSE Manager Configuration* > *General* and click the *Enable Monitoring* checkbox.

These monitoring pages enable you to view the results of probes you have set to run against monitoring-entitled systems and manage the configuration of your monitoring infrastructure.

Initiate monitoring of a system through the *Probes* tab of the *System Details* page. Refer to the section called “System Details” (page 61) for a description of the tab. See Appendix C, *Probes* (page 235) for the complete list of available probes.

3.10.1 *Status* — [Mon]

The *Probe Status List* page is shown by default when you click *Monitoring* in the top navigation bar.

The *Probe Status List* page displays the summary count of probes in the various states and provides a simple interface to find problematic probes quickly. Please note that the probe totals in the tabs at the top of the page may not match the numbers of probes displayed in the tables below. The counts at the top include probes for all systems in your organization, while the tables display probes on only those systems to which you have access through the system group administrator role. Also, the probe counts displayed here may be out of sync by as much as one minute.

The following list describes each state and identifies the icons associated with them:

- ❗ — *Critical* - The probe has crossed a CRITICAL threshold.

- ⚠ — *Warning* - The probe has crossed a WARNING threshold.

- ❓ — *Unknown* - The probe is not able to accurately report metric or state data.

- 🕒 — *Pending* - The probe has been scheduled but has not yet run or is unable to run.

- ☑ — *OK* - The probe is running successfully.

The *Probe Status List* page contains tabs for each of the possible states, as well as one that lists all probes. Each table contains columns indicating probe state, the monitored system, the probes used, and the date and time the status was last updated.

In these tables, clicking the name of the system takes you to the *Probes* tab of the *System Details* page. Clicking the name of the probe takes you to its *Current State* page. From there, you may edit the probe, delete it, and generate reports based upon its results.

Monitoring data and probe status information that was previously availble only through the web interface of SUSE Manager can now be exported as a CSV file. Click on the *Download CSV* links throughout the Monitoring pages to download CSV files of relevent information. The exported data may include, but is not limited to:

- Probe status
- All probes in a given state (OK, WARN, UNKNOWN, CRITICAL, PENDING)
- A probe event history

Probe Status > Critical — [Mon]

The probes that have crossed their CRITICAL thresholds or reached a critical status by some other means. For instance, some probes become critical (rather than unknown) when exceeding their timeout period.

Probe Status > Warning — [Mon]

The probes that have crossed their WARNING thresholds.

Probe Status > Unknown — [Mon]

The probes that cannot collect the metrics needed to determine probe state. Most but not all probes enter an unknown state when exceeding their timeout period. This may mean that the timeout period should be increased, or the connection cannot be established to the monitored system.

It is also possible the probes' configuration parameters are not correct and their data cannot be found. Finally, this state may indicate that a software error has occurred.

Probe Status > Pending — [Mon]

The probes whose data have not been received by SUSE Manager. This state is expected for a probe that has just been scheduled but has not yet run. If all probes go into a pending state, your monitoring infrastructure may be failing.

Probe Status > OK — [Mon]

The probes that have run successfully without exception. This is the state desired for all probes.

Probe Status > All — [Mon]

All probes scheduled on systems in your account, listed in alphabetical order by the name of system.

Current State — [Mon]

Identifies the selected probe's status and when it last ran, while providing the ability to generate a report on the probe. Although this page is integral to monitoring, it is found under the *Probes* tab within the *System Details* page since its configuration is specific to the system being monitored.

To view a report of the probe's results, choose a relevant duration using the *date* fields and decide whether you would like to see metric data, the state change history or both. To obtain metric data, select the metric(s) on which you wish to see a report, and decide (using the checkboxes) whether the results should be shown in a graph, an event log, or both. Then click the Generate report button at the bottom of the page. If no data exist for the probe's metrics, you are presented with the following message:

```
NO DATA SELECTED TIME PERIOD AND METRIC
```

3.10.2 Scout Config Push — [Mon]

Displays the status of your monitoring infrastructure. Anytime you make a change to your monitoring configuration, such as adding a probe to a system or editing a probe's thresholds, you must reconfigure your monitoring infrastructure. Do this by selecting the SUSE Manager Server's checkbox and clicking Push Scout Configs. The table on this page identifies the date and time of requested and completed pushes.

Clicking the name of the server opens its SUSE Manager monitoring daemon SSH public key. This allows you to copy and paste the SSH key to the systems that are monitored by the scout. This is required in order for the SUSE Manager network monitoring daemon to connect to SUSE Manager.

3.10.3 *Notification* — [Mon]

Identifies the contact methods that have been established for your organization. These methods contain email or pager addresses designated to receive alerts from probes.

The various notification methods available to your organization are listed here on the default *Notification* screen. The methods are listed according to the user to which they apply.

To create a new notification method, click on the name of the user to whom the notification will apply. The user's *User Details* > *Notification Methods* page appears. Refer to the section called "*User List* > *Active* > *User Details* > *Notification Methods* — [Mon]" (page 152) for further information. Click on the title of the notification method to edit the properties of the method.

Notification > Filters

Notification filters allow you to create long-term rules that suspend, redirect, or automatically acknowledge standard notifications or send supplemental notifications. This can be helpful in managing verbose or frequent probe communication.

Notification > Notification Filters > Active Filters

This is the default screen for the *Notification Filters* tab. It lists all active filters available for your organization. Click the name of the filter to edit the properties of the filter.

To create a notification filter, click the *create new notification filter* link in the upper right of the screen. Configure each option listed below and click the Save Filter button to create the filter.

1. *Description*: Enter a value that allows you to distinguish this filter from others.

2. *Type*: Determine what action the filter should take: redirect, acknowledge, suspend, or supplement the incoming notification.

3. *Send to*: The *Redirect Notification* and *Supplemental Notification* options in step two require an email address to which to send the notifications. The remaining options require no email address.

4. *Scope*: Determine which monitoring components are subject to the filter.

5. *Organization/Scout/Probe*: This option allows you to select the organization, scout(s), or probe(s) to which this filter applies. To select multiple items from the list, hold the Ctrl key while clicking the names of the items. To select a range of items, hold the Shift key while clicking on the first and last items in the range.

6. *Probes in State*: Select which probe state(s) relate to the filter. For example, you may choose to create a supplemental notification for critical probes only. Un-check the box to the left of any state you want the filter to ignore.

7. *Notifications sent to*: This is the method to which the notification would be sent if no filter were in place. You may, for example, redirect notifications that would normally go to a user should that individual go on vacation, leaving all other notifications from the probe unchanged.

8. *Match Output*: Select precise notification results by entering a regular expression here. If the "Message:" portion of the notification does not match the regular expression, the filter is not applied.

9. *Recurring*: Select whether a filter runs continuously or on a recurring basis. A recurring filter runs multiple times for a period of time smaller than the duration of the filter. For example, a recurring filter could run for 10 minutes of every hour between the start and end times of the filter. A non-recurring filter runs continuously between the start and end times of the filter.

10. *Beginning*: Enter a date and time for the filter to begin operation.

11. *Ending*: Enter an end date and time for the filter.

12. *Recurring Duration*: How long a recurring filter instance is active. This field, applicable to recurring filters only, begins at the *Beginning* time specified above. Any notification generated outside of the specified duration is not filtered.

13. *Recurring Frequency*: How often the filter activates.

Notification filters cannot be deleted. However, a filter may be canceled by setting the end date to some time in the past. (Note that the end date must be equal to or later than the start date, or the change fails.) Another method is to select a set of filters from the *Active* page and click the Expire Notification Filters button in the lower right. These filters are then canceled and appears in the *Expired Filters* tab.

Notification > Notification Filters > Expired Filters

This tab lists all notification filters whose end date has passed. Expired filters are stored indefinitely; this allows an organization to recycle useful filters as needed and provides a historical record for troubleshooting.

3.10.4 Probe Suites — [Mon]

Probe Suites allow you to configure and apply one or more probes to a system or systems. Probe Suites may be configured once and then applied to any number of systems in a batch. This results in time savings and consistency for Monitoring customers.

To create and apply a probe suite, first create an empty probe suite, then configure member probes, and finally apply the suite to selected systems. Proceed as follows:

1. From the *Monitoring* > *Probe Suites* page, select the *create probe suite* link. Enter an easily distinguishable name for the probe suite. You may also choose to add a brief description of the suite. Click the Create Probe Suite button to continue.

2. Add and configure the probes that comprise the suite. Click the *create new probe* link in the upper right.

3. As described in the section called “*System Details* > *Monitoring* — [Mon]” (page 78), configure the probe and click the Create Probe button in the lower right. Repeat this process until all desired probes have been added.

NOTE

Your mail transfer agent must be configured correctly on your SUSE Manager server and each client system to which the probe suite is applied must have the `rhnmd` daemon installed and running. Refer to the Installation Guide (↑Installation Guide) for additional information.

4 Add the systems to which the probe suite applies. Click the *add systems to probe suite* link in the upper right of the screen to continue.

5 The next page displays a list of all systems with monitoring entitlements. Check the box to the left of the system(s) to which you wish to apply the probe duite, select the monitoring scout you wish to use, and click the Add systems to probe suite button to complete the creation of the probe suite.

You can either delete or detach probes from the suite. Detaching a probe disassociates the probes from the suite and converts them to system-specific probes for the specified system. This means that changes to the detached probes only effect that system. Deleting a probe removes it from the Suite for all systems.

To remove probes from the Probe Suite do the following:

1 From the *Monitoring* > *Probe Suites* page, click on the title of the probe suite you wish to alter.

2 Select the *Probes* sub-tab.

3 Check the box next to the probe you wish to remove.

4 Click the Delete probes from Probe Suites button.

You may also remove a system from the probe suite. There are two ways to accomplish this. The first method is to detach the system from the probe suite. When you do so, the system still has the same probes assigned to it. However, you now have the ability to configure these probes individually without affecting any other systems. For more information about removing probes from an individual system, refer to the section called “*System Details* > *Monitoring* — [Mon]” (page 78).

To detach a system from the suite:

1. From the *Monitoring* > *Probe Suites* page, click the title of the probe suite you wish to alter.

2. Select the *Systems* sub-tab.

3. Check the box next to the system(s) you wish to remove from the probe suite.

4. Click the Detach System(s) from Probe Suite button

The second method is to remove the system from the suite. This removes the system from the suite and deletes all running probes from the system.

NOTE

This action deletes all of the probe suites' probes from the system as well as all of the historical time series and event log data. This action is irreversible.

To remove a system from the probe suite and delete all associated probes from the system:

1. From the *Monitoring* > *Probe Suites* page, click on the title of the probe suite you wish to alter.

2. Select the *Systems* sub-tab.

3. Check the box next to the system(s) you wish to remove from the probe suite.

4. Click the Remove System(s) from Probe Suite button.

Finally, as with single probes, you may download a CSV file containing information about probe suites. Click the *Download CSV* link at the bottom of the *Monitoring* > *Probe Suites* page to download the file.

3.10.5 General Config — [Mon]

Collects information that is universally applicable to your monitoring infrastructure. Modifying anything on this page causes the monitoring services on the SUSE Manager to reset. It also schedules restart events for the monitoring services on all monitoring-enabled SUSE Manager servers that connect to SUSE Manager. This is done so that the monitoring services on these servers immediately reload their configuration.

Typically, the defaults provided in other fields are acceptable, since they are derived from your SUSE Manager installation. Nevertheless, you may use the fields on this page to alter your monitoring configuration. For instance, you may change your mail exchange server here. This page also allows you to alter the destination of all administrative emails from SUSE Manager. When finished, click Update Config.

3.11 Admin

The *Admin* page allows SUSE Manager customers to manage the basic configuration, including creating and managing the organizations feature. Only the SUSE Manager administrator can access the *Admin* page.

3.11.1 *Admin > Organizations*

The *multiple organizations* feature allows administrators to create and manage multiple organizations across SUSE Manager. The organizations feature allows administrators to appropriate software and system entitlements across various organizations, as well as control an organization's access to systems management tasks. For more information about using the multiple organizations feature, refer to Chapter 5, *Multiple Organizations* (page 183).

3.11.2 *Admin > SUSE Manager Configuration*

This tab is broken down into subtabs that allow you to configure most aspects of SUSE Manager. Once changes have been made, it is important to restart SUSE Manager, which may be accomplished on the final tab.

Admin > SUSE Manager Configuration > General

This page allows you to alter the most basic settings, such as the admin email address.

Admin > SUSE Manager Configuration > Monitoring

This page allows you to configure the monitoring aspects of this SUSE Manager. However, this page is only available on monitor-enabled systems. See Section 3.10, “Monitoring — [Mon]” (page 153) for more details. The local mail exchanger and local main domain are used to mail monitoring notification messages to administration. This is required only if you intend to receive alert notifications from probes. If you do, provide the mail server (exchanger) and domain to be used. Note that sendmail must be configured to handle email redirects of notifications. When finished, click *Update Config*.

Admin > SUSE Manager Configuration > Certificate

The *SUSE Manager Configuration* > *Certificate* page allows you to either upload a new SUSE Manager certificate. To identify the certificate's path, click Browse, navigate to the file, and select it. To input its contents, open your certificate in a text editor, copy all lines, and paste them directly into the large text field at the bottom. SUSE recommends using the file browser as it is less error prone. Click Update to continue. If you receive errors related to DNS, ensure your SUSE Manager server is configured correctly.

Admin > SUSE Manager Configuration > Bootstrap Script

The *SUSE Manager Configuration* > *Bootstrap Script* page allows you to generate a bootstrap script for redirecting client systems from the central Novell Customer Center to SUSE Manager. This script, to be placed in the `/srv/www/htdocs/pub/bootstrap/` directory of SUSE Manager, significantly reduces the effort involved in reconfiguring all systems, which by default obtain packages from the central Novell Customer Center. The required fields are pre-populated with values derived from previous installation steps. Ensure this information is accurate.

Checkboxes offer options for including built-in security SSL and GNU Privacy Guard (GPG) features, both of which are advised. In addition, you may enable remote command acceptance and remote configuration management of the systems to be bootstrapped here. Both features are useful for completing client configuration. Finally, if you are using an HTTP proxy server, complete the related fields. When finished, click Generate Bootstrap Script.

Admin > SUSE Manager Configuration > Organizations

The *SUSE Manager Configuration* > *Organizations* page contains details about the organizations feature of SUSE Manager, as well as links to quickly get started creating and configuring organizations. For more information about configuring organizations, refer to Section 3.11.1, “*Admin* > *Organizations*” (page 161).

Admin > SUSE Manager Configuration > Restart

The *SUSE Manager Configuration* > *Restart* page contains the final step in configuring SUSE Manager. Click the Restart button to restart SUSE Manager in order to incorporate all of the configuration options added on the previous screens. Note that it will take between four and five minutes for the restart to finish.

3.12 Help

The *Help* pages provide access to the full suite of documentation and support available to SUSE Manager users. Click Help in the *Overview* category to see a list of options available to you.

3.12.1 Reference Guide

The *Reference Guide* page takes you to this same document, the most comprehensive set of instructions for using SUSE Manager. Note that links to other technical guides may also appear in the left navigation bar, depending on the entitlement level and product offering of the account with which you logged in.

3.12.2 SUSE Manager Installation Guide

Implementing a fully functional SUSE Manager requires more than installing software and a database. Client systems must be configured to use SUSE Manager. Custom packages and channels should be created for optimal use. Since these tasks extend beyond the basic installation, they are covered in detail in other guides, as well as this *SUSE Manager Installation Guide*.

Detailed information regarding SUSE Manager server and its installation and initial configuration.

3.12.3 Client Configuration Guide

By default, all SUSE client applications are configured to communicate with Novell Customer Center. When connecting clients to SUSE Manager, many of these settings must be altered. Altering client settings for a system or two may be relatively simple. A large enterprise environment, containing hundreds or thousands of systems, will likely benefit from the mass reconfiguration steps described here.

The *Client Configuration Guide* is a best practices manual intended to help customers of SUSE Manager configure their client systems effeciently.

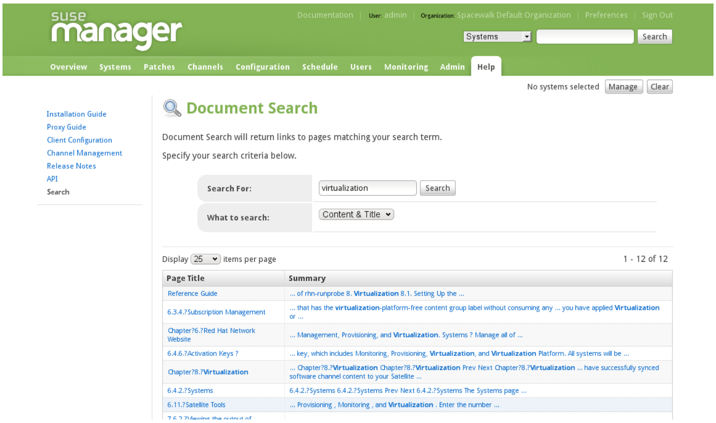
3.12.4 Release Notes

The *Release Notes* page lists the notes accompanying every recent release of SUSE Manager. These notes describe all significant changes occurring in a given release cycle, from major enhancements to the user interface to minor changes to the related documentation.

3.12.5 Search

The *Documentation Search* page features a robust search engine that indexes and searches SUSE Manager documentation.

Figure 3.20 *Documentation Search*



Document Search

Document Search will return links to pages matching your search term.

Specify your search criteria below.

Search For:	virtualization [Search]
What to search:	Content & Title

Display 25 items per page 1 - 12 of 12

Page Title	Summary
Reference Guide	... of rhn-runprobe 8. **Virtualization** 8.1. Setting Up the ...
6.3.4.?Subscription Management	... that has the **virtualization**-platform-free content group label without consuming any ... you have applied **Virtualization** or ...
Chapter?6.?Red Hat Network Website	... Management, Provisioning, and **Virtualization**. Systems ? Manage all of ...
6.4.6.?Activation Keys ?	... key, which includes Monitoring, Provisioning, **Virtualization**, and **Virtualization** Platform. All systems will be ...
Chapter?8.?**Virtualization**	... Chapter?8.?**Virtualization** Chapter?8.?**Virtualization** Prev Next Chapter?8.?**Virtualization** ... have successfully synced software channel content to your Satellite ...
6.4.2.?Systems	6.4.2.?Systems 6.4.2.?Systems Prev Next 6.4.2.?Systems The Systems page ...
6.11.?Satellite Tools	... Provisioning , Monitoring , and **Virtualization** . Enter the number ...
7.6.2.?Viewing the output of	

Users can search the available online documentation and filter them according to the following choices in the *What to Search* drop-down menu:

- *Content & Title* — Search both the title heading or body content of all available documents
- *Free Form* — Search documents and indices for any keyword matches, which broadens search results.
- *Content* — Search only the body content of documentation for more specific matches
- *Title* — Search only the titles heading of the documentation for targeted, specific search results.

The *Free Form* field addtionally allows you to search using *field names* that you prepend to search queries and filter results in that field.

For example, if you wanted to search all of the SUSE Manager manuals for the word **`Virtualization`** in the title and **`install`** in the content, type the follwing in the *Free Form* field:

```
title:Virtualization and content:install
```

Other supported field names for documentation search include:

- **`url`** — Search the URL for a particular keyword
- **`title`** — Search titles for a particular keyword
- **`content`** — Search the body of the documentation for a particular keyword

If there are several pages of search results, you can limit the amount of visible results shown on one page by clicking the *Display* `quantity` *items per page* drop-down menu, which offers between 10 and 500 results per page.

To move between pages, click the right or left angle brackets (> to go forward or < to go backward)

Monitoring

4

The entitlement allows you to perform a whole host of actions designed to keep your systems running properly and efficiently. With it, you can keep close watch on system resources, network services, databases, and both standard and custom applications.

Monitoring provides both real-time and historical state-change information, as well as specific metric data. You are not only notified of failures immediately and warned of performance degradation before it becomes critical, but you are also given the information necessary to conduct capacity planning and event correlation. For instance, the results of a probe recording CPU usage across systems would prove invaluable in balancing loads on those systems.

Monitoring entails establishing notification methods, installing probes on systems, regularly reviewing the status of all probes, and generating reports displaying historical data for a system or service. This chapter seeks to identify common tasks associated with the Monitoring entitlement. Remember, virtually all changes affecting your Monitoring infrastructure must be finalized by updating your configuration, through the *Scout Config Push* page.

4.1 Prerequisites

Before attempting to implement monitoring within your infrastructure, ensure you have all of the necessary tools in place. At a minimum, you need:

- Monitoring entitlements — These entitlements are required for all systems that are to be monitored. Monitoring is supported only on SUSE Linux Enterprise systems.

- SUSE Manager with monitoring — Monitoring systems must be connected to SUSE Manager with a base operating system of SUSE Linux Enterprise 11 Refer to the SUSE Manager Installation Guide within *Help* for installation instructions.

- Monitoring administrator — This role must be granted to users installing probes, creating notification methods, or altering the monitoring infrastructure in any way. (Remember, the SUSE Manager administrator automatically inherits the abilities of all other roles within an organization and can therefore conduct these tasks.). Assign this role through the *User Details* page for the user.

- SUSE Manager monitoring daemon — This daemon, along with the SSH key for the scout, is required on systems that are monitored in order for the internal process monitors to be executed. You may, however, be able to run these probes using the systems' existing SSH daemon (`sshd`). Refer to Section 4.2, “SUSE Manager Monitoring Daemon (rhnmd)” (page 168) for installation instructions and a quick list of probes requiring this secure connection. Refer to Appendix C, *Probes* (page 235) for the complete list of available probes.

4.2 SUSE Manager Monitoring Daemon (rhnmd)

To get the most out of your monitoring entitlement, Red Hat suggests installing the SUSE Manager monitoring daemon on your client systems. Based upon OpenSSH, `rhnmd` enables SUSE Manager to communicate securely with the client system to access internal processes and retrieve probe status.

Please note that the SUSE Manager monitoring daemon requires that monitored systems allow connections on port 4545. You may avoid opening this port and installing the daemon altogether by using `sshd` instead. Refer to Section 4.2.3, “Configuring SSH” (page 170) for details. docbook_4

4.2.1 Probes requiring the daemon

An encrypted connection, either through the SUSE Manager monitoring daemon or `sshd`, is required on client systems for the following probes to run:

- Linux::CPU Usage
- Linux::Disk IO Throughput
- Linux::Disk Usage
- Linux::Inodes
- Linux::Interface Traffic
- Linux::Load
- Linux::Memory Usage
- Linux::Process Counts by State
- Linux::Process Count Total
- Linux::Process Health
- Linux::Process Running
- Linux::Swap Usage
- Linux::TCP Connections by State
- Linux::Users
- Linux::Virtual Memory
- LogAgent::Log Pattern Match
- LogAgent::Log Size
- Network Services::Remote Ping
- Oracle::Client Connectivity
- General::Remote Program
- General::Remote Program with Data

Note that all probes in the Linux group have this requirement.

4.2.2 Installing the SUSE Manager Monitoring Daemon

Install the SUSE Manager Monitoring Daemon to prepare systems for monitoring with the probes identified in Section 4.2.1, “Probes requiring the daemon” (page 168). Note that the steps in this section are optional if you intend to use `sshd` to allow secure connections between the monitoring infrastructure and the monitored systems. Refer to Section 4.2.3, “Configuring SSH” (page 170) for instructions.

The `rhnmd` package can be found in the `client tools` channel for all SUSE Linux Enterprise distributions. To install it:

1. Subscribe the systems to be monitored to the `client tools` channel associated with the system. This can be done individually through the *System Details* > *Channels* > *Software* subtab or for multiple systems at once through the *Channel Details* > *Target Systems* tab.

2. Once subscribed, open the *Channel Details* > *Packages* tab and find the `rhnmd` package (under 'R').

3. Click the package name to open the *Package Details* page. Go to the *Target Systems* tab, select the desired systems, and click Install Packages.

4. Install the SSH public key on all client systems to be monitored, as described in Section 4.2.4, “Installing the SSH key” (page 171).

5. Start the SUSE Manager monitoring daemon on all client systems using the command:

   ```
   rcrhnmd start
   ```

6. When adding probes requiring the daemon, accept the default values for *RHNMD User* and *RHNMD Port*: **`nocpulse`** and **`4545`**, respectively.

4.2.3 Configuring SSH

If you wish to avoid installing the SUSE Manager monitoring daemon and opening port 4545 on client systems, you may configure `sshd` to provide the encrypted connection required between the systems and SUSE Manager. This may be especially desirable if you already have sshd running. To configure the daemon for monitoring use:

1. Ensure the SSH package is installed on the systems to be monitored:

   ```
   rpm -qi openssh
   ```

2. Identify the user to be associated with the daemon. This can be any user available on the system, as long as the required SSH key can be put in the user's ~/.ssh/authorized_keys file.

3. Identify the port used by the daemon, as identified in its /etc/ssh/sshd_config configuration file. The default is port 22.

4. Install the SSH public key on all client systems to be monitored, as described in Section 4.2.4, “Installing the SSH key” (page 171).

5. Start the sshd on all client systems using the command:

   ```
   service sshd start
   ```

6. When adding probes requiring the daemon, insert the values derived from steps 2 and 3 in the *RHNMD User* and *RHNMD Port* fields.

4.2.4 Installing the SSH key

Whether you use rhnmd or sshd, you must install the SUSE Manager monitoring daemon public SSH key on the systems to be monitored to complete the secure connection. To install it:

1. Navigate to the *Monitoring* > *Scout Config Push* page on the SUSE Manager interface and click the name of the Scout that will monitor the client system. The SSH id _dsa.pub key is visible on the resulting page.

2. Copy the character string (beginning with ssh-dss and ending with the hostname of the SUSE Manager server).

3. Select the systems you want to send the key to from the *Systems*, then selecting *Systems* from the left menu, and finally clicking the checkbox next to the systems you want to send the SSH key and click the Manage button at the top.

4. From the *System Set Manager*, click *Run remote commands*, then in the *Script* text box, type the following line:

   ```
   #!/bin/sh
   cat <<EOF >> ~nocpulse/.ssh/authorized_keys
   ```

   Then, press Enter and then paste the SSH Key. The result should look similar to the following:

   ```
   #!/bin/sh
   cat <<EOF >> /opt/nocpulse/.ssh/authorized_keys
   ssh-dss AABBAB3NzaC3kc3MABCCBAJ4cmyf5jt/ihdtFbNE1YHsT0np0SYJz7xk
   hzoKUUWnZmOUqJ7eXoTbGEcZjZLppOZgzAepw1vUHXfa/L9XiXvsV8K5Qmcu70h0
   1gohBIder/1I1QbHMCgfDVFPtfV5eedau4AAACAc99dHbWhk/dMPiWXgHxdI0vT2
   SnuozIox2klmfbTeO4Ajn/Ecfxqgs5diat/NIaeoItuGUYepXFoVv8DVL3wpp45E
   02hjmp4j2MYNpc6Pc3nPOVntu6YBv+whB0VrsVzeqX89u23FFjTLGbfYrmMQflNi
   j8yynGRePIMFhI= root@example.com
   EOF
   ```

5. Set the date and time you want for the action to take place, then click Schedule Remote Command.

Once the key is in place and accessible, all probes that require it should allow ssh connections between the Monitoring infrastructure and the monitored system. You may then schedule probes requiring the monitoring daemon to run against the newly configured systems.

4.3 mysql package

If your SUSE Manager will serve monitoring-entitled client systems against which you wish to run MySQL probes, you must configure the mysql package on the SUSE Manager. Refer to Appendix C, *Probes* (page 235) for a listing of all available probes.

Subscribe the SUSE Manager to the SUSE Linux Enterprise base channel and install the mysql package either through the zypper up or YaST

Once finished, your SUSE Manager may be used to schedule MySQL probes.

4.4 Notifications

In addition to viewing probe status within the SUSE Manager interface, you may be notified whenever a probe changes state. This is especially important when monitoring mission-critical production systems.

To enable probe notifications within SUSE Manager, you must have identified a mail exchange server and mail domain during installation of your SUSE Manager and configured sendmail to properly handle incoming mail. Refer to the *Installation* chapter of the *SUSE Manager Installation Guide* for details.

4.4.1 Creating Notification Methods

Notifications are sent via a *notification method*, an email or pager address associated with a specific SUSE Manager user. Although the address is tied to a particular user account, it may serve multiple administrators through an alias or mailing list. Each user account can contain multiple notification methods. To create a notification method:

1. Log into the SUSE Manager website as either an SUSE Manager administrator or monitoring administrator.

2. Navigate to the *User Details > Notification Methods* tab and click *create new method*.

3. Enter an intuitive, descriptive label for the method name, such as **`DBA day email`**, and provide the correct email or pager address. Remember, the labels for all notification methods are available in a single list during probe creation, so they should be unique to your organization.

4. Select the checkbox if you desire abbreviated messages to be sent to the pager. This shorter format contains only the probe state, system hostname, probe name, time of message, and Send ID. The standard, longer format displays additional message headers, system and probe details, and instructions for response.

5. When finished, click Create Method. The new method shows up in the *User Details > Notification Methods* tab and the *Notification* page under the top *Monitoring* category. Click its name to edit or delete it.

6. While adding probes, select the *Probe Notifications* checkbox and select the new notification method from the resulting dropdown menu. Notification methods assigned to probes cannot be deleted until they are dis-associated from the probe.

4.4.2 Receiving Notifications

If you create notification methods and associate them with probes, you must be prepared to receive them. These notifications come in the form of brief text messages sent to either email or pager addresses. Here is an example of an email notification:

As you can see, the longer email notifications contain virtually everything you would need to know about the associated probe. In addition to the probe command, run time, system monitored, and state, the message contains the *Send ID*, which is a unique character string representing the precise message and probe. In the above message, the Send ID is `01dc8hqw`.

Pager notifications, by necessity, contain only the most important details, namely the subject of the email message (containing state, system, probe, and time) and the Send ID. Here is an example pager notification:

4.4.3 Redirecting Notifications

Upon receiving a notification, you may redirect it by including advanced notification rules within an acknowledgment email. Just reply to the notification and include the desired option. These are the possible redirect options, or *filter types*:

- ACK METOO — Sends the notification to the redirect destination(s) *in addition to* the default destination.
- ACK SUSPEND — Suspends the notification method for a specified time period.
- ACK AUTOACK — Does not change the destination of the notification, but automatically acknowledges matching alerts as soon as they are sent.
- ACK REDIR — Sends the notification to the redirect destination(s) *instead of* the default destination.

The format of the rule should be *`filter_type probe_type duration email_address`* where *`filter_type`* indicates one of the previous advanced commands, *`probe_type`* indicates probe or system, *`duration`* indicates the length of time for the redirect, and *`email_address`* indicates the intended recipient. For example:

```
ACK METOO system 1h boss@domain.com
```

Capitalization is not required. Duration can be listed in minutes (m), hours (h), or days (d). Email addresses are needed only for redirects (REDIR) and supplemental (METOO) notifications.

The description of the action contained in the resulting email defaults to the command entered by the user. The reason listed is a summary of the action, such as `email ack redirect by user@domain.com` where user equals the sender of the email.

NOTE

You can halt or redirect almost all probe notifications by replying to a notification emails with a variation of the command `ack suspend host`. However, you cannot halt SUSE Manager probe notifications by responding to a probe with `ack suspend host` or other redirect responses. These probes require you to change the notifications within the SUSE Manager web interface.

4.4.4 Filtering Notifications

Since notifications can be generated whenever a probe changes state, simple changes in your network can result in a flood of notifications. The creation, cancellation, and application of Notification filters is discussed in detail in the section called "*Notification > Filters*" (page 156).

4.4.5 Deleting Notification Methods

Theoretically, removing notification methods should be as easy as creating them. After all, you must populate no fields to conduct the deletion and a button exists for this explicit purpose. However, existing relationships between methods and probes can complicate this process. Follow these steps to remove a notification method:

1. Log into the SUSE Manager website as an SUSE Manager administrator or monitoring administrator.

2. Navigate to the *Monitoring* > *Notifications* page and click the name of the method to be removed.

3. On the *User Details* > *Notification Methods* tab, click *delete method*. If the method is not associated with any probes, you are presented with a confirmation page. Click Confirm Deletion. The notification method is removed.

   NOTE

   Since both the notification method name and address can be edited, consider updating the method rather than deleting it. This redirects notifications from all probes using the method without having to edit each probe and create a new notification method.

4. If the method is associated with one or more probes, you are presented with a list of the probes using the method and the systems to which the probes are attached instead of a confirmation page. Click the probe name to go directly to the *System Details* > *Probes* tab.

5. On the *System Details* > *Probes* tab, select another notification method and click Update Probe.

6. You may now return to the *Monitoring* > *Notifications* page and delete the notification method.

4.5 Probes

Now that the SUSE Manager monitoring daemon has been installed and notification methods have been created, you may begin installing probes on your monitoring-entitled systems. If a system is entitled to monitoring, a *Probes* tab appears within its *System Details* page. This is where you will conduct most probe-related work.

4.5.1 Managing Probes

To add a probe to a system, the system must be entitled to monitoring. Further, you must have access to the system itself, either as the system's root user, through the system group administrator role, or as the SUSE Manager administrator. Then:

1. Log into the SUSE Manager website as either an SUSE Manager administrator or the system group administrator for the system.

2. Navigate to the *System Details* > *Probes* tab and click *create new probe*.

3. On the *System Probe Creation* page, complete all required fields. First, select the probe command group. This alters the list of available probes and other fields and requirements. Refer to Appendix C, *Probes* (page 235) for the complete list of probes by command group. Remember that some probes require the SUSE Manager network monitoring daemon to be installed on the client system.

4. Select the desired probe command and the monitoring scout. Enter a brief but unique description for the probe.

5. Select the *Probe Notifications* checkbox to receive notifications when the probe changes state. Use the *Probe Check Interval* dropdown menu to determine how often notifications should be sent. Selecting **`1 minute`** (and the *Probe Notification* checkbox) means you will receive notifications every minute the probe surpasses its CRITICAL or WARNING thresholds. Refer to Section 4.4, “Notifications” (page 173) to find out how to create notification methods and acknowledge their messages.

6. Use the *RHNMD User* and *RHNMD Port* fields, if they appear, to force the probe to communicate via `sshd`, rather than the SUSE Manager monitoring daemon. Refer to Section 4.2.3, “Configuring SSH” (page 170) for details. Otherwise, accept the default values of **`nocpulse`** and **`4545`**, respectively.

7. If the *Timeout* field appears, review the default value and adjust to meet your needs. Most but not all timeouts result in an UNKNOWN state. If the probe's metrics are time-based, ensure the timeout is not less than the time allotted to thresholds. Otherwise, the metrics serve no purpose, as the probe will time out before any thresholds are crossed.

8. Use the remaining fields to establish the probe's alert thresholds, if applicable. These CRITICAL and WARNING values determine at what point the probe has changed

state. Refer to Section 4.5.2, “Establishing Thresholds” (page 178) for best practices regarding these thresholds.

9. When finished, click Create Probe. Remember, you must commit your monitoring configuration change on the *Scout Config Push* page for this to take effect.

To delete a probe, navigate to its *Current State* page (by clicking the name of the probe from the *System Details* > *Probes* tab), and click *delete probe*. Finally, confirm the deletion.

4.5.2 Establishing Thresholds

Many of the probes offered by SUSE Manager contain alert thresholds that, when crossed, indicate a change in state for the probe. For instance, the Linux::CPU Usage probe allows you to set CRITICAL and WARNING thresholds for the percent of CPU used. If the monitored system reports 75 percent of its CPU used, and the WARNING threshold is set to 70 percent, the probe will go into a WARNING state. Some probes offer a multitude of such thresholds.

In order to get the most out of your monitoring entitlement and avoid false notifications, it is recommended to run your probes without notifications for a time to establish baseline performance for each of your systems. Although the default values provided for probes may suit you, every organization has a different environment that may require altering thresholds.

4.5.3 Monitoring the SUSE Manager Server

In addition to monitoring all of your client systems, you may also use SUSE Manager to monitor your SUSE Manager server. To monitor your SUSE Manager server, find a system monitored by the server, and go to that system's *System Details* > *Probes* tab.

Click *create new probe* and select the **`SUSE Manager`** probe command group. Next, complete the remaining fields as you would for any other probe. Refer to Section 4.5.1, “Managing Probes” (page 177) for instructions.

Although the SUSE Manager server appears to be monitored by the client system, the probe is actually run from the server on itself. Thresholds and notifications work normally.

NOTE

Any probes that require SUSE Manager network monitoring daemon connections cannot be used against a SUSE Manager or a SUSE Manager proxy server on which monitoring software is running. This includes most probes in the Linux command group as well as the log agent probes and the remote program probes. Use the SUSE Manager command group probes to monitor SUSE Manager and SUSE Manager proxy servers. In the case of proxy scouts, the probes are listed under the system for which they are reporting data.

4.6 Troubleshooting

Though all monitoring-related activities are conducted through the SUSE Manager website, SUSE provides access to some command line diagnostic tools that may help you determine the cause of errors. To use these tools, you must be able to become the **nocpulse** user on the SUSE Manager server conducting the monitoring.

First log into the SUSE Manager server as root. Then switch to the **nocpulse** user with the following command:

```
su - nocpulse
```

You may now use the diagnostic tools described within the rest of this section.

4.6.1 Examining Probes with rhn-catalog

To thoroughly troubleshoot a probe, you must first obtain its probe ID. You may obtain this information by running `rhn-catalog` on the SUSE Manager server as the **nocpulse** user. The output will resemble:

```
2 ServiceProbe on exa1.example.com (199.168.36.245): test 2
3 ServiceProbe on exa2.example.com (199.168.36.173): rhel2.1 test
4 ServiceProbe on exa3.example.com (199.168.36.174): SSH
5 ServiceProbe on exa4.example.com (199.168.36.175): HTTP
```

The probe ID is the first number, while the probe name (as entered in the SUSE Manager website) is the final entry on the line. In the above example, the `5` probe ID corresponds to the probe named `HTTP`.

Further, you may pass the --commandline (-c) and --dump (-d) options along with a probe ID to rhn-catalog to obtain additional details about the probe, like so:

```
rhn-catalog --commandline --dump 5
```

The --commandline option yields the command parameters set for the probe, while --dump retrieves everything else, including alert thresholds and notification intervals and methods.

The command above will result in output similar to:

```
5 ServiceProbe on exa4.example.com (199.168.36.175  ):
linux:cpu usage
      Run as: Unix::CPU.pm --critical=90 --sshhost=199.168.36.175
--warn=70 --timeout=15 --sshuser=nocpulse
--shell=SSHRemoteCommandShell --sshport=4545
```

Now that you have the ID, you use it with rhn-runprobe to examine the probe's output. Refer to Section 4.6.2, “Viewing the output of rhn-runprobe” (page 180) for instructions.

4.6.2 Viewing the output of rhn-runprobe

Now that you have obtained the probe ID with rhn-catalog, use it in conjunction with rhn-runprobe to examine the complete output of the probe. Note that by default, rhn-runprobe works in test mode, meaning no results are entered in the database. Here are its options:

Table 4.1 *rhn-runprobe Options*

Option	Description
--help	List the available options and exit.
--probe=*PROBE_ID*	Run the probe with this ID.
--prob_arg=*PARAMETER*	Override any probe parameters from the database.

Option	Description
`--module=PERL_MODULE`	Package name of alternate code to run.
`--log=all=LEVEL`	Set log level for a package or package prefix.
`--debug=LEVEL`	Set numeric debugging level.
`--live`	Execute the probe, enqueue data and send out notifications (if needed).

At a minimum, you should include the `--probe` option, the `--log` option, and values for each. The `--probe` option takes the probeID as its value and the `--log` option takes the value "all" (for all run levels) and a numeric verbosity level as its values. Here is an example:

```
rhn-runprobe --probe=5 --log=all=4
```

The above command requests the probe output for probeID 5, for all run levels, with a high level of verbosity.

More specifically, you may provide the command parameters derived from `rhn-catalog`, like so:

```
rhn-runprobe 5 --log=all=4 --sshuser=nocpulse --sshport=4545
```

This yields verbose output depicting the probe's attempted execution. Errors are clearly identified.

Multiple Organizations 5

SUSE Manager supports the creation and management of *multiple organizations* within one SUSE Manager installation, allowing for the division of systems, content, and subscriptions across different organizations or specific groups. This chapter guides the user through basic setup tasks and explains the concepts of multiple organization creation and management within SUSE Manager.

5.1 Recommended Models for Using Multiple Organizations

The following examples detail two possible scenarios using the multiple organizations (or multi-org) feature. You may create additional organizations on your SUSE Manager and start using those organizations at whatever pace makes the most sense for you. It is a good idea to create an additional organization and use it on a trial basis for a limited set of systems/users to fully understand the impact of a multi-org SUSE Manager on your organization's processes and policies.

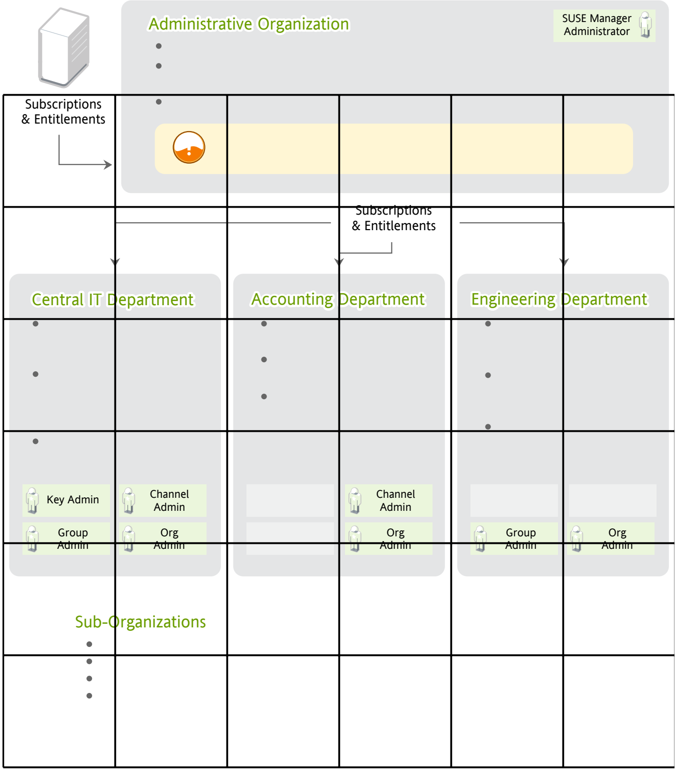
5.1.1 Centrally-Managed SUSE Manager for A Multi-Department Organization

In this first scenario, the SUSE Manager is maintained by a central group within a business or other organization (refer to Figure 5.1, "Centralized SUSE Manager Management for Multi-Department Organization" (page 185)). The SUSE Manager administrator of organization 1 (the administrative organization created during SUSE Manager configuration) treats organization 1 (the “administrative organization”) as a staging area for software and system subscriptions and entitlements.

The SUSE Manager administrator's responsibilities include the configuration of SUSE Manager (any tasks available under the *Admin* area of the web interface), the creation and deletion of additional SUSE Manager organizations, and the allocation and removal of software and system subscriptions and entitlements.

Additional organizations in this example are mapped to departments within a company. One way to decide what level to divide the various departments in an organization is to think about the lines along which departments purchase subscriptions and entitlements for use with SUSE Manager. To maintain centralized control over organizations in the SUSE Manager, create an organization administrator account in each subsequently created organization so that you may access that organization for any reason.

Figure 5.1 Centralized SUSE Manager Management for Multi-Department Organization



5.1.2 Decentralized Management of Multiple Third Party Organizations

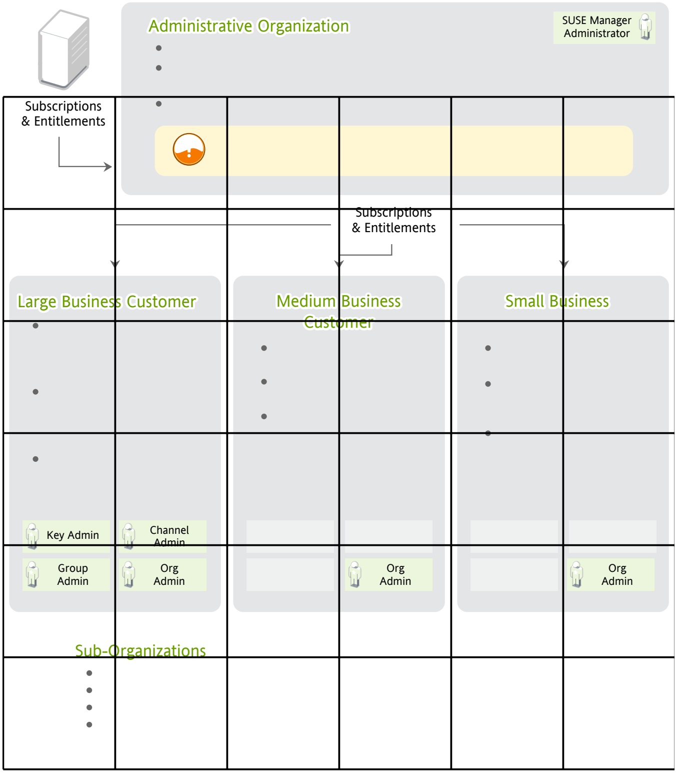
In this example, SUSE Manager is maintained by a central group, but each organization is treated separately without relations or ties to the other organizations on SUSE Manager. Each organization may be a customer of the group that manages the SUSE Manager application itself.

While a SUSE Manager consisting of sub-organizations that are all part of the same company may be an environment more tolerant of sharing systems and content between organizations, in this decentralized example sharing is less tolerable. Administrators can allocate entitlements in specific amounts to each organization. Each organization will have access to all Novell content synced to SUSE Manager if the organization has software channel entitlements for the content.

However, if one organization pushes custom content to their organization, it will not be available to other organizations. You cannot provide custom content that is available to all or select organizations without re-pushing that content into each organization.

In this scenario, SUSE Manager administrators may want to reserve an account in each organization to have login access. For example, if you are using SUSE Manager to provide managed hosting services to external parties, you could reserve an account for yourself so to access systems in that organization and push content.

Figure 5.2 *Decentralized SUSE Manager Management for Multi-Department Organization*



5.1.3 General Tips for Multi-Org Usage

Regardless of the specific model above you choose in the management of your multi-org SUSE Manager, the following best practices tips can help.

It is not recommended to use the administrative organization (organization #1) for registering systems and creating users in any situation unless you intend to the use SUSE Manager as a single organization SUSE Manager or are in the process of migrating from a single organization SUSE Manager to a multiple organization SUSE Manager. This is due to the following reasons:

1. The administrative organization is treated as a special case with respect to entitlements. You can only add or remove entitlements to this organization implicitly by removing them or adding them from the other organizations on SUSE Manager.

2. The administrative organization is intended to be a staging area for subscriptions and entitlements. When you associate SUSE Manager with a new certificate, any new entitlements will by granted to this organization by default. In order to make those new entitlements available to other organizations on SUSE Manager, you will need to explicitly allocate those entitlements to the other organizations from the administrative organization.

Certificate Has Less Entitlements Than I Am Using

If you have issued a new SUSE Manager certificate and it contains less entitlements than the systems in the organizations your SUSE Manager are consuming, you will be unable to activate this new certificate when uploading it through the SUSE Manager's web interface under *Admin* > *SUSE Manager Configuration* > *Certificate*, or by running the `rhn-satellite-activate` command. You will get an error stating that there are insufficient entitlements in the certificate.

There are a few ways you can reduce SUSE Manager entitlement usage in order to activate your new certificate. It is recommended evaluating each organization's entitlement usage on and decide which organizations should relinquish some entitlements and still function properly. You can then contact each organization administrator directly and request that they unentitle or delete the system profiles of any extraneous systems in their organizations. If you have login access to these organizations, you can do this yourself. Logged in under a SUSE Manager administrator, you cannot decrement the allocated entitlements to an organization below the number of entitlements that organization has actively associated with system profiles.

There are some situations in which you need to free entitlements and do not have a lot of time to do so, and may not have access to each organization in order to do this yourself. There is an option in multi-org SUSE Manager that allows the SUSE Manager administrator to decrement an organization's entitlement count below their usage. This method must be done logged into the administrative organization.

For example, logged into the administrative organization, if your certificate is five system management entitlements shy of being able to cover all registered systems on your SUSE Manager, the five systems that were most recently registered with that organization will be unentitled. This process is described below:

1. Open the `/etc/rhn/rhn.conf` file, set web.force_unentitlement=1

2. Restart SUSE Manager

3. Reduce the allocated entitlements to the desired organizations either via each organization's *Subscriptions* tab or via individual entitlement's *Organizations* tabs.

4. A number of systems in the organization should now be in an *unentitled* state. The number of systems unentitled in the organization will be equal to the difference between the total number of entitlements you removed from the organization and the number of entitlements the organization did not have applied to the systems.

   For example, if you removed 10 entitlements from the organization in Step 3 (page 188), and the organization has four entitlements that were not in use by systems, then six systems in the organization will be unentitled.

After you have the sufficient number of entitlements required, you should then be able to activate your new SUSE Manager certificate. Note that modifying the *`web.force_unentitlement`* variable is only necessary to decrement an organization's allocated entitlements below what they are using. If an organization has more entitlements than are being actively used, you do not need to set this variable to remove them.

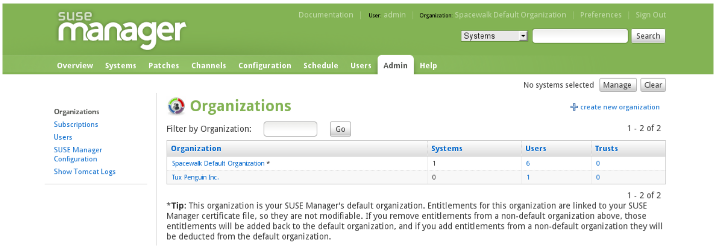
Certificate Has More Entitlements Than I Am Using

If you are issued a new SUSE Manager certificate and it has more entitlements than are being consumed on your SUSE Manager, any extra entitlements will be assigned to the administrative organization. If you log into the web interface as the SUSE Manager administrator, you will then be able to allocate these entitlements to other organizations. The previously-allocated entitlements to other organizations will be unaffected.

5.2 *Admin > Organizations*

The *Organizations* Web interface allows administrators to view, create, and manage multiple organizations across SUSE Manager. Administrators can allocate software and system entitlements across various organizations, as well as control an organization's access to systems management tasks.

Figure 5.3 *Admin*



1 - 2 of 2

Organization	Systems	Users	Trusts
Spacewalk Default Organization *	1	6	0
Tux Penguin Inc.	0	1	0

1 - 2 of 2

***Tip:** This organization is your SUSE Manager's default organization. Entitlements for this organization are linked to your SUSE Manager 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 contains a listing of organizations across the SUSE Manager, with both user and system counts assigned to each organization. The *Organizations* page also features a *Trusts* page for any organizational trusts established. Refer to Section 5.6, “Organizational Trusts” (page 195) for more information about establishing organizational trusts.

5.2.1 *Admin > Organizations > Details*

Clicking on an organization displays the *Details* page, where administrators are provided a summary of various aspects of the organization.

- *Active Users* — The number of users in the organization

- *Systems* — The number of systems subscribed to the organization.

- *System Groups* — The number of groups subscribed to the organization.

- *Activation Keys* — The number of activation keys available to the organization.

- *Autoinstallation Profiles* — The number of autoinstallation profiles available to the organization.

- *Configuration Channels* — The number of Configuration Channels available to the organization.

From this page, you can delete the organization by clicking the *Delete Organization* link.

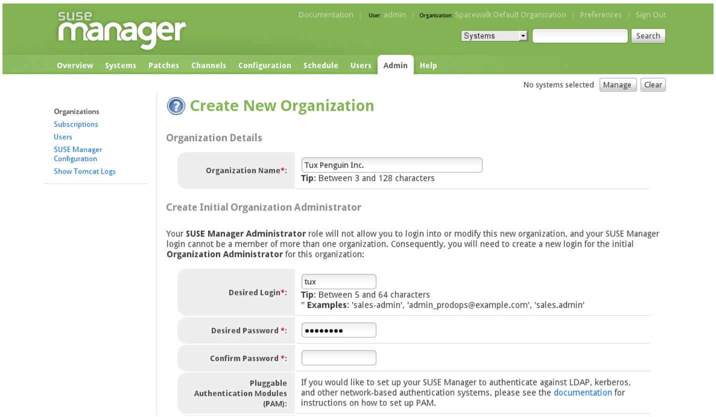
The *Details* page also contains three subtabs: *Users*, *Subscriptions*, and *Trusts*.

5.3 Creating an Organization

The *Create New Organization* page in the SUSE Manager web interface can be accessed by proceeding to *Admin* > *Organizations* > *Create New Organization*.

Administrators can create new organizations and assign entitlements, groups, systems, and users to the group so that organizations can perform administrative tasks on their own without affecting other organizations.

Figure 5.4 *Create New Organization*



Create New Organization

Organization Details

Organization Name*:	Tux Penguin Inc. **Tip:** Between 3 and 128 characters

Create Initial Organization Administrator

Your **SUSE Manager Administrator** role will not allow you to login into or modify this new organization, and your SUSE Manager login cannot be a member of more than one organization. Consequently, you will need to create a new login for the initial **Organization Administrator** for this organization:

Desired Login*:	tux **Tip:** Between 5 and 64 characters " **Examples:** 'sales-admin', 'admin_prodops@example.com', 'sales.admin'
Desired Password *:	••••••••
Confirm Password *:	
Pluggable Authentication Modules (PAM):	If you would like to set up your SUSE Manager to authenticate against LDAP, kerberos, and other network-based authentication systems, please see the documentation for instructions on how to set up PAM.

1. Input the *Organization Name* in the provided text box. The name should be between 3 and 128 characters.

2. Create an administrator for the organization:

   a. Enter a *Desired Login* for the organization administrator, which should be between 3 and 128 characters long.

   b. Create a *Desired Password* and *Confirm* the password.

   c. Type in the *Email* for the organization administrator.

   d. Enter the *First Name* and *Last Name* of the organization administrator.

3. Click the Create Organization button to complete the process.

Once the new organization is created, the *Organizations* page will display with the new organization listed.

TIP

SUSE Manager administrators should consider reserving the administrative organization administrator account for themselves to have the option of logging into this organization for various reasons. If your SUSE Manager is configured for PAM authentication, avoid using PAM accounts for the administrative organization administrator account in new organizations. Instead, create a SUSE Manager-local account for organization administrators and reserve PAM-authenticated accounts for SUSE Manager logins with less elevated privileges in order to discourage users to frequently log into SUSE Manager with elevated privileges, as the potential for making mistakes is higher using these accounts.

Additionally, consider creating a login name for the administrative Organization Administrator account that describes (for example, **`orgadmin-mktg`** or **`eng-dept-admin`**), to match admin login names with the organization.

5.4 Managing Entitlements

One important task after creating a new organization is to assign management entitlements to the new organization. Management system entitlements are a base requirement for an organization to function on SUSE Manager. The number of management entitlements allocated to an organization is equivalent to the maximum number of systems that may register with that organization on SUSE Manager, regardless of the number of software entitlements available. For example, if there are 100 SUSE Linux Enterprise client entitlements but only 50 management system entitlements to an organization, only 50 systems are able to register with that organization.

You must also grant SUSE Manager tools software channel entitlements to each organization. The SUSE Manager `client tools` channel contains various client software required for extended SUSE Manager's functionality, such as clients necessary for configuration management and automated installation support as well as the `rhn -virtualization` package, which is necessary for the entitlements of Xen or KVM virtual guests to be counted correctly corresponding to the number of SUSE Linux Enterprise subscriptions to which they are associated.

Access the *Subscriptions* tab by clicking *Admin* > *Organizations* > *Details* > *Subscriptions*.

The *Subscriptions* tab has two subtabs for managing the software channel and system entitlements for the organization.

5.4.1 *Admin > Subscriptions > Software Channel Entitlements*

The *Software Channel Entitlements Across SUSE Manager* page lists of all entitlements on SUSE Manager, throughout all organizations, as well their usage. Click on a *Entitlement Name* for a more detailed view.

The *Details* subtab for the software channel entitlement contains information about the software channel access granted when subscribed to the entitlement.

The *Organizations* subtab allows SUSE Manager administrators to adjust the number of software channels available to each organization. Type in the number (within the range listed in *Possible Values*) and click the Update button for that organization.

NOTE

Organization administrators that create a custom channel can only use that channel within their organization unless an organizational trust is established between the organizations that want to share the channel. For more information about organizational trusts, refer to Section 5.6, “Organizational Trusts” (page 195).

The *Organizations* subtab also contains broad usage information in the *System-Wide Entitlement Usage* section, including:

- *Total* — The total number of channel entitlements for SUSE Manager.
- *Available* — The number of entitlements currently available for allocation.
- *Usage* — The number of entitlements currently in use by all organizations (aside from the base organization), compared to the total number of entitlements allocated.

For example, if the *Total* column is 100 and the *Available* column is 70, that means 30 entitlements are allocated for organizations. The *Usage* column shows how many of those 30 allocated entitlements are in use by organizations besides the base organization. So if the *Usage* column reads `24 of 30 (80%)`, that means 24 channel entitlements are distributed to SUSE Manager organizations (other than the base organization) out of 30 total allocated.

5.4.2 *Admin > Subscriptions > System Entitlements*

The *System Entitlements Across SUSE Manager* page lists all system entitlements on this SUSE Manager, across all organizations, as well as their usage. Click on the entitlement's name for more details about it.

System entitlements include *Management*, *Provisioning*, *Monitoring*, and *Virtualization*. Enter the number of allocations of each system entitlement in the text box, not to exceed the limit indicated in the *Possible Values*.

The *Details* subtab for the system entitlement contains information about the entitlement and what access it grants.

The *Organizations* subtab allows SUSE Manager administrators to adjust the number of system entitlement allocations available to each organization. Type in the number (within the range listed in *Possible Values*) and click the Confirm Changes button for that organization.

The *Organizations* subtab for the system entitlement also contains broad usage information in the SUSE Manager-wide entitlement usage section, including:

- *Total Allocated* — The number of total entitlements available for the entire SUSE Manager.

- *Entitlement Usage* — The number of entitlements currently being used.

- *Organization Usage* shows the number of organizations that have access to the entitlement.

5.5 Configuring Systems in an Organization

Now that an organization has been created and requisite entitlements assigned to it, you can then assign systems to each organization.

There are two basic ways to register a system with a particular organization:

1. Registering Using Login and Password — If you provide a login and password created for a specified organization, the system will be registered with that organization. For example, if **`user-123`** is a member of the *Central IT* organization on SUSE Manager, the following command on any system would register that system with the *Central IT* organization on your SUSE Manager:

   ```
   mgrreg_ks --username=user-123 --password=foobaz
   ```

   NOTE

   The *`--orgid`* and *`--orgpassword`* parameters in `mgrreg_ks` are *not related* to SUSE Manager registration or SUSE Manager's multiple organizations support.

2. Registering Using An Activation Key — You can also register a system with an organization using an activation key from the organization. Activation keys will register systems with the organization in which the activation key was created. Activation keys are a good registration method to use if you want to allow users to register systems with an organization without providing them login access to that organization. If you want to move systems between organizations, you may also automate the move with scripts using the activation keys.

5.6 Organizational Trusts

Organizations can share their resources with each other by establishing an *organizational trust* in SUSE Manager. An organizational trust is bi-directional, meaning that once a SUSE Manager administrator establishes a trust between two or more organizations, the organization administrator from each organization is free to share as much or as little of their resources as they need to. It is up to each organization administrator to determine what resources to share, and what shared resources from other organizations in the trust to use.

NOTE

Only organization administrators are able to share their custom content; SUSE Manager administrators only allocate system and software entitlements to each organization.

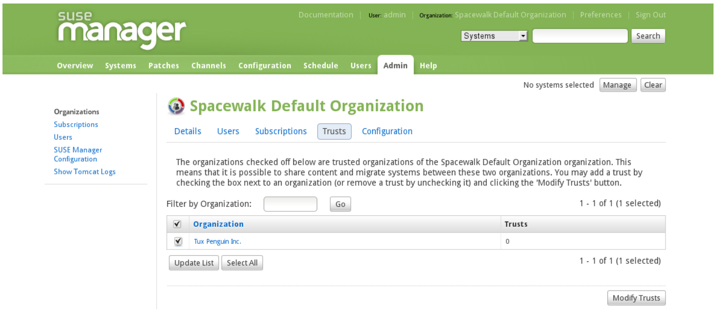
5.6.1 Establishing an Organizational Trust

A SUSE Manager administrator can create a trust between two or more organizations. To do this, click the *Organizations* link on the side menu on the *Admin* main page.

Click the name of one of the organizations and within the *Details* page, click the *Trusts* subtab.

On the *Trusts* subtab, there is a listing of all the other trusts on SUSE Manager. Here you may use the *Filter by Organization* text box to narrow down a long list of organizations to a specific subset.

Figure 5.5 *Organizational Trusts*



Spacewalk Default Organization

The organizations checked off below are trusted organizations of the Spacewalk Default Organization organization. This means that it is possible to share content and migrate systems between these two organizations. You may add a trust by checking the box next to an organization (or remove a trust by unchecking it) and clicking the 'Modify Trusts' button.

Filter by Organization:

1 - 1 of 1 (1 selected)

☑	Organization	Trusts
☑	Tux Penguin Inc.	0

1 - 1 of 1 (1 selected)

Click the checkbox next to the names of the organizations you want to be in the organizational trust with the current organization and click the Modify Trusts button.

5.6.2 Sharing Content Channels between Organizations in a Trust

Once an organizational trust has been established, organizations can now share content such as custom software channels with the other organizations in the trust. There are also three levels of channel sharing that can be applied to each channel for finer-grained channel access control.

NOTE

Organizations cannot share Novell channels because they are available to all organizations that have entitlements to those channels.

To share a custom channel with another organization, perform the following steps:

1. Login to SUSE Manager with the username of the organization administrator.

2. Click on the *Channels* tab.

3. On the side menu, click *Manage Software Channels*.

4. Click the custom channel that you want to share with the other organizations.

5. From the *Channel Access Control* section of the *Details* page, there are three choices for sharing in *Organizational Sharing*.

   - *Private* — Make the channel private so that it cannot be accessed by any organizations except the channel's owner.

   - *Protected* — Allow the channel to be accessed by specific trusted organizations of your choice.

     NOTE

     Choosing *Protected* sharing displays a separate page that prompts you to confirm that you are granting channel access to the organizations by clicking Grant Access and Confirm.

   - *Public* — Allow all organizations within the trust to access the custom channel.

   Click the radio button next to your selection and click Update Channel.

Now, any other organization administrators within the trust for which you have granted access to your custom channel can allow their client systems to install and update packages from the shared channel.

NOTE

If you have a system subscribed to a shared channel, and the organizational administrator of the shared channel changes access rights to the channel, then the system loses that channel. If he changes a base channel right, then the system will have no base channel on the *Systems* page and will not receive updates.

5.6.3 Migrating Systems from One Trusted Organization to Another

In addition to sharing software channels, organizations in a trust can migrate systems to other trusted organizations by using a utility called `migrate-system-profile`.

`migrate-system-profile` usage is based on the command-line, and uses systemIDs and orgIDs as arguments to specify what what is being moved and its destination organization.

To use the `migrate-system-profile` command, you must have the `spacewalk-utils` package installed. You do not need to be logged into the SUSE Manager server to use `migrate-system-profile`; however, if you do not you will need specify the hostname or IP address of the server as a command-line switch.

NOTE

When an organization migrates a system with the `migrate-system-profile` command, the system does not carry any of the previous entitlements or channel subscriptions from the source organization. However, the system's history is preserved, and can be accessed by the new Organization Administrator in order to simplify the rest of the migration process, which includes subscribing to a base channels and granting entitlements.

Using migrate-system-profile

Using `migrate-system-profile` is straightforward. You need to ascertain the ID of the system to be migrated, the ID of the organization the system will migrate to, and the hostname or IP address of the SUSE Manager server if you are running the command from another machine.

The usage from the command line is the following:

```
migrate-system-profile --satellite {SUSE Manager HOSTNAME OR IP}
--systemId={SYSTEM ID} --to-org-id={DESTINATION ORGANIZATION ID}
```

For example, if the Finance department (created as an organization in SUSE Manager with OrgID 2) wants to migrate a workstation (with SystemID 10001020) from the Engineering department, but the Finance Organization Administrator does not have shell access to the SUSE Manager server. The SUSE Manager hostname is *satserver.example.com*.

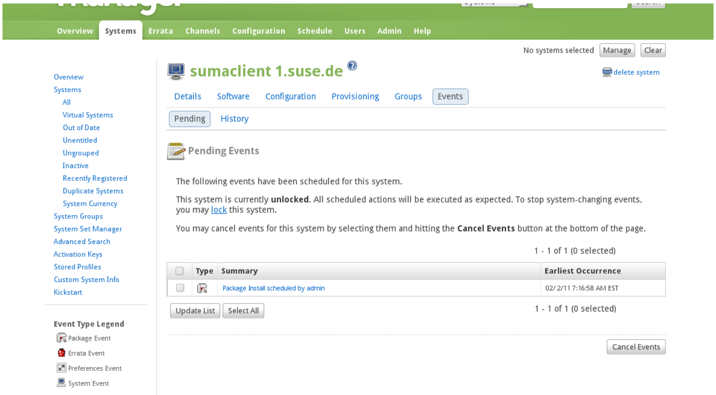
The finance organization administrator would type the following from a shell prompt:

```
migrate-system-profile --satellite satserver.example.com --systemId=10001020
 --to-org-id=2
```

The finance organization administrator is then prompted for their username and password (unless they specified it using `--username=` and `--password=` at the command-line).

The finance organization administrator would then be able to see the system from the *Systems* page when logged into the SUSE Manager web interface. The finance organization administrator can then finish the migration process by assigning a base channel and granting entitlements to the client as he would any other system registered with his organization, which is avaiable from the system's *History* page in the *Events* subtab.

Figure 5.6 *System History*



Pending Events

The following events have been scheduled for this system.

This system is currently **unlocked**. All scheduled actions will be executed as expected. To stop system-changing events, you may lock this system.

You may cancel events for this system by selecting them and hitting the **Cancel Events** button at the bottom of the page.

1 - 1 of 1 (0 selected)

□	Type	Summary	Earliest Occurrence
□		Package Install scheduled by admin	02/ 2/11 7:16:58 AM EST

1 - 1 of 1 (0 selected)

Event Type Legend
- Package Event
- Errata Event
- Preferences Event
- System Event

NOTE

The SUSE Manager administrator can migrate a system from one trusted organization to any other in the trust. However, organization administrators can only migrate a system from their own organization to another in the trust.

SUSE Manager administrators that need to migrate several systems at once can use the `--csv` option of `migrate-system-profile` to automate the process using a simple comma-separated list of systems to migrate.

A line in the CSV file should contain the ID of the system to be migrated as well as destination organization's ID in the following format:

```
systemId,to-org-id
```

the `systemId`, for example could be **1000010000**, while the `to-org-id` could be **4**. So, a compatible CSV could look like the following:

```
1000010000,3
1000010020,1
1000010010,4
```

For more information about using `migrate-system-profile` refer to the manual page by typing `man migrate-system-profile` or for a basic help screen type `migrate-system-profile -h`.

5.7 *Admin > Users*

The *Users Across SUSE Manager* page contains a list of all users on the SUSE Manager, throughout all organizations.

NOTE

You are only able to modify the details of organization users if you are logged in as that organization administrator.

Clicking the *Username* displays the *User Details* page. Refer to Section 3.9, “Users — [Mgmt]” (page 146) for more information on user configuration.

5.7.1 *Admin > Organizations > Details > Users*

The *Users* subtab lists the users assigned to the organization, including their real names, email address, and a check mark indicating that the user is an administrator of the organization.

If you are the organization administrator, you can click the username to display the *User Details* page for the user. For instructions regarding user management, refer to the section called “*User List* > *Active* > *User Details* — [Mgmt]” (page 147).

NOTE

You must be logged in as the organization administrator to edit the User details for an organization. The SUSE Manager administrator cannot edit user details for organization users.

Cobbler

6

SUSE Manager features the *Cobbler* server that allows administrators to centralize their system installation and provisioning infrastructure. Cobbler is an installation server that collects the various methods of performing unattended system installations, whether it be server, workstation, or guest systems in a full or para-virtualized setup.

Cobbler has several tools to assist in pre-installation guidance, automated installation file management, installation environment management, and more. Features of Cobbler include:

- Installation environment analysis using the `cobbler check` command
- Multi-site installation server configuration with `cobbler replicate`
- Virtual machine guest installation automation with the `koan` client-side tool.

6.1 Cobbler Requirements

To use Cobbler as a PXE boot server, you should check the following guidelines:

- If you plan to use Cobbler to install systems using PXE, you must have `tftp -server` installed and configured.
- If you plan to use Cobbler to PXE boot systems for installation, you must have either the ability to act as a DHCP server for Cobbler PXE booting or access to your network

DHCP server /etc/dhcp.conf to change next-server to the hostname or IP address of your Cobbler server.

6.1.1 Configuring Cobbler with /etc/cobbler/settings

Cobbler configuration is mainly done within the /etc/cobbler/settings file. The file contains several configurable settings, and offers detailed explanations for each setting regarding how it affects the functionality of Cobbler and whether it is recommended for users to change the setting for their environment.

Most of the settings can be left default and Cobbler will run as intended. For more information about configuring Cobbler settings, consult the /etc/cobbler/settings file, which documents each setting in detail.

6.1.2 Cobbler and DHCP

Cobbler supports bare-metal automated installation of systems configured to perform network boots using a PXE boot server. To properly implement a Cobbler installation server, administrators need to either have administrative access to the network's DHCP server or implement DHCP on the Cobbler server itself.

Configuring an Existing DHCP Server

If you have a DHCP server deployed on another system on the network, you will need administrative access to the DHCP server in order to to edit the DHCP configuration file so that it points to the Cobbler server and PXE boot image.

As root on the DHCP server, edit the /etc/dhcpd.conf file and append a new class with options for performing PXE boot installation. For example:

```
allow booting;
allow bootp;
class "PXE" {
match if substring(option vendor-class-identifier, 0, 9) = "PXEClient";
next-server 192.168.2.1;
filename "pxelinux.0";
}
```

Follow each action step-by-step in the above example:

1 Enable as administrator network booting with the `bootp` protocol.

2 Create as administrator a class called `PXE`. A system that is configured to have PXE first in its boot priority, identifies itself as `PXEClient`.

  You get the following results:

  - The DHCP server then directs the system to the Cobbler server at 192.168.2.1.
  - Finally, the DHCP server retrieves the `pxelinux.0` bootloader file.

6.1.3 Xinetd and TFTP

SUSE Manager uses the `atftpd` daemon, but it can also operated with Xinetd/TFTP. The `atftpd` is installed per default and the recommended method for providing PXE services. Usually you do not have to change its configuration, but if you have to, use the YaST Sysconfig Editor.

Xinetd is a daemon that manages a suite of services, including TFTP, the FTP server used for transferring the boot image to a PXE client.

To configure TFTP, you must first enable the service via Xinetd. To do this, edit the `/etc/xinetd.d/tftp` as root and change the `disable = yes` line to **`disable = no`**.

Before TFTP can start serving the `pxelinux.0` boot image, you must start the Xinetd service. Start YaST and use *System Services* > *Run Level* to configure the Xinetd daemon.

6.1.4 Syncing and Starting the Cobbler Service

Once all the prerequisites specified in `cobbler check` are configured to your needs, you can now start the Cobbler service.

Start the SUSE Manager server with the following command:

```
/usr/sbin/spacewalk-service start
```

WARNING

Do not start or stop the `cobblerd` service independent of the SUSE Manager service, as doing so may cause errors and other issues.

Always use `/usr/sbin/spacewalk-service` to start or stop SUSE Manager.

6.2 Adding a Distribution to Cobbler

If all Cobbler prerequisites have been met and Cobbler is now running, you can now begin adding a distribution to the Cobbler if you have the content on the Cobbler server.

For information about creating and configuring AutoYaST/Kickstart distributions from the SUSE Manager interface, refer to the section called "*Autoinstallation > Distributions* — [Prov]" (page 118).

Using `cobbler` to create a distribution from the command line is as follows:

```
cobbler distro add --name=string --kernel=path --initrd=path
```

The `--name=`*`string`* option is a label used to differentiate one distro choice from another (for example, **`sles11server`**)

The `--kernel=`*`path`* option specifies the path to the kernel image file

The `--initrd=`*`path`* option specifies the path to the initial ramdisk (initrd) image file.

6.3 Adding a Profile to Cobbler

Once you have configured a distribution to Cobbler, you can then add profiles to Cobbler.

Cobbler profiles associate a distribution to additional options, like AutoYaST/Kickstart files. Profiles are the core unit of provisioning and there must be at least one Cobbler profile for every distribution added. For example, two profiles might be created for a web server and a desktop configuration. While both profiles use the same distro, the profiles are for different installation types.

For information about creating and configuring Kickstart and AutoYaST profiles from the SUSE Manager interface, refer to the section called “Autoinstallation Profiles (Kickstart and AutoYaST)” (page 108).

The usage of `cobbler` to create profiles from the command line is as follows:

```
cobbler profile add --name=string --distro=string [--kickstart=url]
[--virt-file-size=gigabytes] [--virt-ram=megabytes]
```

The `--name=`*`string`* is the unique label for the profile, such as `sles11webserver` or `sles11workstation`.

The `--distro=`*`string`* option specifes the distribution that will be used for this particular profile. Distributions were added in Section 6.2, “Adding a Distribution to Cobbler” (page 206).

The `--kickstart=`*`url`* option specifies the location of the Kickstart file (if available).

The `--virt-file-size=`*`gigabytes`* option allows you to set the size of the virtual guest file image. The default is 5 gigabytes if left unspecified.

The `--virt-ram=`*`megabytes`* option specifies how many megabytes of physical RAM that a virtual guest system can consume. The default is 512 megabytes if left unspecified.

6.4 Adding a System to Cobbler

Once the distributions and profiles for Cobbler have been created, you can next add systems to Cobbler. System records map a piece of hardware on a client with the cobbler profile assigned to run on it.

NOTE

If you are provisioning via `koan` and PXE menus alone, it is not required to create system records, though they are useful when system-specific Kickstart templating is required or to establish that a specific system should always recieve a specific content installed. If there is a specific role inteded for a specified client, system records should be created for it.

For information about creating and configuring automated installation from the SUSE Manager interface, refer to the section called "*System Details* > *Provisioning* — [Prov]" (page 75).

The following command adds a system to the Cobbler configuration:

```
cobbler system add --name=string --profile=string --mac=AA:BB:CC:DD:EE:FF
```

The `--name=`*`string`* is the unique label for the system, such as **`engineeringserver`** or **`frontofficeworkstation`**.

The `--profile=`*`string`* specifies one of the profile names added in Section 6.3, "Adding a Profile to Cobbler" (page 206).

The `--mac=`*`AA:BB:CC:DD:EE:FF`* option allows systems with the specified MAC address to automatically be provisioned to the profile associated with the system record if they are being installed.

For more options, such as setting hostname or IP addresses, refer to the Cobbler manpage by typing `man cobbler` at a shell prompt.

6.5 Cobbler Templates

Within the SUSE Manager web interface, there are facilities to create variables for use with Kickstart distributions and profiles. For example, to create a Kickstart profile variable, refer to the section called "*Autoinstallation Details* > *Variables*" (page 112).

Kickstart variables are a part of an infrastructural change in SUSE Manager to support *templating* in Kickstart files. In the context of Kickstart files, templates are files that hold descriptions used to build actual Kickstart files, rather than creating specific kickstarts.

These templates are then shared by various profiles and systems that have their own variables and corresponding values. These variables modify the templates and software called a *template engine* parses the template and variable data into a usable Kickstart file. Cobbler uses an advanced template engine called *Cheetah* that provides support for templates, variables, and snippets.

Advantages of using templates include:

- Robust features that allow administrators to create and manage large amounts of profiles or systems without duplication of effort or manually creating Kickstarts for every unique situation
- While templates can become complex and involve loops, conditionals and other enhanced features and syntax, it can also be used simply to make Kickstart files without such complexity.

6.5.1 Using Templates

Kickstart templates can have static values for certain common items such as PXE image filenames, subnet addresses, and common paths such as `/etc/sysconfig/network-scripts/`. However, where templates differ from standard Kickstart files are in their use of variables.

For example, a standard Kickstart file may have a networking passage that looks similar to the following

```
network --device=eth0 --bootproto=static --ip=192.168.100.24
--netmask=255.255.255.0 --gateway=192.168.100.1 --nameserver=192.168.100.2
```

However, in a Kickstart template file, the networking passage may look similar to the following:

```
network --device=$net_dev --bootproto=static --ip=$ip_addr
--netmask=255.255.255.0 --gateway=$my_gateway --nameserver=$my_nameserver
```

These variables will be substituted with the values set in your Kickstart profile variables or in your system detail variables. If there are the same variables defined in both the profile and the system detail, then the system variable takes precedence.

For more information about Kickstart templates, refer to the Cobbler project page at the following URL:

https://fedorahosted.org/cobbler/wiki/KickstartTemplating

6.5.2 Kickstart Snippets

If you have common configurations that are the same across all Kickstart templates and profiles, you can utilize the *Snippets* feature of Cobbler to take advantage of code reuse.

Kickstart snippets are sections of Kickstart code that can be called by a `$SNIPPET()` function that will be parsed by Cobbler and substitute that function call with the contents of the snippet.

For example, if you had a common hard drive partition configuration for all servers, such as:

```
clearpart --all
part /boot --fstype ext3 --size=150 --asprimary
part / --fstype ext3 --size=40000 --asprimary
part swap --recommended

part pv.00 --size=1 --grow

volgroup vg00 pv.00
logvol /var --name=var vgname=vg00 --fstype ext3 --size=5000
```

You could take that snippet, save it to a file (such as `my_partition`), and place the file in `/var/lib/cobbler/snippets/` so that Cobbler can access them.

You can then use the snippet by using the `$SNIPPET()` function in your Kickstart templates. For example:

```
$SNIPPET('my_partition')
```

Wherever you invoke that function, the Cheetah parser will substitute the function with the snippet of code contained in the `my_partition` file.

For more information about Kickstart snippets, refer to the Cobbler project page at the following URL:

https://fedorahosted.org/cobbler/wiki/KickstartSnippets

6.6 Using Koan

Whether you are provisioning guests on a virtual machine or re-installing a new distribution on a running system, koan works in conjunction with Cobbler to provision systems on the fly.

6.6.1 Using Koan to Provision Virtual Systems

If you have created a virtual machine profile as documented in Section 6.3, “Adding a Profile to Cobbler” (page 206), you can use `koan` to initiate the installation of a virtual guest on a system.

For example, say you've created a Cobbler profile such as the following:

```
cobbler add profile --name=virtualfileserver --distro=sless11-x86_64-server
--virt-file-size=20 --virt-ram=1000
```

This profile is for a fileserver running SUSE Linux Enterprise Server 11 with a 20GB guest image size and alloted 1GB of system RAM.

To find the name of the virtual guest system profile, run the following with `koan`:

```
koan --server=hostname --list-profiles
```

This command lists all of the available profiles created with `cobbler profile add`.

Then, begin the process of creating the image file and starting the installation of the virtual guest system.

```
koan --virt --server=cobbler-server.example.com --profile=virtualfileserver
--virtname=marketingfileserver
```

The command specifies that a virtual guest system be created from the Cobbler server (hostname `cobbler-server.example.com`) using the **`virtualfileserver`** profile. The `virtname` option specifies a label for the virtual guest, which by default is labeled with the system's MAC address.

Once installation of the virtual guest is complete, it can be used as any other virtual guest system.

6.6.2 Using Koan to Re-install Running Systems

There may be instances where you need to re-install a machine with another operating system while it is still running. `koan` can help you by destructively replacing a running system with a new installation from the available Cobbler profiles.

To replace a running system and install a new one, run the following command *on the system itself*:

```
koan --replace-self --server=hostname --profile=name
```

This command, when executed on the running system to be replaced, will start the provisioning process and replace its own system using the profile in `--profile=name` on the Cobbler server specified in `--server=hostname`.

Command Line Config Management Tools

A

In addition to the options provided in the SUSE Manager website, SUSE Manager offers two command line tools for managing a system's configuration files: the Configuration Client and the Configuration Manager. There is a complementary Actions Control tool that is used to enable and disable configuration management on client systems. If you do not yet have these these tools installed, they can be found within the *SUSE Manager Tools* child channel for your operating system (package names are: `rhncfg-client`, `rhncfg-management`, and `rhncfg-actions`).

NOTE: Tip

Keep in mind, whenever a configuration file is deployed via SUSE Manager, a backup of the previous file including its full path is made in the `/var/lib/rhncfg/backups/` directory on the affected system. The backup retains its filename but has a `.rhn-cfg-backup` extension appended.

A.1 Actions Control

The Actions Control (`mgr-actions-control`) application is used to enable and disable configuration management of a system. Client systems cannot be managed in this fashion by default. This tool allows SUSE Manager Administrators to enable or disable specific modes of allowable actions such as: *deploying* a configuration file onto the system, *uploading* a file from the system, *diffing* what is currently managed on a system and what is available, or allowing running arbitrary *remote commands*. These various modes are enabled/disabled by placing/removing files and directories in the

/etc/sysconfig/rhn/allowed-actions/ directory. Due to the default permissions on the /etc/sysconfig/rhn/ directory, Actions Control will most likely have to be run by someone with root access.

A.1.1 General command line options

There is a man page available, as there are for most command line tools, though the use of this tool is simple enough to describe here briefly. Simply decide what scheduled actions should be enabled for use by system administrators. The following options enable the various scheduled action modes:

Table A.1 *mgr-actions-control options*

Option	Description
--enable-deploy	Allow mgrcfg-client to deploy files.
--enable-diff	Allow mgrcfg-client to diff files.
--enable-upload	Allow mgrcfg-client to upload files.
--enable-mtime-upload	Allow mgrcfg-client to upload mtime.
--enable-all	Allow mgrcfg-client to do everything.
--enable-run	Enable script run.
--disable-deploy	Disable deployment.
--disable-diff	Disable diff
--disable-upload	Disable upload
--disable-mtime-upload	Disable mtime upload
--disable-all	Disable all options
--disable-run	Disable script run.

Option	Description
--report	Report whether the modes are enabled or disabled.
-f, --force	Force the operation without asking first.
-h, --help	Show help message and exit.

Once a mode is set—and for many, `mgr-actions-control --enable-all` is common—your system is now ready for config management through SUSE Manager.

A.2 Configuration Client

As the name implies, the Configuration Client (`mgrcfg-client`) is installed and run from an individual client system. From there you may use it to gain knowledge about how SUSE Manager deploys configuration files to the client.

The Configuration Client offers these primary modes: list, get, channels, diff, and verify.

A.2.1 Listing Config Files

To list the configuration files for the machine and the labels of the config channels containing them, issue the command:

```
mgrcfg-client list
```

The output resembles the following list:

```
Config Channel File config-channel-17 /etc/example-config.txt config-channel-17
 /var/spool/aalib.rpm config-channel-14 /etc/rhn/rhn.conf
```

These are the configuration files that apply to your system. However, there may be duplicate files present in the other channels. For example, issue the following command:

```
mgrcfg-manager list config-channel-14
```

and observe the following output:

```
Files in config channel 'config-channel-14' /etc/example-config.txt
/etc/rhn/rhn.conf
```

You may then wonder where the second version of /etc/example-config.txt went. The rank of the /etc/example-config.txt file in config-channel-17 was higher than that of the same file in config-channel-14. As a result, the version of the configuration file in config-channel-14 is not deployed for this system, although the file still resides in the channel. The mgrcfg-client command does not list the file because it will not be deployed on this system.

A.2.2 Getting a Config File

To download the most relevant configuration file for the machine, issue the command:

```
mgrcfg-client get /etc/example-config.txt
```

You should see output resembling:

```
Deploying /etc/example-config.txt
```

You may then view the contents of the file with less or another pager. Note that the file is selected as the most relevant based upon the rank of the config channel containing it. This is accomplished within the *Configuration* tab of the *System Details* page. Refer to the section called “System Details” (page 61) for instructions.

A.2.3 Viewing Config Channels

To view the labels and names of the config channels that apply to the system, issue the command:

```
mgrcfg-client channels
```

You should see output resembling:

```
Config channels: Label Name ----- ---- config-channel-17 config chan 2
config-channel-14 config chan 1
```

The following table lists the options available for mgrcfg-client get:

***Table A.2** mgrcfg-client get options*

Option	Description
--topdir=TOPDIR	Make all file operations relative to this string.
-h, --help	Show help message and exit.

A.2.4 Differentiating between Config Files

To view the differences between the config files deployed on the system and those stored by SUSE Manager, issue the command:

```
mgrcfg-client diff
```

The output resembles the following:

```
--- /tmp/@3603.0.rhn-cfg-tmp 2004-01-13 14:18:31.000000000 -0500
+++ /etc/example-config.txt 2003-12-16 21:35:32.000000000 -0500
@@ -1,3 +1,5 @@
+additional text
```

In addition, you may include the `--topdir` option to compare config files with those located in an arbitrary (and unused) location on the client system, like so:

```
# mgrcfg-client diff --topdir /home/test/blah/
/usr/bin/diff: /home/test/blah/etc/example-config.txt: No such file or
directory
/usr/bin/diff: /home/test/blah/var/spool/aalib.rpm: No such file or directory
```

A.2.5 Verifying Config Files

To quickly determine if client configuration files are different than those associated with it via SUSE Manager, issue the command:

```
mgrcfg-client verify
```

The output resembles the following:

```
modified /etc/example-config.txt /var/spool/aalib.rpm
```

The file `example-config.txt` is locally modified, while `aalib.rpm` is not.

The following table lists the options available for `mgrcfg-client verify`:

***Table A.3** mgrcfg-client verify options*

Option	Description
-v, --verbose	Increase the amount of output detail. Displays differences in the mode, owner, and group permissions for the specified config file.
-h, --help	Show help message and exit.

A.3 Configuration Manager

Unlike the Configuration Client, the Configuration Manager (`mgrcfg-manager`) is designed to maintain SUSE Manager's central repository of config files and channels, not those located on client systems. This tool offers a command line alternative to the configuration management features within the SUSE Manager website, as well as the ability to script some or all of the related maintenance.

It is intended for use by Config Administrators and requires an SUSE Manager username and password that has the appropriate permission set. The username may be specified in `/etc/sysconfig/rhn/rhncfg-manager.conf` or in the [rhncfg-manager] section of `~/.rhncfgrc`.

When the Configuration Manager is run as root, it attempts to pull in needed configuration values from the Red Hat Update Agent. When run as a user other than root, you may have to make configuration changes within the `~/.rhncfgrc` file. The session file is cached in `~/.rhncfg-manager-session` to prevent logging in for every command.

The default timeout for the Configuration Manager is 30 minutes. To alter this, add the `server.session_lifetime` option and new value to the `/etc/rhn/rhn.conf` file on the server running the manager, like so:

```
server.session_lifetime = 120
```

The Configuration Manager offers these primary modes: add, create-channel, diff, diff-revisions, download-channel, get, list, list-channels, remove, remove-channel, revisions, update, and upload-channel.

Each mode offers its own set of options, which can be seen by issuing the following command:

```
mgrcfg-manager mode --help
```

Replace `mode` with the name of the mode to be inspected:

```
mgrcfg-manager diff-revisions --help
```

You can see such a list of options for the add mode at Table A.4, "`mgrcfg-manager add` options" (page 220).

A.3.1 Creating a Config Channel

To create a config channel for your organization, issue the command:

```
mgrcfg-manager create-channel channel-label
```

If prompted for your SUSE Manager username and password, provide them.

Once you have created a config channel, use the remaining modes listed above to populate and maintain that channel.

A.3.2 Adding Files to a Config Channel

To add a file to a config channel, specify the channel label as well as the local file to be uploaded, such as:

```
mgrcfg-manager add --channel=channel-label /path/to/file
```

In addition to the required channel label and the path to the file, you may use the available options for modifying the file during its addition. For instance, you may alter the path and file name by including the `--dest-file` option in the command, like:

```
mgrcfg-manager add --channel=channel-label--dest-file=/new/path/to/file.txt
/path/to/file
```

The output resembles the following:

```
Pushing to channel example-channel Local file >/path/to/file -> remote file
/new/path/to/file.txt
```

The following table lists the options available for `mgrcfg-manager add`:

Table A.4 *mgrcfg-manager add options*

Option	Description
-cCHANNEL --channel=CHANNEL	Upload files in this config channel
-dDEST_FILE --dest-file=DEST_FILE	Upload the file as this path
--delim-start=DELIM_START	Start delimiter for variable interpolation
--delim-end=DELIM_END	End delimiter for variable interpolation
-h, --help	show help message and exit

NOTE

By default, the maximum file size for confiugration files is 128KB. If you need to change that value, find or create the following line in the `/etc/rhn/rhn.conf` file:

```
web.maximum_config_file_size=128
```

Change the value from 128 to whatever limit you want in bytes.

A.3.3 Differentiating between Latest Config Files

To view the differences between the config files on disk and the latest revisions in a channel, issue the command:

```
mgrcfg-manager diff --channel=channel-label --dest-file=/path/to/file.txt \
/local/path/to/file
```

You should see output resembling:

```
/tmp/dest_path/example-config.txt /home/test/blah/hello_world.txt
--- /tmp/dest_path/example-config.txt config_channel: example-channel revision:
 1
+++ /home/test/blah/hello_world.txt 2003-12-14 19:08:59.000000000 -0500
@@ -1 +1 @@
-foo
+hello, world
```

The following table lists the options available for `mgrcfg-manager diff`:

Table A.5 *mgrcfg-manager diff options*

Option	Description
-cCHANNEL, --channel=CHANNEL	Get file(s) from this config channel
-rREVISION, --revision=REVISION	Use this revision
-dDEST_FILE, --dest-file=DEST_FILE	Upload the file as this path
-tTOPDIR, --topdir=TOPDIR	Make all files relative to this string
-h, --help	Show help message and exit

A.3.4 Differentiating between Various Versions

To compare different versions of a file across channels and revisions, use the `-r` flag to indicate which revision of the file should be compared and the `-n` flag to identify the two channels to be checked. Refer to Section A.3.11, “Determining the Number of File Revisions” (page 225) for related instructions. Specify only one file name here, since you are comparing the file against another version of itself. For example:

```
mgrcfg-manager diff-revisions
-n=channel-label1-r=1-n=channel-label2-r=1/path/to/file.txt
```

The output resembles the following:

```
--- /tmp/dest_path/example-config.txt 2004-01-13 14:36:41 \ config channel:
example-channel2 revision: 1
--- /tmp/dest_path/example-config.txt 2004-01-13 14:42:42 \ config channel:
```

```
example-channel3 revision: 1
@@ -1 +1,20 @@
-foo
+blaaaaaaaaaaaaaaah
+-----BEGIN PGP SIGNATURE-----
+Version: GnuPG v1.0.6 (GNU/Linux)
+Comment: For info see http://www.gnupg.org
+
+iD8DBQA9ZY6vse4XmfJPGwgRAsHcAJ9ud9dabUcdscdcqB8AZP7e0Fua0NmKsdhQCeOWHX
+VsDTfen2NWdwwPaTM+S+Cow=
+=Ltp2
+-----END PGP SIGNATURE-----
```

The following table lists the options available for `mgrcfg-manager diff-revisions`:

***Table A.6** mgrcfg-manager diff-revisions options*

Option	Description
-cCHANNEL, --channel=CHANNEL	Use this config channel
-rREVISION, --revision=REVISION	Use this revision
-h, --help	Show help message and exit

A.3.5 Downloading All Files in a Channel

To download all the files in a channel to disk, create a directory and issue the following command:

```
mgrcfg-manager download-channel channel-label --topdir .
```

The output resembles the following:

```
Copying /tmp/dest_path/example-config.txt -> \
blah2/tmp/dest_path/example-config.txt
```

The following table lists the options available for `mgrcfg-manager download-channel`:

Table A.7 *mgrcfg-manager download-channel options*

Option	Description
-tTOPDIR, --topdir=TOPDIR	Directory all the file paths are relative to. This option must be set.
-h, --help	Show help message and exit.

A.3.6 Getting the Contents of a File

To direct the contents of a particular file to stdout, issue the command:

```
mgrcfg-manager get --channel=channel-label \
/tmp/dest_path/example-config.txt
```

You should see the contents of the file as output.

A.3.7 Listing All Files in a Channel

To list all the files in a channel, issue the command:

```
mgrcfg-manager list channel-label
```

You should see output resembling:

```
Files in config channel `example-channel3': /tmp/dest_path/example-config.txt
```

The following table lists the options available for `mgrcfg-manager get`:

Table A.8 *mgrcfg-manager get options*

Option	Description
-cCHANNEL, --channel=CHANNEL	Get file(s) from this config channel
-tTOPDIR, --topdir=TOPDIR	Make all files relative to this string

Option	Description
-rREVISION, --revision=REVISION	Get this file revision
-h, --help	Show help message and exit

A.3.8 Listing All Config Channels

To list all of your organization's configuration channels, issue the command:

```
mgrcfg-manager list-channels
```

The output resembles the following:

```
Available config channels: example-channel example-channel2 example-channel3
 config-channel-14 config-channel-17
```

Note that this does not list `local_override` or `server_import` channels.

A.3.9 Removing a File from a Channel

To remove a file from a channel, issue the command:

```
mgrcfg-manager remove --channel=channel-label /tmp/dest_path/example-config.txt
```

If prompted for your SUSE Manager username and password, provide them.

The following table lists the options available for `mgrcfg-manager remove`:

Table A.9 *mgrcfg-manager remove options*

Option	Description
-cCHANNEL, --channel=CHANNEL	Remove files from this config channel
-tTOPDIR, --topdir=TOPDIR	Make all files relative to this string
-h, --help	Show help message and exit

A.3.10 Deleting a Config Channel

To destroy a config channel in your organization, issue the command:

```
mgrcfg-manager remove-channel channel-label
```

The output resembles the following:

```
Removing config channel example-channel Config channel example-channel removed
```

A.3.11 Determining the Number of File Revisions

To find out how many revisions (revisions go from 1 to N where N is an integer greater than 0) of a file/path are in a channel, issue the following command:

```
mgrcfg-manager revisions channel-label /tmp/dest_path/example-config.txt
```

The output resembles the following:

```
Analyzing files in config channel example-channel \
/tmp/dest_path/example-config.txt: 1
```

A.3.12 Updating a File in a Channel

To create a new revision of a file in a channel (or add the first revision to that channel if none existed before for the given path), issue the following command:

```
mgrcfg-manager update \
--channel=channel-label \
--dest-file=/path/to/file.txt /local/path/to/file
```

The output resembles the following:

```
Pushing to channel example-channel: Local file
example-channel/tmp/dest_path/example-config.txt -> \ remote file
/tmp/dest_path/example-config.txt
```

The following table lists the options available for `mgrcfg-manager update`:

Table A.10 mgrcfg-manager update options

Option	Description
-cCHANNEL, --channel=CHANNEL	Upload files in this config channel
-dDEST_FILE, --dest-file=DEST_FILE	Upload the file as this path
-tTOPDIR, --topdir=TOPDIR	Make all files relative to this string
--delim-start=DELIM_START	Start delimiter for variable interpolation
--delim-end=DELIM_END	End delimiter for variable interpolation
-h, --help	Show help message and exit

A.3.13 Uploading Multiple Files at Once

To upload multiple files to a config channel from local disk at once, issue the command:

```
mgrcfg-manager upload-channel --topdir=topdir channel-label
```

The output resembles the following:

```
Using config channel example-channel4 Uploading /tmp/ola_world.txt from
blah4/tmp/ola_world.txt
```

The following table lists the options available for `mgrcfg-manager upload-channel`:

Table A.11 mgrcfg-manager upload-channel options

Option	Description
-tTOPDIR, --topdir=TOPDIR	Directory all the file paths are relative to
-cCHANNEL, --channel=CHANNEL	List of channels the config info will be uploaded into. Channels delimited by ','. Example: --channel=foo,bar,baz

Option	Description
-h, --help	Show help message and exit

B

SUSE Manager API Access

In an effort to provide customers with added flexibility, SUSE Manager makes an application programming interface (API) available. This interface can be found by clicking *Help* at the top-right corner of the SUSE Manager website, then clicking *API* in the left navigation bar.

The SUSE Manager API is based upon XML-RPC, which allows distinct pieces of software on disparate systems to make remote procedure calls using XML over HTTP. For this reason, any calls you make are expected to meet the constraints of XML-RPC. You can find out more at `http://www.xmlrpc.com/`.

This section bypasses a list of available methods and classes in favor of tips for using the API efficiently. These include steps for determining required values and a sample script that makes some of the calls.

B.1 Using the auth Class and Getting the Session

It is worth noting that you will almost invariably use the auth class first. This class offers a single method, login. Use this to establish an SUSE Manager session. It requires values for three parameters: username, password, and duration. The first two come directly from your SUSE Manager account, while the third is the length of time the session should last in seconds, typically 1200. It returns a session string than can be used in all other methods.

B.2 Obtaining the system_id

Many of the methods require a value for the system_id parameter. This is the unique alphanumeric value assigned to each system when registered to SUSE Manager. It can be found within the /etc/sysconfig/rhn/systemid file on each machine. In addition, you may use the download_system_id method within the system class to obtain the value.

B.3 Determining the sid

Several methods require a value for the sid, or server ID, parameter. Note that this is different from the system_id. You may determine the sid of a machine in two different ways. First, you can log into the SUSE Manager website, click the name of a system, and view the sid at the end of the URL in the location bar. It follows the = symbol and is part of a string that resembles the following: index.pxt?sid=1003486534 . Second, you may use the list_user_systems method within the system class to obtain a list of systems available to the user that contains the associated sids.

B.4 Viewing the cid

Like servers, channels have their own IDs. This value, the cid, is a required parameter for some methods, including set_base_channel and set_child_channels. Also like the sid, the cid can be obtained through the SUSE Manager website. Just click on the name of a channel and view the end of the URL. It follows the = symbol, as part of a string that resembles the following: details.pxt?cid=54 .

B.5 Getting the sgid

System groups also have their own IDs. This value, the sgid, is a required parameter for the set_group_membership method, for instance. Like the sid and cid, the sgid can be obtained through the SUSE Manager website. Just click on the name of a system group and view the end of the URL. It follows the = symbol, as part of a string that resembles the following: `details.pxt?sgid=334958`. Note that the member parameter within the `set_group_membership` method requires only `yes` or `no` as input to make the association.

B.6 Channel Labels

The architecture of a channel is not always clear from the channel label. Below is a list that shows the correspondence between channel labels and the official title of the architecture they serve.

Table B.1 *Channel Labels*

Channel Label	Platform
channel-i386-sun-solaris	i386 Solaris
channel-ia32	IA-32
channel-ia64	IA-64
channel-sparc	Sparc
channel-alpha	Alpha
channel-s390	IBM S/390
channel-s390x	IBM System z
channel-iSeries	IBM eServer System i
channel-pSeries	IBM eServer System p
channel-x86_64	AMD64 and Intel EM64T
channel-ppc	PPC
channel-sparc-sun-solaris	Sparc Solaris

This is particularly necessary to know for the channel.software.create method.

B.7 Sample API Script

The following sample script depicts how to construct an SUSE Manager API client. Review the comments and links for a full discussion of the calls made.

```
#!/usr/bin/perl -w

use strict;
use Frontier::Client;
use Data::Dumper;

############################################################################
# This is a sample script for use of the experimental Management APIs.     #
# The API is currently available using XMLRPC only, which is described in  #
# depth at:                                                                #
#                                                                          #
# http://www.xmlrpc.com/                                                   #
#                                                                          #
# We use the Frontier modules, available from:                             #
#                                                                          #
# http://theoryx5.uwinnipeg.ca/mod_perl/cpan-search?dist=Frontier-RPC      #
#                                                                          #
############################################################################


############################################################################
#   Defining an XMLRPC session.                                            #
############################################################################

# Define the host first.  This will be the FQDN of your SUSE Manager system.
my $HOST = '.yourdomain.com';

# Now we create the client object that will be used throughout the session.

my $client = new Frontier::Client(url => "http://$HOST/rpc/api");

# Next, we execute a login call, which returns a session identifier that will
# be passed in all subsequent calls.  The syntax of this call is described
at:
#
#   http://$HOST/rpc/api/auth/login/

my $session = $client->call('auth.login', 'username', 'password');

############################################################################
#   System calls.                                                          #
############################################################################
```

```
# This next call returns a list of systems available to the user.  The
# syntax of this call is described at:
#
#   http://$HOST/rpc/api/system/list_user_systems/
#
# In the code snippet below, we dump data about our systems, and we
# capture the ID of the first system we find for future operations.

my $systems = $client->call('system.list_user_systems', $session);
for my $system (@$systems) {
  print Dumper($system);
}
print "\n\nCapturing ID of system @$systems[0]->{name}\n\n";
my $systemid = @$systems[0]->{id};

# This next call returns a list of packages present on this system.  The
# syntax of this call is described at:
#
#   http://$HOST/rpc/api/system/list_packages/
#
# This will probably be a pretty long list.

my $packages = $client->call('system.list_packages', $session, $systemid);
for my $package (@$packages) {
  print Dumper($package);
}

# Additional system calls are described at:
#   http://$HOST/rpc/api/system/
```

C Probes

As described in Section 3.10, “Monitoring — [Mon]” (page 153), monitoring-entitled systems can have probes applied to them that constantly confirm their health and full operability. This appendix lists the available probes broken down by command group, such as Apache.

Many probes that monitor internal system aspects (such as the Linux::Disk Usage probe) rather than external aspects (such as the Network Services::SSH probe) require the installation of the SUSE Manager monitoring daemon (`rhnmd`). This requirement is noted within the individual probe reference.

Each probe has its own reference in this appendix that identifies required fields (marked with *), default values, and the thresholds that may be set to trigger alerts. Similarly, the beginning of each command group's section contains information applicable to all probes in that group. Section C.1, “Probe Guidelines” (page 236) covers general guidelines; the remaining sections examine individual probes.

NOTE

Nearly all of the probes use *Transmission Control Protocol* (TCP) as their transport protocol. Exceptions to this are noted within the individual probe references.

C.1 Probe Guidelines

The following general guidelines outline the meaning of each probe state, and provide guidance in setting thresholds for your probes.

The following list provides a brief description of the meaning of each probe state:

Unknown
: The probes that cannot collect the metrics needed to determine probe state. Most (though not all) probes enter this state when exceeding their timeout period. Probes in this state may be configured incorrectly, as well.

Pending
: The probes whose data has not been received by SUSE Manager. It is normal for new probes to be in this state. However, if all probes move into this state, your monitoring infrastructure may be failing.

OK
: The probes that have run successfully without error. This is the desired state for all probes.

Warning
: The probes that have crossed their WARNING thresholds.

Critical
: The probes that have crossed their CRITICAL thresholds or reached a critical status by some other means. (Some probes become critical when exceeding their timeout period.)

While adding probes, select meaningful thresholds that, when crossed, notify you and your administrators of problems within your infrastructure. Timeout periods are entered in seconds unless otherwise indicated. Exceptions to these rules are noted within the individual probe references.

IMPORTANT

Some probes have thresholds based on time. In order for such CRITICAL and WARNING thresholds to work as intended, their values cannot exceed the amount of time allotted to the timeout period. Otherwise, an UNKNOWN status is returned in all instances of extended latency, thereby nullifying the thresholds.

For this reason, it is strongly recommended to ensure that timeout periods exceed all timed thresholds.

Remember it is recommended to run your probes without notifications for a time to establish baseline performance for each of your systems. Although the default values provided for probes may suit your needs, every organization has a different environment that may require altering thresholds.

C.2 Apache 1.3.x and 2.0.x

The probes in this section may be applied to instances of the Apache Web server. Although the default values presume you will apply these probes using standard HTTP, you may also use them over secure connections by changing the application protocol to **https** and the port to **443**.

C.2.1 Apache::Processes

The Apache::Processes probe monitors the processes executed on an Apache Web server and collects the following metrics:

- Data Transferred Per Child — Records data transfer information only on individual children. A child process is one that is created from the parent process or another process.

- Data Transferred Per Slot — The cumulative amount of data transferred by a child process that restarts. The number of slots is configured in the `httpd.conf` file using the `MaxRequestsPerChild` setting.

The `ExtendedStatus` directive in the `httpd.conf` file of the Web server must be set to **On** for this probe to function properly.

Table C.1 *Apache::Processes settings*

Field	Value
Application Protocol*	http

Field	Value
Port*	80
Pathname*	/server-status
UserAgent*	NOCpulse-ApacheUptime/1.0
Username	
Password	
Timeout*	15
Critical Maximum Megabytes Transferred Per Child	
Warning Maximum Megabytes Transferred Per Child	
Critical Maximum Megabytes Transferred Per Slot	
Warning Maximum Megabytes Transferred Per Slot	

C.2.2 Apache::Traffic

The Apache::Traffic probe monitors the requests on an Apache Web server and collects the following metrics:

- Current Requests — The number of requests being processed by the server at probe runtime.

- Request Rate — The accesses to the server per second since the probe last ran.

- Traffic — The kilobytes per second of traffic the server has processed since the probe last ran.

The `ExtendedStatus` directive in the `httpd.conf` file of the Web server must be set to **`On`** for this probe to function properly.

Table C.2 *Apache::Traffic settings*

Field	Value
Application Protocol*	http
Port*	80
Pathname*	/server-status
UserAgent*	NOCpulse-ApacheUptime/1.0
Username	
Password	
Timeout*	15
Critical Maximum Current Requests (number)	
Warning Maximum Current Requests (number)	
Critical Maximum Request Rate (events per second)	
Warning Maximum Request Rate (events per second)	
Critical Maximum Traffic (kilobytes per second)	
Warning Maximum Traffic (kilobytes per second)	

C.2.3 Apache::Uptime

The Apache::Uptime probe stores the cumulative time since the Web server was last started. No metrics are collected by this probe, which is designed to help track service level agreements (SLAs).

Table C.3 *Apache::Uptime settings*

Field	Value
Application Protocol*	http
Port*	80
Pathname*	/server-status
UserAgent*	NOCpulse-ApacheUptime/1.0
Username	
Password	
Timeout*	15

C.3 BEA WebLogic 6.x and higher

The probes in this section (with the exception of JDBC Connection Pool) can be configured to monitor the properties of any BEA WebLogic 6.x and higher server (administration or managed) running on a given host, even in a clustered environment. Monitoring of a cluster is achieved by sending all SNMP queries to the administration server of the domain and then querying its Managed Servers for individual data.

In order to obtain this higher level of granularity, the *BEA Domain Admin Server* parameter must be used to differentiate between the administration server receiving SNMP queries and the Managed Server undergoing the specified probe. If the host to be probed is the Administration Server, then the *BEA Domain Admin Server* parameter can be left blank, and both the SNMP queries and the probe will be sent to it only.

If the host to be probed is a managed server, then the IP address of the administration server should be provided in the *BEA Domain Admin Server* parameter, and the managed server name should be included in the *BEA Server Name* parameter and appended to the end of the *SNMP Community String* field. This causes the SNMP queries to be sent to the administration server host, as is required, but redirects the specific probe to the managed server host.

It should also be noted that the community string needed for probes run against managed server hosts should be in the form of **`community_prefix@managed_server_name`** in order for the SNMP query to return results for the desired managed server. Finally, SNMP must be enabled on each monitored system. SNMP support can be enabled and configured through the WebLogic console.

Please see the documentation that came with your BEA server or information on the BEA website for more details about BEA's community string naming conventions: `http://e-docs.bea.com/wls/docs70/snmpman/snmpagent.html`

C.3.1 BEA WebLogic::Execute Queue

The BEA WebLogic::Execute queue probe monitors the WebLogic execute queue and provides the following metrics:

- Idle Execute Threads — The number of execution threads in an idle state.
- Queue Length — The number of requests in the queue.
- Request Rate — The number of requests per second.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.4 *BEA WebLogic::Execute Queue settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	1
BEA Domain Admin Server	
BEA Server Name*	myserver
Queue Name*	default

Field	Value
Critical Maximum Idle Execute Threads	
Warning Maximum Idle Execute Threads	
Critical Maximum Queue Length	
Warning Maximum Queue Length	
Critical Maximum Request Rate	
Warning Maximum Request Rate	

C.3.2 BEA WebLogic::Heap Free

The BEA WebLogic::Heap Free probe collects the following metric:

- Heap Free — The percentage of free heap space.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.5 *BEA WebLogic::Heap Free settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	1
BEA Domain Admin Server	
BEA Server Name*	myserver
Critical Maximum Heap Free	

Field	Value
Warning Maximum Heap Free	
Warning Minimum Heap Free	
Critical Minimum Heap Free	

C.3.3 BEA WebLogic::JDBC Connection Pool

The BEA WebLogic::JDBC Connection Pool probe monitors the Java Database Connection (JDBC) pool on a domain admin server only (no managed servers) and collects the following metrics:

- Connections — The number of connections to the JDBC.
- Connections Rate — The speed at which connections are made to the JDBC, measured in connections per second.
- Waiters — The number of sessions waiting to connect to the JDBC.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.6 *BEA WebLogic::JDBC Connection Pool settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	1
BEA Domain Admin Server	
BEA Server Name*	myserver

Field	Value
JDBC Pool Name*	MyJDBC Connection Pool
Critical Maximum Connections	
Warning Maximum Connections	
Critical Maximum Connection Rate	
Warning Maximum Connection Rate	
Critical Maximum Waiters	
Warning Maximum Waiters	

C.3.4 BEA WebLogic::Server State

The BEA WebLogic::Server state probe monitors the current state of a BEA Weblogic Web server. If the probe is unable to make a connection to the server, a CRITICAL status results.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.7 *BEA WebLogic::Server State settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	1
BEA Domain Admin Server	
BEA Server Name*	

C.3.5 BEA WebLogic::Servlet

The BEA WebLogic::Servlet probe monitors the performance of a particular servlet deployed on a WebLogic server and collects the following metrics:

- High Execution Time — The highest amount of time in milliseconds that the servlet takes to execute since the system was started.
- Low Execution Time — The lowest amount of time in milliseconds that the servlet takes to execute since the system was started.
- Execution Time Moving Average — A moving average of the execution time.
- Execution Time Average — A standard average of the execution time.
- Reload Rate — The number of times the specified servlet is reloaded per minute.
- Invocation Rate — The number of times the specified servlet is invoked per minute.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.8 *BEA WebLogic::Servlet settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	1
BEA Domain Admin Server	
BEA Server Name*	myserver
Servlet Name*	
Critical Maximum High Execution Time	
Warning Maximum High Execution Time	

Field	Value
Critical Maximum Execution Time Moving Average	
Warning Maximum Execution Time Moving Average	

C.4 General

The probes in this section are designed to monitor basic aspects of your systems. When applying them, ensure their timed thresholds do not exceed the amount of time allotted to the timeout period. Otherwise, the probe returns an UNKOWN status in all instances of extended latency, thereby nullifying the thresholds.

C.4.1 General::Remote Program

The General::Remote Program probe allows you to run any command or script on your system and obtain a status string. Note that the resulting message will be limited to 1024 bytes.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.9 *General::Remote Program settings*

Field	Value
Command*	
OK Exit Status*	0
Warning Exit Status*	1
Critical Exit Status*	2
Timeout	15

C.4.2 General::Remote Program with Data

The General::Remote Program with Data probe allows you to run any command or script on your system and obtain a value, as well as a status string. To use this probe, you must include XML code in the body of your script. This probe supports the following XML tags:

- `<perldata> </perldata>`
- `<hash> </hash>`
- `<hash key="..."> </hash>`

The remote program will need to output some iteration of the following code to `STDOUT`:

```
<perldata>
  <hash>
    <item key="data">10</item>
    <item key="status_message">status message here</item>
  </hash>
</perldata>
```

The required value for `data` is the data point to be inserted in the database for time-series trending. The `status_message` is optional and can be whatever text string is desired with a maximum length of 1024 bytes. Remote programs that do not include a `status_message` still report the value and status returned.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe. XML is case-sensitive. The `data` item key name cannot be changed and it must collect a number as its value.

Table C.10 *General::Remote Program with Data settings*

Field	Value
Command*	
OK Exit Status*	0
Warning Exit Status*	1

Field	Value
Critical Exit Status*	2
Timeout	15

C.4.3 General::SNMP Check

The General::SNMP Check probe tests your SNMP server by specifying a single object identifier (OID) in dotted notation (such as `1.3.6.1.2.1.1.1.0`) and a threshold associated with the return value. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the SNMP server to answer a connection request.

Requirements — SNMP must be running on the monitored system to perform this probe. Only integers can be used for the threshold values.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.11 *General::SNMP Check settings*

Field	Value
SNMP OID*	
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	2
Timeout*	15
Critical Maximum Value	
Warning Maximum Value	

Field	Value
Warning Minimum Value	
Critical Minimum Value	

C.4.4 General::TCP Check

The General::TCP Check probe tests your TCP server by verifying that it can connect to a system via the specified port number. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the TCP server to answer a connection request.

The probe passes the string specified in the *Send* field upon making a connection. The probe anticipates a response from the system, which should include the substring specified in the *Expect* field. If the expected string is not found, the probe returns a CRITICAL status.

Table C.12 *General::TCP Check settings*

Field	Value
Send	
Expect	
Port*	1
Timeout*	10
Critical Maximum Latency	
Warning Maximum Latency	

C.4.5 General::UDP Check

The General::UDP Check probe tests your UDP server by verifying that it can connect to a system via the specified port number. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the UDP server to answer a connection request.

The probe passes the string specified in the *Send* field upon making a connection. The probe anticipates a response from the system, which should include the substring specified in the *Expect* field. If the expected string is not found, the probe returns a CRITICAL status.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.13 *General::UDP Check settings*

Field	Value
Port*	1
Send	
Expect	
Timeout*	10
Critical Maximum Latency	
Warning Maximum Latency	

C.4.6 General::Uptime (SNMP)

The General::Uptime (SNMP) probe records the time since the device was last started. It uses the SNMP object identifier (OID) to obtain this value. The only error status it will return is UNKNOWN.

Requirements — SNMP must be running on the monitored system and access to the OID must be enabled to perform this probe.

This probe's transport protocol is User Datagram Protocol (UDP).

Table C.14 *General::Uptime (SNMP) settings*

Field	Value
SNMP Community String*	public
SNMP Port*	161
SNMP Version*	2
Timeout*	15

C.5 Linux

The probes in this section monitor essential aspects of your Linux systems, from CPU usage to virtual memory. Apply them to mission-critical systems to obtain warnings prior to failure.

Unlike other probe groups, which may or may not require the SUSE Manager monitoring daemon, every Linux probe requires that the `rhnmd` daemon be running on the monitored system.

C.5.1 Linux::CPU Usage

The Linux::CPU Usage probe monitors the CPU utilization on a system and collects the following metric:

- CPU Percent Used — The five-second average of the percent of CPU usage at probe execution.

Requirements — The SUSE Manager Monitoring Daemon must be running on the monitored system to run this probe.

Table C.15 Linux::CPU Usage settings

Field	Value
Timeout*	15
Critical Maximum CPU Percent Used	
Warning Maximum CPU Percent Used	

C.5.2 Linux::Disk IO Throughput

The Linux::Disk IO Throughput probe monitors a given disk and collects the following metric:

- Read Rate — The amount of data that is read in kilobytes per second.
- Write Rate — The amount of data that is written in kilobytes per second.

To obtain the value for the required *Disk number or disk name* field, run `iostat` on the system to be monitored and see what name has been assigned to the disk you desire. The default value of **0** usually provides statistics from the first hard drive connected directly to the system.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe. Also, the *Disk number or disk name* parameter must match the format visible when the `iostat` command is run. If the format is not identical, the configured probe enters an UNKNOWN state.

Table C.16 Linux::Disk IO Throughput settings

Field	Value
Disk number or disk name*	0
Timeout*	15
Critical Maximum KB read/second	

Field	Value
Warning Maximum KB read/second	
Warning Minimum KB read/second	
Critical Minimum KB read/second	
Critical Maximum KB written/second	
Warning Maximum KB written/second	
Warning Minimum KB written/second	
Critical Minimum KB written/second	

C.5.3 Linux::Disk Usage

The Linux::Disk Usage probe monitors the disk space on a specific file system and collects the following metrics:

- File System Used — The percentage of the file system currently in use.
- Space Used — The amount of the file system in megabytes currently in use.
- Space Available — The amount of the file system in megabytes currently available.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.17 *Linux::Disk Usage settings*

Field	Value
File system*	/dev/hda1
Timeout*	15

Field	Value
Critical Maximum File System Percent Used	
Warning Maximum File System Percent Used	
Critical Maximum Space Used	
Warning Maximum Space Used	
Warning Minimum Space Available	
Critical Minimum Space Available	

C.5.4 Linux::Inodes

The Linux::Inodes probe monitors the specified file system and collects the following metric:

- Inodes — The percentage of inodes currently in use.

An inode is a data structure that holds information about files in a Linux file system. There is an inode for each file, and a file is uniquely identified by the file system on which it resides and its inode number on that system.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be runnig on the monitored system to execute this probe.

Table C.18 *Linux::Inodes settings*

Field	Value
File system*	/
Timeout*	15
Critical Maximum Inodes Percent Used	

Field	Value
Warning Maximum Inodes Percent Used	

C.5.5 Linux::Interface Traffic

The Linux::Interface Traffic probe measures the amount of traffic into and out of the specified interface (such as eth0) and collects the following metrics:

- Input Rate — The traffic in bytes per second going into the specified interface.

- Output Rate — The traffic in bytes per second going out of the specified interface.

Requirements — The SUSE Manager monitoring daemon must be running on the monitored system to execute this probe.

Table C.19 *Linux::Interface Traffic settings*

Field	Value
Interface*	
Timeout*	30
Critical Maximum Input Rate	
Warning Maximum Input Rate	
Warning Minimum Input Rate	
Critical Minimum Input Rate	
Critical Maximum Output Rate	
Warning Maximum Output Rate	
Warning Minimum Output Rate	

Field	Value
Critical Minimum Output Rate	

C.5.6 Linux::Load

The Linux::Load probe monitors the CPU of a system and collects the following metric:

- Load — The average load on the system CPU over various periods.

Requirements — The SUSE Manager monitoring daemon must be running on the monitored system to execute this probe.

Table C.20 *Linux::Load settings*

Field	Value
Timeout*	15
Critical CPU Load 1-minute average	
Warning CPU Load 1-minute average	
Critical CPU Load 5-minute average	
Warning CPU Load 5-minute average	
Critical CPU Load 15-minute average	
Warning CPU Load 15-minute average	

C.5.7 Linux::Memory Usage

The Linux::Memory Usage probe monitors the memory on a system and collects the following metric:

- RAM Free — The amount of free random access memory (RAM) in megabytes on a system.

You can also include the reclaimable memory in this metric by entering **`yes`** or **`no`** in the *Include reclaimable memory* field.

Requirements — The SUSE Manager Monitoring Daemon must be running on the monitored system to execute this probe.

Table C.21 *Linux::Memory Usage settings*

Field	Value
Include reclaimable memory	no
Timeout*	15
Warning Maximum RAM Free	
Critical Maximum RAM Free	

C.5.8 Linux::Process Counts by State

The Linux::Process Counts by State probe identifies the number of processes in the following states:

- Blocked — A process that has been switched to the waiting queue and whose state has been switched to `waiting`.

- Defunct — A process that has terminated (either because it has been killed by a signal or because it has called `exit()`) and whose parent process has not yet received notification of its termination by executing some form of the `wait()` system call.

- Stopped — A process that has been stopped before its execution could be completed.

- Sleeping — A process that is in the `Interruptible` sleep state and that can later be reintroduced into memory, resuming execution where it left off.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

***Table C.22** Linux::Process Counts by State settings*

Field	Value
Timeout*	15
Critical Maximum Blocked Processes	
Warning Maximum Blocked Processes	
Critical Maximum Defunct Processes	
Warning Maximum Defunct Processes	
Critical Maximum Stopped Processes	
Warning Maximum Stopped Processes	
Critical Maximum Sleeping Processes	
Warning Maximum Sleeping Processes	
Critical Maximum Child Processes	
Warning Maximum Child Processes	

C.5.9 Linux::Process Count Total

The Linux::Process Count Total probe monitors a system and collects the following metric:

- Process Count — The total number of processes currently running on the system.

Requirements — The SUSE Manager monitoring daemon must be running on the monitored system to execute this probe.

Table C.23 Linux::Process Count Total settings

Field	Value
Timeout*	15
Critical Maximum Process Count	
Warning Maximum Process Count	

C.5.10 Linux::Process Health

The Linux::Process Health probe monitors user-specified processes and collects the following metrics:

- CPU Usage — The CPU usage rate for a given process in milliseconds per second. This metric reports the `time` column of `ps` output, which is the cumulative CPU time used by the process. This makes the metric independent of probe interval, allows sane thresholds to be set, and generates usable graphs (i.e. a sudden spike in CPU usage shows up as a spike in the graph).

- Child Process Groups — The number of child processes spawned from the specified parent process. A child process inherits most of its attributes, such as open files, from its parent.

- Threads — The number of running threads for a given process. A thread is the basic unit of CPU utilization, and consists of a program counter, a register set, and a stack space. A thread is also called a lightweight process.

- Physical Memory Used — The amount of physical memory (or RAM) in kilobytes used by the specified process.

- Virtual Memory Used — The amount of virtual memory in kilobytes used by the specified process, or the size of the process in real memory plus swap.

Specify the process by its command name or process ID. (PID). Entering a PID overrides the entry of a command name. If no command name or PID is entered, the error `Command not found` is displayed and the probe will be set to a CRITICAL state.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.24 *Linux::Process Health settings*

Field	Value
Command Name	
Process ID (PID) file	
Timeout*	15
Critical Maximum CPU Usage	
Warning Maximum CPU Usage	
Critical Maximum Child Process Groups	
Warning Maximum Child Process Groups	
Critical Maximum Threads	
Warning Maximum Threads	
Critical Maximum Physical Memory Used	
Warning Maximum Physical Memory Used	
Critical Maximum Virtual Memory Used	
Warning Maximum Virtual Memory Used	

C.5.11 Linux::Process Running

The Linux::Process running probe verifies that the specified process is functioning properly. It counts either processes or process groups, depending on whether the *Count process groups* checkbox is selected.

By default, the checkbox is selected, thereby indicating that the probe should count the number of process group leaders independent of the number of children. This allows you, for example, to verify that two instances of the Apache Web server are running regardless of the (dynamic) number of child processes. If it is not selected, the probe conducts a straightforward count of the number of processes (children and leaders) matching the specified process.

Specify the process by its command name or process ID. (PID). Entering a PID overrides the entry of a command name. If no command name or PID is entered, the error `Command not found` is displayed and the probe enters a CRITICAL state.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.25 *Linux::Process Running settings*

Field	Value
Command name	
PID file	
Count process groups	(checked)
Timeout*	15
Critical Maximum Number Running	
Critical Minimum Number Running	

C.5.12 Linux::Swap Usage

The Linux::Swap Usage probe monitors the swap partitions running on a system and reports the following metric:

- Swap Free — The percent of swap memory currently free.

Requirements — The SUSE Manager Monitoring Daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.26 Linux::Swap Usage settings

Field	Value
Timeout*	15
Warning Minimum Swap Free	
Critical Minimum Swap Free	

C.5.13 Linux::TCP Connections by State

The Linux::TCP Connections by State probe identifies the total number of TCP connections, as well as the quantity of each in the following states:

- TIME_WAIT — The socket is waiting after close for remote shutdown transmission so it may handle packets still in the network.
- CLOSE_WAIT — The remote side has been shut down and is now waiting for the socket to close.
- FIN_WAIT — The socket is closed, and the connection is now shutting down.
- ESTABLISHED — The socket has a connection established.
- SYN_RCVD — The connection request has been received from the network.

This probe can be helpful in finding and isolating network traffic to specific IP addresses or examining network connections into the monitored system.

The filter parameters for the probe let you narrow the probe's scope. This probe uses the `netstat -ant` command to retrieve data. The *Local IP address* and *Local port* parameters use values in the *Local Address* column of the output; the *Remote IP address* and *Remote port* parameters use values in the *Foreign Address* column of the output for reporting.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.27 *Linux::TCP Connections by State settings*

Field	Value
Local IP address filter pattern list	
Local port number filter	
Remote IP address filter pattern list	
Remote port number filter	
Timeout*	15
Critical Maximum Total Connections	
Warning Maximum Total Connections	
Critical Maximum TIME_WAIT Connections	
Warning Maximum TIME_WAIT Connections	
Critical Maximum CLOSE_WAIT Connections	
Warning Maximum CLOSE_WAIT Connections	
Critical Maximum FIN_WAIT Connections	
Warning Maximum FIN_WAIT Connections	
Critical Maximum ESTABLISHED Connections	
Warning Maximum ESTABLISHED Connections	
Critical Maximum SYN_RCVD Connections	
Warning Maximum SYN_RCVD Connections	

C.5.14 Linux::Users

The Linux::Users probe monitors the users of a system and reports the following metric:

- Users — The number of users currently logged in.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.28 *Linux::Users settings*

Field	Value
Timeout*	15
Critical Maximum Users	
Warning Maximum Users	

C.5.15 Linux::Virtual Memory

The Linux::Virtual Memory probe monitors the total system memory and collects the following metric:

- Virtual Memory — The percent of total system memory - random access memory (RAM) plus swap - that is free.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.29 *Linux::Virtual Memory settings*

Field	Value
Timeout*	15
Warning Minimum Virtual Memory Free	

Field	Value
Critical Minimum Virtual Memory Free	

C.6 LogAgent

The probes in this section monitor the log files on your systems. You can use them to query logs for certain expressions and track the sizes of files. For LogAgent probes to run, the **`nocpulse`** user must be granted read access to your log files.

Note that data from the first run of these probes is not measured against the thresholds to prevent spurious notifications caused by incomplete metric data. Measurements will begin on the second run.

C.6.1 LogAgent::Log Pattern Match

The LogAgent::Log Pattern match probe uses regular expressions to match text located within the monitored log file and collects the following metrics:

- Regular Expression Matches — The number of matches that have occurred since the probe last ran.

- Regular Expression Match Rate — The number of matches per minute since the probe last ran.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe. For this probe to run, the **`nocpulse`** user must be granted read access to your log files.

In addition to the name and location of the log file to be monitored, you must provide a regular expression to be matched against. The expression must be formatted for `egrep`, which is equivalent to `grep -E` and supports extended regular expressions. This is the regular expression set for `egrep`:

```
^ beginning of line
$ end of line
. match one char
* match zero or more chars
```

```
[] match one character set, e.g. '[Ff]oo'
[^] match not in set '[^A-F]oo'
+ match one or more of preceding chars
? match zero or one of preceding chars
| or, e.g. a|b
() groups chars, e.g., (foo|bar) or (foo)+
```

WARNING

Do not include single quotation marks (') within the expression. Doing so causes `egrep` to fail silently and the probe to time out.

Table C.30 *LogAgent::Log Pattern Match settings*

Field	Value
Log file*	/var/log/messages
Basic regular expression*	
Timeout*	45
Critical Maximum Matches	
Warning Maximum Matches	
Warning Minimum Matches	
Critical Minimum Matches	
Critical Maximum Match Rate	
Warning Maximum Match Rate	
Warning Minimum Match Rate	
Critical Maximum Match Rate	

C.6.2 LogAgent::Log Size

The LogAgent::Log Size probe monitors log file growth and collects the following metrics:

- Size — The size the log file has grown in bytes since the probe last ran.
- Output Rate — The number of bytes per minute the log file has grown since the probe last ran.
- Lines — The number of lines written to the log file since the probe last ran.
- Line Rate — The number of lines written per minute to the log file since the probe last ran.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe. For this probe to run, the **`nocpulse`** user must be granted read access to your log files.

Table C.31 *LogAgent::Log Size settings*

Field	Value
Log file*	/var/log/messages
Timeout*	20
Critical Maximum Size	
Warning Maximum Size	
Warning Minimum Size	
Critical Minimum Size	
Critical Maximum Output Rate	
Warning Maximum Output Rate	

Field	Value
Warning Minimum Output Rate	
Critical Minimum Output Rate	
Critical Maximum Lines	
Warning Maximum Lines	
Warning Minimum Lines	
Critical Minimum Lines	
Critical Maximum Line Rate	
Warning Maximum Line Rate	
Warning Minimum Line Rate	
Critical Minimum Line Rate	

C.7 MySQL 3.23 - 3.33

The probes in this section monitor aspects of the MySQL database using the `mysqladmin` binary. No specific user privileges are needed for these probes.

Note that the `mysql-server` package must be installed on the system conducting the monitoring for these probes to complete. Refer to the MySQL Installation section of the *SUSE Manager Installation Guide* for instructions.

C.7.1 MySQL::Database Accessibility

The MySQL::Database Accessibility probe tests connectivity through a database account that has no database privileges. If no connection is made, a CRITICAL status results.

Table C.32 *MySQL::Database Accessibility settings*

Field	Value
Username*	
Password	
MySQL Port	3306
Database*	mysql
Timeout	15

C.7.2 MySQL::Opened Tables

The MySQL::Opened Tables probe monitors the MySQL server and collects the following metric:

- Opened Tables — The tables that have been opened since the server was started.

Table C.33 *MySQL::Opened Tables settings*

Field	Value
Username	
Password	
MySQL Port*	3306
Timeout	15
Critical Maximum Opened Objects	
Warning Maximum Opened Objects	
Warning Minimum Opened Objects	

Field	Value
Critical Minimum Opened Objects	

C.7.3 MySQL::Open Tables

The MySQL::Open Tables probe monitors the MySQL server and collects the following metric:

- Open Tables — The number of tables open when the probe runs.

Table C.34 *MySQL::Open Tables settings*

Field	Value
Username	
Password	
MySQL Port*	3306
Timeout	15
Critical Maximum Open Objects	
Warning Maximum Open Objects	
Warning Minimum Open Objects	
Critical Minimum Open Objects	

C.7.4 MySQL::Query Rate

The MySQL::Query Rate probe monitors the MySQL server and collects the following metric:

- Query Rate — The average number of queries per second per database server.

Table C.35 *MySQL::Query Rate settings*

Field	Value
Username	
Password	
MySQL Port*	3306
Timeout	15
Critical Maximum Query Rate	
Warning Maximum Query Rate	
Warning Minimum Query Rate	
Critical Minimum Query Rate	

C.7.5 MySQL::Threads Running

The MySQL::Threads running probe monitors the MySQL server and collects the following metric:

- Threads Running — The total number of running threads within the database.

Table C.36 *MySQL::Threads Running settings*

Field	Value
Username	
Password	
MySQL Port*	3306
Timeout	15

Field	Value
Critical Maximum Threads Running	
Warning Maximum Threads Running	
Warning Minimum Threads Running	
Critical Minimum Threads Running	

C.8 Network Services

The probes in this section monitor various services integral to a functioning network. When applying them, ensure that their timed thresholds do not exceed the amount of time allotted to the timeout period. Otherwise, an UNKNOWN status is returned in all instances of extended latency, thereby nullifying the thresholds.

C.8.1 Network Services::DNS Lookup

The Network Services::DNS Lookup probe uses the `dig` command to see if it can resolve the system or domain name specified in the *Host or Address to look up* field. It collects the following metric:

- Query Time — The time in milliseconds required to execute the `dig` request.

This is useful in monitoring the status of your DNS servers. To monitor one of your DNS servers, supply a well-known host/domain name, such as a large search engine or corporate Web site.

Table C.37 *Network Services::DNS Lookup settings*

Field	Value
Host or Address to look up	
Timeout*	10

Field	Value
Critical Maximum Query Time	
Warning Maximum Query Time	

C.8.2 Network Services::FTP

The Network Services::FTP probe uses network sockets to test FTP port availability. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the FTP server to answer a connection request.

This probe supports authentication. Provide a username and password in the appropriate fields to use this feature.The optional *Expect* value is the string to be matched against after a successful connection is made to the FTP server. If the expected string is not found, the probe returns a CRITICAL state.

Table C.38 *Network Services::FTP settings*

Field	Value
Expect	FTP
Username	
Password	
FTP Port*	21
Timeout*	10
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.3 Network Services::IMAP Mail

The Network Services::IMAP Mail probe determines if it can connect to the IMAP 4 service on the system. Specifying an optional port will override the default port 143. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the IMAP server to answer a connection request.

The required *Expect* value is the string to be matched against after a successful connection is made to the IMAP server. If the expected string is not found, the probe returns a CRITICAL state.

Table C.39 *Network Services::IMAP Mail settings*

Field	Value
IMAP Port*	143
Expect*	OK
Timeout*	5
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.4 Network Services::Mail Transfer (SMTP)

The Network Services::Mail Transfer (SMTP) probe determines if it can connect to the SMTP port on the system. Specifying an optional port number overrides the default port 25. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the SMTP server to answer a connection request.

Table C.40 Network Services::Mail Transfer (SMTP) settings

Field	Value
SMTP Port*	25
Timeout*	10
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.5 Network Services::Ping

The Network Services::Ping probe determines if the SUSE Manager server can `ping` the monitored system or a specified IP address. It also checks the packet loss and compares the round trip average against the Warning and Critical threshold levels. The required *Packets to send* value allows you to control how many ICMP ECHO packets are sent to the system. This probe collects the following metrics:

- Round-Trip Average — The time it takes in milliseconds for the ICMP ECHO packet to travel to and from the monitored system.

- Packet Loss — The percent of data lost in transit.

Although optional, the *IP Address* field can be instrumental in collecting metrics for systems that have multiple IP addresses. For instance, if the system is configured with multiple virtual IP addresses or uses Network Address Translation (NAT) to support internal and external IP addresses, this option may be used to check a secondary IP address rather than the primary address associated with the hostname.

Note that this probe conducts the `ping` from an SUSE Manager server and not the monitored system. Populating the IP address field does not test connectivity between the system and the specified IP address but between the SUSE Manager server and the IP address. Therefore, entering the same IP address for Ping probes on different systems accomplishes precisely the same task. To conduct a `ping` from a monitored system to an individual IP address, use the Remote Ping probe instead. Refer to Section C.8.7, “Network Services::Remote Ping” (page 277).

Table C.41 *Network Services::Ping settings*

Field	Value
IP Address (defaults to system IP)	
Packets to send*	20
Timeout*	10
Critical Maximum Round-Trip Average	
Warning Maximum Round-Trip Average	
Critical Maximum Packet Loss	
Warning Maximum Packet Loss	

C.8.6 Network Services::POP Mail

The Network Services::POP Mail probe determines if it can connect to the POP3 port on the system. A port number must be specified; specifying another port number overrides the default port 110. This probe collects the following metric:

- Remote Service Latency — The time it takes in seconds for the POP server to answer a connection request.

The required *Expect* value is the string to be matched against after a successful connection is made to the POP server. The probe looks for the string in the first line of the response from the system. The default is **+OK**. If the expected string is not found, the probe returns a CRITICAL state.

Table C.42 *Network Services::POP Mail settings*

Field	Value
Port*	110

Field	Value
Expect*	+OK
Timeout*	10
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.7 Network Services::Remote Ping

The Network Services::Remote Ping probe determines if the monitored system can `ping` a specified IP address. It also monitors the packet loss and compares the round trip average against the Warning and Critical threshold levels. The required *Packets to send* value allows you to control how many ICMP ECHO packets are sent to the address. This probe collects the following metrics:

- Round-Trip Average — The time it takes in milliseconds for the ICMP ECHO packet to travel to and from the IP address.

- Packet Loss — The percent of data lost in transit.

The *IP Address* field identifies the precise address to be pinged. Unlike the similar, optional field in the standard ping probe, this field is required. The monitored system directs the ping to a third address, rather than to the SUSE Manager server. Since the remote ping probe tests connectivity from the monitored system, another IP address must be specified. To conduct pings from the SUSE Manager server to a system or IP address, use the standard Ping probe instead. Refer to Section C.8.5, “Network Services::Ping” (page 275).

Requirements — The SUSE Manager Monitoring Daemon (`rhnmd`) must be running on the monitored system to execute this probe.

Table C.43 Network Services::Remote Ping settings

Field	Value
IP Address*	
Packets to send*	20
Timeout*	10
Critical Maximum Round-Trip Average	
Warning Maximum Round-Trip Average	
Critical Maximum Packet Loss	
Warning Maximum Packet Loss	

C.8.8 Network Services::RPCService

The Network Services::RPCService probe tests the availability of remote procedure call (RPC) programs on a given IP address. It collects the following metric:

- Remote Service Latency — The time it takes in seconds for the RPC server to answer a connection request.

RPC server programs, which provide function calls via that RPC network, register themselves with the RPC network by declaring a program ID and a program name. NFS is an example of a service that works via the RPC mechanism.

Client programs that wish to use the resources of RPC server programs do so by asking the machine on which the server program resides to provide access to RPC functions within the RPC program number or program name. These conversations can occur over either TCP or UDP (but are almost always UDP).

This probe allows you to test simple program availability. You must specify the program name or number, the protocol over which the conversation occurs, and the usual timeout period.

Table C.44 *Network Services::RPCService settings*

Field	Value
Protocol (TCP/UDP)	udp
Service Name*	nfs
Timeout*	10
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.9 Network Services::Secure Web Server (HTTPS)

The Network Services::Secure Web Server (HTTPS) probe determines the availability of the secure Web server and collects the following metric:

- Remote Service Latency — The time it takes in seconds for the HTTPS server to answer a connection request.

This probe confirms that it can connect to the HTTPS port on the specified host and retrieve the specified URL. If no URL is specified, the probe fetches the root document. The probe looks for a HTTP/1. message from the system unless you alter that value. Specifying another port number overrides the default port of 443.

This probe supports authentication. Provide a username and password in the appropriate fields to use this feature. Unlike most other probes, this probe returns a CRITICAL status if it cannot contact the system within the timeout period.

Table C.45 *Network Services::Secure Web Server (HTTPS) settings*

Field	Value
URL Path	/

Field	Value
Expect Header	HTTP/1
Expect Content	
UserAgent*	NOCpulse-check_http/1.0
Username	
Password	
Timeout*	10
HTTPS Port*	443
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.10 Network Services::SSH

The Network Services::SSH probe determines the availability of SSH on the specified port and collects the following metric:

- Remote Service Latency — The time it takes in seconds for the SSH server to answer a connection request.

Upon successfully contacting the SSH server and receiving a valid response, the probe displays the protocol and server version information. If the probe receives an invalid response, it displays the message returned from the server and generates a WARNING state.

Table C.46 *Network Services::SSH settings*

Field	Value
SSH Port*	22

Field	Value
Timeout*	5
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.8.11 Network Services::Web Server (HTTP)

The Network Services::Web Server (HTTP) probe determines the availability of the Web server and collects the following metric:

- Remote Service Latency — The time it takes in seconds for the HTTP server to answer a connection request.

This probe confirms it can connect to the HTTP port on the specified host and retrieve the specified URL. If no URL is specified, the probe will fetch the root document. The probe looks for a HTTP/1. message from the system, unless you alter that value. Specifying another port number will override the default port of 80. Unlike most other probes, this probe will return a CRITICAL status if it cannot contact the system within the timeout period.

This probe supports authentication. Provide a username and password in the appropriate fields to use this feature. Also, the optional Virtual Host field can be used to monitor a separate documentation set located on the same physical machine presented as a standalone server. If your Web server is not configured to use virtual hosts (which is typically the case), you should leave this field blank. If you do have virtual hosts configured, enter the domain name of the first host here. Add as many probes as necessary to monitor all virtual hosts on the machine.

Table C.47 *Network Services::Web Server (HTTP) settings*

Field	Value
URL Path	/
Virtual Host	

Field	Value
Expect Header	HTTP/1
Expect Content	
UserAgent*	NOCpulse-check_http/1.0
Username	
Password	
Timeout*	10
HTTP Port*	80
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.9 Oracle 8i, 9i, 10g, and 11g

The probes in this section may be applied to instances of the Oracle database matching the versions supported. Oracle probes require the configuration of the database and associations made by running the following command:

```
$ORACLE_HOME/rdbms/admin/catalog.sql
```

In addition, for these probes to function properly, the Oracle user configured in the probe must have minimum privileges of CONNECT and SELECT_CATALOG_ROLE.

Some Oracle probes are specifically aimed at tuning devices for long-term performance gains, rather than avoiding outages. Therefore, it is recommended to schedule them to occur less frequently, between every hour and every two days. This provides a better statistical representation, de-emphasizing anomalies that can occur at shorter time intervals. This applies to following probes: Buffer Cache, Data Dictionary Cache, Disk Sort Ratio, Library Cache, and Redo Log.

For CRITICAL and WARNING thresholds based upon time to work as intended, their values cannot exceed the amount of time allotted to the timeout period. Otherwise, an UNKNOWN status is returned in all cases of extended latency, thereby nullifying the thresholds. For this reason, it is strongly recommended to ensure that timeout periods exceed all timed thresholds. In this section, this refers specifically to the probe TNS Ping.

Finally, customers using these Oracle probes against a database using Oracle's Multi-Threaded Server (MTS) must contact Novell support to have entries added to the SUSE Manager Server's `/etc/hosts` file to ensure that the DNS name is resolved correctly.

C.9.1 Oracle::Active Sessions

The Oracle::Active Sessions probe monitors an Oracle instance and collects the following metrics:

- Active Sessions — The number of active sessions based on the value of `V$PARAMETER.PROCESSES`.
- Available Sessions — The percentage of active sessions that are available based on the value of `V$PARAMETER.PROCESSES`.

***Table C.48** Oracle::Active Sessions settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Critical Maximum Active Sessions	
Warning Maximum Active Sessions	

Field	Value
Critical Maximum Available Sessions Used	
Warning Maximum Available Sessions Used	

C.9.2 Oracle::Availability

The Oracle::Availability probe determines the availability of the database from SUSE Manager.

Table C.49 *Oracle::Availability settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30

C.9.3 Oracle::Blocking Sessions

The Oracle::Blocking Sessions probe monitors an Oracle instance and collects the following metric:

- Blocking Sessions — The number of sessions preventing other sessions from committing changes to the Oracle database, as determined by the required *Time Blocking* value you provide. Only those sessions that have been blocking for this duration, which is measured in seconds, are counted as blocking sessions.

Table C.50 *Oracle::Blocking Sessions settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Time Blocking (seconds)*	20
Timeout*	30
Critical Maximum Blocking Sessions	
Warning Maximum Blocking Sessions	

C.9.4 Oracle::Buffer Cache

The Oracle::Buffer Cache probe computes the Buffer Cache Hit Ratio so as to optimize the system global area (SGA) Database Buffer Cache size. It collects the following metrics:

- Db Block Gets — The number of blocks accessed via single block gets (not through the consistent get mechanism).

- Consistent Gets — The number of accesses made to the block buffer to retrieve data in a consistent mode.

- Physical Reads — The cumulative number of blocks read from disk.

- Buffer Cache Hit Ratio — The rate at which the database goes to the buffer instead of the hard disk to retrieve data. A low ratio suggests more RAM should be added to the system.

Table C.51 Oracle::Buffer Cache settings

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port	1521
Timeout*	30
Warning Minimum Buffer Cache Hit Ratio	
Critical Minimum Buffer Cache Hit Ratio	

C.9.5 Oracle::Client Connectivity

The Oracle::Client Connectivity probe determines if the database is up and capable of receiving connections from the monitored system. This probe opens an `rhnmd` connection to the system and issues a `sqlplus connect` command on the monitored system.

The *Expected DB name* parameter is the expected value of `V$DATABASE.NAME`. This value is case-insensitive. A CRITICAL status is returned if this value is not found.

Requirements — The SUSE Manager monitoring daemon (`rhnmd`) must be running on the monitored system to execute this probe. For this probe to run, the **`nocpulse`** user must be granted read access to your log files.

Table C.52 Oracle::Client Connectivity settings

Field	Value
Oracle Hostname or IP address*	
Oracle SID*	

Field	Value
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
ORACLE_HOME*	/opt/oracle
Expected DB Name*	
Timeout*	30

C.9.6 Oracle::Data Dictionary Cache

The Oracle::Data Dictionary Cache probe computes the Data Dictionary Cache Hit Ratio so as to optimize the SHARED_POOL_SIZE in `init.ora`. It collects the following metrics:

- Data Dictionary Hit Ratio — The ratio of cache hits to cache lookup attempts in the data dictionary cache. In other words, the rate at which the database goes to the dictionary instead of the hard disk to retrieve data. A low ratio suggests more RAM should be added to the system.
- Gets — The number of blocks accessed via single block gets (not through the consistent get mechanism).
- Cache Misses — The number of accesses made to the block buffer to retrieve data in a consistent mode.

Table C.53 *Oracle::Data Dictionary Cache settings*

Field	Value
Oracle SID*	
Oracle Username*	

Field	Value
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Warning Minimum Data Dictionary Hit Ratio	
Critical Minimum Data Dictionary Hit Ratio	

C.9.7 Oracle::Disk Sort Ratio

The Oracle::Disk Sort Ratio probe monitors an Oracle database instance and collects the following metric:

- Disk Sort Ratio — The rate of Oracle sorts that were too large to be completed in memory and were instead sorted using a temporary segment.

Table C.54 *Oracle::Disk Sort Ratio settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Critical Maximum Disk Sort Ratio	
Warning Maximum Disk Sort Ratio	

C.9.8 Oracle::Idle Sessions

The Oracle::Idle Sessions probe monitors an Oracle instance and collects the following metric:

- Idle Sessions — The number of Oracle sessions that are idle, as determined by the required *Time Idle* value you provide. Only those sessions that have been idle for this duration, which is measured in seconds, are counted as idle sessions.

Table C.55 *Oracle::Idle Sessions settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Time Idle (seconds)*	20
Timeout*	30
Critical Maximum Idle Sessions	
Warning Maximum Idle Sessions	

C.9.9 Oracle::Index Extents

The Oracle::Index Extents probe monitors an Oracle instance and collects the following metric:

- Allocated Extents — The number of allocated extents for any index.

- Available Extents — The percentage of available extents for any index.

The required *Index Name* field contains a default value of % that matches any index name.

Table C.56 *Oracle::Index Extents settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Index Owner*	%
Index Name*	%
Timeout*	30
Critical Maximum of Allocated Extents	
Warning Maximum of Allocated Extents	
Critical Maximum of Available Extents	
Warning Maximum of Available Extents	

C.9.10 Oracle::Library Cache

The Oracle::Library Cache probe computes the Library Cache Miss Ratio so as to optimize the SHARED_POOL_SIZE in `init.ora`. It collects the following metrics:

- Library Cache Miss Ratio — The rate at which a library cache pin miss occurs. This happens when a session executes a statement that it has already parsed but finds that the statement is no longer in the shared pool.

- Executions — The number of times a pin was requested for objects of this namespace.

- Cache Misses — The number of pins of objects with previous pins since the object handle was created that must now retrieve the object from disk.

Table C.57 *Oracle::Library Cache settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Critical Maximum Library Cache Miss Ratio	
Warning Maximum Library Cache Miss Ratio	

C.9.11 Oracle::Locks

The Oracle::Locks probe monitors an Oracle database instance and collects the following metric:

- Active Locks — The current number of active locks as determined by the value in the v$locks table. Database administrators should be aware of high numbers of locks present in a database instance.

Locks are used so that multiple users or processes updating the same data in the database do not conflict. This probe is useful for alerting database administrators when a high number of locks are present in a given instance.

Table C.58 *Oracle::Locks settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Critical Maximum Active Locks	
Warning Maximum Active Locks	

C.9.12 Oracle::Redo Log

The Oracle::Redo Log probe monitors an Oracle database instance and collects the following metrics:

- Redo Log Space Request Rate — The average number of redo log space requests per minute since the server has been started.
- Redo Buffer Allocation Retry Rate — The average number of buffer allocation retries per minute since the server was started.

The metrics returned and the thresholds they are measured against are numbers representing the rate of change in events per minute. The rate of change for these metrics should be monitored because fast growth can indicate problems requiring investigation.

Table C.59 *Oracle::Redo Log settings*

Field	Value
Oracle SID*	

Field	Value
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Timeout*	30
Critical Maximum Redo Log Space Request Rate	
Warning Maximum Redo Log Space Request Rate	
Critical Maximum Redo Buffer Allocation Retry Rate	
Warning Maximum Redo Buffer Allocation Retry Rate	

C.9.13 Oracle::Table Extents

The Oracle::Table Extents probe monitors an Oracle database instance and collects the following metrics:

- Allocated Extents-Any Table — The total number of extents for any table.

- Available Extents-Any Table — The percentage of available extents for any table.

In Oracle, table extents allow a table to grow. When a table is full, it is *extended* by an amount of space configured when the table is created. Extents are configured on a per-table basis, with an extent size and a maximum number of extents.

For example, a table that starts with 10 MB of space and that is configured with an extent size of 1 MB and max extents of 10 can grow to a maximum of 20 MB (by being extended by 1 MB ten times). This probe can be configured to alert by (1) the number of allocated extents (e.g. "go critical when the table has been extended 5 or more times"), or (2) the table is extended past a certain percentage of its max extents (e.g. "go critical when the table has exhausted 80% or more of its max extents").

The required *Table Owner* and *Table Name* fields contain a default value of `%` that matches any table owner or name.

Table C.60 *Oracle::Table Extents settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Table Owner*	%
Table Name*	%
Timeout*	30
Critical Maximum Allocated Extents	
Warning Maximum Allocated Extents	
Critical Maximum Available Extents	
Warning Maximum Available Extents	

C.9.14 Oracle::Tablespace Usage

The Oracle::Tablespace Usage probe monitors an Oracle database instance and collects the following metric:

- Available Space Used — The percentage of available space in each tablespace that has been used.

Tablespace is the shared pool of space in which a set of tables live. This probe alerts the user when the total amount of available space falls below the threshold. Tablespace is measured in bytes, so extents do not factor into it directly (though each extension removes available space from the shared pool).

The required *Tablespace Name* field is case insensitive and contains a default value of `%` that matches any table name.

Table C.61 *Oracle::Tablespace Usage settings*

Field	Value
Oracle SID*	
Oracle Username*	
Oracle Password*	
Oracle Port*	1521
Tablespace Name*	%
Timeout*	30
Critical Maximum Available Space Used	
Warning Maximum Available Space Used	

C.9.15 Oracle::TNS Ping

The Oracle::TNS Ping probe determines if an Oracle listener is alive and collects the following metric:

- Remote Service Latency — The time it takes in seconds for the Oracle server to answer a connection request.

Table C.62 Oracle::TNS Ping settings

Field	Value
TNS Listener Port*	1521
Timeout*	15
Critical Maximum Remote Service Latency	
Warning Maximum Remote Service Latency	

C.10 SUSE Manager

The probes in this section may be applied to the SUSE Manager itself to monitor its health and performance. Since these probes run locally, no specific application or transport protocols are required.

C.10.1 SUSE Manager::Disk Space

The SUSE Manager::Disk Space probe monitors the free disk space on a SUSE Manager and collects the following metrics:

- File System Used — The percent of the current file system now in use.
- Space Used — The file size used by the current file system.
- Space Available — The file size available to the current file system.

Table C.63 SUSE Manager::Disk Space settings

Field	Value
Device Pathname*	/dev/hda1
Critical Maximum File System Used	

Field	Value
Warning Maximum File System Used	
Critical Maximum Space Used	
Warning Maximum Space Used	
Critical Maximum Space Available	
Warning Maximum Space Available	

C.10.2 SUSE Manager::Execution Time

The SUSE Manager::Execution Time probe monitors the execution time for probes run from a SUSE Manager and collects the following metric:

- Probe Execution Time Average — The seconds required to fully execute a probe.

Table C.64 *SUSE Manager::Execution Time settings*

Field	Value
Critical Maximum Probe Execution Time Average	
Warning Maximum Probe Execution Time Average	

C.10.3 SUSE Manager::Interface Traffic

The SUSE Manager::Interface Traffic probe monitors the interface traffic on a SUSE Manager and collects the following metrics:

- Input Rate — The amount of traffic in bytes per second the device receives.
- Output Rate — The amount of traffic in bytes per second the device sends.

Table C.65 SUSE Manager::Interface Traffic settings

Field	Value
Interface*	eth0
Timeout (seconds)*	30
Critical Maximum Input Rate	
Critical Maximum Output Rate	

C.10.4 SUSE Manager::Latency

The SUSE Manager::Latency probe monitors the latency of probes on SUSE Manager and collects the following metric:

- Probe Latency Average — The lag in seconds between the time a probe becomes ready to run and the time it is actually run. Under normal conditions, this is generally less than a second. When SUSE Manager is overloaded (because it has too many probes with respect to their average execution time), the number goes up.

Table C.66 SUSE Manager::Latency settings

Field	Value
Critical Maximum Probe Latency Average	
Warning Maximum Probe Latency Average	

C.10.5 SUSE Manager::Load

The SUSE Manager::Load probe monitors the CPU load on a SUSE Manager and collects the following metric:

- Load — The load average on the CPU for a 1-, 5-, and 15-minute period.

Table C.67 SUSE Manager::Load settings

Field	Value
Critical Maximum 1-minute Average	
Warning Maximum 1-minute Average	
Critical Maximum 5-minute Average	
Warning Maximum 5-minute Average	
Critical Maximum 15-minute Average	
Warning Maximum 15-minute Average	

C.10.6 SUSE Manager::Probe Count

The SUSE Manager::Probe Count probe monitors the number of probes on SUSE Manager and collects the following metric:

- Probes — The number of individual probes running on SUSE Manager.

Table C.68 SUSE Manager::Probe Count settings

Field	Value
Critical Maximum Probe Count	
Warning Maximum Probe Count	

C.10.7 SUSE Manager::Process Counts

The SUSE Manager::Process Counts probe monitors the number of processes on SUSE Manager and collects the following metrics:

- Blocked — The number of processes that have been switched to the waiting queue and waiting state.

- Child — The number of processes spawned by another process already running on the machine.

- Defunct — The number of processes that have terminated (either because they have been killed by a signal or have called `exit()`) and whose parent processes have not yet received notification of their termination by executing some form of the `wait()` system call.

- Stopped — The number of processes that have stopped before their executions could be completed.

- Sleeping — A process that is in the `Interruptible` sleep state and that can later be reintroduced into memory, resuming execution where it left off.

Table C.69 *SUSE Manager::Process Counts settings*

Field	Value
Critical Maximum Blocked Processes	
Warning Maximum Blocked Processes	
Critical Maximum Child Processes	
Warning Maximum Child Processes	
Critical Maximum Defunct Processes	
Warning Maximum Defunct Processes	
Critical Maximum Stopped Processes	
Warning Maximum Stopped Processes	
Critical Maximum Sleeping Processes	
Warning Maximum Sleeping Processes	

C.10.8 SUSE Manager::Processes

The SUSE Manager::Processes probe monitors the number of processes on SUSE Manager and collects the following metric:

- Processes — The number of processes running simultaneously on the machine.

Table C.70 *SUSE Manager::Processes settings*

Field	Value
Critical Maximum Processes	
Warning Maximum Processes	

C.10.9 SUSE Manager::Process Health

The SUSE Manager::Process Health probe monitors customer-specified processes and collects the following metrics:

- CPU Usage — The CPU usage percent for a given process.

- Child Process Groups — The number of child processes spawned from the specified parent process. A child process inherits most of its attributes, such as open files, from its parent.

- Threads — The number of running threads for a given process. A thread is the basic unit of CPU utilization, and consists of a program counter, a register set, and a stack space. A thread is also called a lightweight process.

- Physical Memory Used — The amount of physical memory in kilobytes being used by the specified process.

- Virtual Memory Used — The amount of virtual memory in kilobytes being used by the specified process, or the size of the process in real memory plus swap.

Specify the process by its command name or process ID. (PID). Entering a PID overrides the entry of a command name. If no command name or PID is entered, the error `Command not found` is displayed and the probe is set to a CRITICAL state.

Table C.71 SUSE Manager::Process Health settings

Field	Value
Command Name	
Process ID (PID) file	
Timeout*	15
Critical Maximum CPU Usage	
Warning Maximum CPU Usage	
Critical Maximum Child Process Groups	
Warning Maximum Child Process Groups	
Critical Maximum Threads	
Warning Maximum Threads	
Critical Maximum Physical Memory Used	
Warning Maximum Physical Memory Used	
Critical Maximum Virtual Memory Used	
Warning Maximum Virtual Memory Used	

C.10.10 SUSE Manager::Process Running

The SUSE Manager::Process Running probe verifies that the specified process is running. Specify the process by its command name or process ID. (PID). Entering a PID overrides the entry of a command name. A Critical status results if the probe cannot verify the command or PID.

Table C.72 *SUSE Manager::Process Running settings*

Field	Value
Command Name	
Process ID (PID) file	
Critical Number Running Maximum	
Critical Number Running Minimum	

C.10.11 SUSE Manager::Swap

The SUSE Manager::Swap probe monitors the percent of free swap space available on SUSE Manager. A CRITICAL status results if the value falls below the Critical threshold. A WARNING status results if the value falls below the Warning threshold.

Table C.73 *SUSE Manager::Swap settings*

Field	Value
Critical Minimum Swap Percent Free	
Warning Minimum Swap Percent Free	

C.10.12 SUSE Manager::Users

The SUSE Manager::Users probe monitors the number of users currently logged into SUSE Manager. A CRITICAL status results if the value exceeds the Critical threshold. A WARNING status results if the value exceeds the Warning threshold.

Table C.74 *SUSE Manager::Users settings*

Field	Value
Critical Maximum Users	

Field	Value
Warning Maximum Users	

About SUSE Manager and Spacewalk

D

SUSE® Manager' main purpose is to efficiently manage a set of Linux systems and keep them up-to-date. You can register both SUSE® Linux Enterprise and Red Hat Enterprise Linux client systems with the SUSE Manager server.

SUSE Manager is based on the Spacewalk project, http://spacewalk.redhat.com/. This allows for seamless migration when switching from Red Hat Network Satellite or a Spacewalk server to SUSE Manager. Both user experience and tools are mostly unchanged, which means that you can use the known commands and the scripts that may already exist on your side.

However, as SUSE Manager is deployed as an appliance based on SUSE Linux Enterprise, some differences exist with regards to environments and tools:

Reporting and Downloading Software Packages

Instead of connecting to Red Hat Network, SUSE Manager connects to Novell Customer Center (NCC) (http://www.novell/center) to receive updates or patches. NCC also provides the entitlements for enabling specific SUSE Manager functionality.

Automatic Deployment

Automated installation on Red Hat Enterprise Linux client systems is done with Kickstart. For SUSE Linux Enterprise client systems, SUSE Manager uses AutoYaST.

Software Management

Is done with `yum` on Red Hat Enterprise Linux client systems. For SUSE Linux Enterprise client systems, SUSE Manager uses `zypper`.

Command Line Tools

The Spacewalk command line tools also work for SUSE Manager. Additionally, symbolic links have been added for a number of commands. For example, `rhn-profile-sync` is also available as `mgr-profile-sync`.

Package Names

Some SUSE Manager package names are different from the original Spacewalk ones.

Glossary

Action

A task that is scheduled by a system administrator using SUSE Manager to be performed on one or more client systems. For example, an action can be scheduled to update the kernel packages on all the systems within a selected group.

Activation Key

SUSE Manager Management and Provisioning customers can generate activation keys through the SUSE Manager website. Each unique key can then be used to “activate” (register) a client system (either SLE or RHEL), entitle the system to SUSE Manager, subscribe the system to specific channels, and subscribe the system to SUSE Manager system groups through the command line utility `rhnreg_ks` from the bootstrap script.

Base Channel

A base channel is a type of Channel (page 307) that consists of a list of packages based on a specific architecture and SUSE release. For example, all the packages in SUSE Linux Enterprise Server 11 SP1 for the x86 architecture make a base channel.

Bug Fix Alert

An Patch Alert (page 309) that pertains to a bug fix.

Bugzilla

Bugzilla is an online application (http://bugzilla.novell.com) that allows users to communicate directly with the developers. From Bugzilla, users can submit bug reports and feature requests for SUSE Linux Enterprise and related open source packages.

Certificate Authority

A Certificate Authority distributes digital signatures to users as part of public key infrastructure for encrypted authentication and communication.

Channel

A channel is a list of software packages. There are two types of channels: base channels and child channels. Channels are used to choose packages to be installed from client systems. Every client system must be subscribed to one Base Channel (page 307) and can be subscribed to one or more Child Channel (page 308).

Channel Administrator

A user role with full access to channel management capabilities. Users with this role are capable of creating channels, assigning packages to channels, cloning channels, and deleting channels. This role can be assigned by an organization administrator through the *Users* tab of the Web interface.

Child Channel

A child channel is a Channel (page 307) associated with a Base Channel (page 307) but contains extra packages.

Client System

See Registered System (page 310).

Digital Certificate

A client component in XML format that is stored in the `/etc/sysconfig/rhn/systemid` file on registered systems. SUSE Manager verifies this certificate to authenticate the registered system before each connection. This certificate is issued by SUSE and passed to the system as part of the registration process. It includes unique information about the registered system to avoid fraudulent use.

Email Notification

Similar to an Patch Alert (page 309) , except the information is delivered via email. If the email notifications option is selected, notifications are sent for every Patch Alert (page 309). The email includes the type of patch alert, summary of the patches, description of the patch, and a list of which systems are affected by the report.

Enhancement Alert

A Patch Alert (page 309) that pertains to a package enhancement request.

Organization Administrator

A user role with the highest level of control over an organization's SUSE Manager account. Members of this role can add other users, systems, and system groups to the organization as well as remove them.

Patches

Information published by SUSE describing security fixes, bug fixes, and package enhancements for SUSE Linux Enterprise Server. The information includes the topics of the patch, Bugzilla bug IDs, relevant releases/architectures, solutions including required RPMs, and file checksums for verification. Each Novell Patch Alert (page 309) is based on the SUSE Linux Enterprise patch list.

Security issues and bug fixes are submitted by SUSE engineers as well as the Linux community through Bugzilla which generates a bug report for each issue. SUSE engineering evaluates the reports, resolves the bug, and generates new RPM packages. After the SUSE quality assurance team tests new packages they are placed on the SUSE public file server and a patch is generated.

Patch Alert

Patch alert that updated packages based on SUSE patches are available for one or more systems within an organization. There are three types of patch alerts: security alerts, bug fix alerts, and enhancement alerts.

Management

One of Novell's service level offerings. It has more features than the update service level, including user management, system groups, and enhanced system details.

Notification Method

An email address to which SUSE Manager monitoring messages will be sent.

Package

All software in SUSE Linux Enterprise is divided into software packages. Software updates are released in the form of RPM packages that can be installed on a SUSE Linux Enterprise system.

Probe

A set of criteria that is either a template or a set of values assigned to a system that is used to measure the performance of a system.

Probe State

The measure of a probe's adherence to its defined criteria. States include: OK, Warning, Critical, Pending, Unknown

Probe Suite

collection or group of SUSE Manager monitoring probes.

Provisioning

One of the Novell Customer Center service level offerings. It has more features than the Management service level, including autoinstalling, reconfiguring, tracking, and reverting systems.

Red Hat Update Agent

A client application for Red Hat Enterprise Linux client systems that allows users to retrieve and install all updated packages for the client system on which the application is run. Use the Red Hat Update Agent Configuration Tool to configure its preferences, including whether to install the packages after they are downloaded. For Red Hat Enterprise Linux 5 clients, use the `yum` command; for Red Hat Enterprise Linux 4 clients and lower, use the `up2date` command. For SUSE Linux Enterprise clients, the equivalent is the `zypper up` command.

Registered System

A system that is registered with SUSE Manager. Also known as a client system.

RPM

A software package manager that was developed by Red Hat Inc. It can be used to build, install, query, verify, update, and uninstall software packages. All software updates from SUSE Manager are delivered in RPM format.

RPM Database

Each SUSE Linux Enterprise system has an RPM database that stores information about all the RPM packages installed on the system. This information includes the version of the package, which files were installed with the package, a brief description of the package, the installation date, and more.

RPM Update

Deliver the RPM packages based on the Patch Alert (page 309) list to a client system without user intervention. If this feature is selected, packages are delivered through the SUSE Manager Daemon (page 311) running on the client system.

Security Alert

An Patch Alert (page 309) that pertains to system security.

Service Level

A Novell subscription service. Different service levels offer different features of SUSE Manager. There are three paid service levels currently available: update, management, and provisioning.

Sibling

Siblings are virtual guests running on the same host. Virtual guests that run on separate hosts are not siblings.

Software Manager

The name of the first Service Level (page 310) offering for SUSE Manager.

SUSE Manager Administrator

SUSE Manager Administrator are sets of users that have the highest level of control over an organization's SUSE Manager account. Members of this group can add users, systems, and system groups to the organization as well as remove them. An SUSE Manager Administrator can also give users administrative privileges to system groups. An organization must have at least one member of the SUSE Manager Administrator group.

SUSE Manager Bootstrap Script

The bootstrap script (`bootstrap.sh`) is a script on your SUSE Manager server which has to be enabled in *Admin* > *SUSE Manager Configuration* > *Bootstrap Script* first before its initial use. It is executed on clients and collects all information needed by the SUSE Manager server like System Profile (page 311) and Digital Certificate (page 308). The script establishes a connection to your server and registers the clients.

SUSE Manager Daemon

The SUSE Manager client daemon (`rhnsd`) that periodically polls for scheduled actions.

System Directory

The System Directory section of SUSE Manager allows an organization to divide its client systems into system groups. Only members of the SUSE Manager Administrator (page 311) group can add systems to the organization.

System ID

A unique string of characters and numbers that identifies a registered system. It is stored in the system's Digital Certificate (page 308).

System Profile

Hardware and software information about the client system. It is created during the registration process. The software information is a list of RPM packages and their versions installed on the client system. The system profile is used to determine every Patch Alert (page 309) relevant to each client system.

System Set Manager

Interface that allows users to perform actions on multiple systems. Actions include applying patch updates, upgrading packages, and adding/removing systems to/from system groups.

Update

One of the Novell Customer Center service level offerings.

Traceback

A traceback is a detailed description of “what went wrong” that is useful for troubleshooting SUSE Manager. Tracebacks are automatically generated when a critical error occurs and are mailed to the individual(s) designated in the SUSE Manager's configuration file.

Virtual Guest

Any of the virtual instances running on the virtual host, under the control of the hypervisor. Also referred to as domain U or domU.

Virtual Host

The physical system that supports the hypervisor and all guest systems. The virtual host may also be referred to as domain 0, or dom0.

Yellowdog Updater Modified (yum)

The Yellowdog Updater Modified is the Red Hat Network client application (`yum`) that allows users to retrieve and install new or updated packages for the client system on which the application is run.

Zypper

Zypper is a command line package manager for installing, updating and removing packages as well as for managing repositories.