Abstract

This manual provides information about using the Unbreakable Linux Network (ULN).

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Preface

The *Oracle Linux Unbreakable Linux Network User's Guide* provides information about how to register your systems with the Unbreakable Linux Network (ULN), and includes procedures for creating a local yum server as well as a guide to using the `yum` command itself.

Audience

This document is intended for administrators who want to use the Unbreakable Linux Network (ULN). It is assumed that readers are familiar with web technologies and have a general understanding of Linux system administration.

Document Organization

The document is organized as follows:

- **Chapter 1**, *The Unbreakable Linux Network* describes how to access and use the software channels that are available on the Unbreakable Linux Network (ULN).

- **Chapter 2**, *Yum* describes how to use the `yum` utility to install and upgrade software packages, and how to set up a local yum server.

- **Appendix A**, *ULN Channels* lists the main channels that are available for Oracle Linux 5 and Oracle Linux 6 on the supported platform architectures.

Related Documents

The documentation for this product is available at:


Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><strong>monospace</strong></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
Chapter 1 The Unbreakable Linux Network

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This chapter describes how to access and use the software channels that are available on the Unbreakable Linux Network (ULN).

1.1 About the Unbreakable Linux Network

If you have a subscription to Oracle Unbreakable Linux support, you can use the comprehensive resources of the Unbreakable Linux Network (ULN). ULN offers software patches, updates, and fixes for Oracle Linux and Oracle VM, as well as information on yum, Ksplice, and support policies. You can also download useful packages that are not included in the original distribution. The ULN Alert Notification Tool periodically checks with ULN and alerts you when updates are available. You can access ULN at https://linux.oracle.com/, where you will also find instructions for registering with ULN, for creating local yum repositories, and for switching from the Red Hat Network (RHN) to ULN.

If you want to use yum with ULN to manage your systems, you must register the systems with ULN and subscribe each system to one or more ULN channels. When you register a system with ULN, the channel that contains the latest version is chosen automatically according to the architecture and operating system revision of the system.

When you run yum, it connects to the ULN server repository and downloads the latest software packages in RPM format onto your system. yum then presents you with a list of the available packages so that you can choose which ones you want to install.

1.2 About ULN Channels

ULN provides more than 100 unique channels, which support the i386, x86_64, and IA64 architectures, for releases of Oracle Linux 4 update 6 and later and Oracle VM 2.1 and later.
You can choose for your system to remain at a specific OS revision, or you can allow the system to be updated with packages from later revisions.

You should subscribe to the channel that corresponds to the architecture of your system and the update level at which you want to maintain it. Patches and errata are available for specific revisions of Oracle Linux, but you do not need to upgrade from a given revision level to install these fixes. ULN channels also exist for MySQL, Oracle VM, Oracle Ksplice, OCFS2, RDS, and productivity applications.

The following table describes the main channels that are available.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>_latest</td>
<td>Provides all the packages in a distribution, including any errata that are also provided in the patch channel. Unless you explicitly specify the version, any package that you download on this channel will be the most recent that is available. If no vulnerabilities have been found in a package, the package version might be the same as that included in the original distribution. For other packages, the version will be the same as that provided in the patch channel for the highest update level. For example, the <code>ol6_arch_latest</code> channel for Oracle Linux 6 Update 3 contains a combination of the <code>ol6_u3_arch_base</code> and <code>ol6_u3_arch_patch</code> channels.</td>
</tr>
<tr>
<td>_base</td>
<td>Provides the packages for each major version and minor update of Oracle Linux and Oracle VM. This channel corresponds to the released ISO media image. For example, there is a base channel for each of the updates to Oracle Linux 6 as well as for Oracle Linux 6. Oracle does not publish security errata and bugfixes on these channels.</td>
</tr>
<tr>
<td>_patch</td>
<td>Provides only those packages that have changed since the initial release of a major or minor version of Oracle Linux or Oracle VM. The patch channel always provides the most recent version of a package, including all fixes that have been provided since the initial version was released.</td>
</tr>
<tr>
<td>_addons</td>
<td>Provides packages that are not included in the base distribution, such as the package that you can use to create a yum repository on Oracle Linux 6.</td>
</tr>
<tr>
<td>_oracle</td>
<td>Provides freely downloadable RPMs from Oracle that you can install on Oracle Linux, such as ASMLib and Oracle Instant Client.</td>
</tr>
<tr>
<td>_optional</td>
<td>Provides optional packages for Oracle Linux 7 that have been sourced from upstream. This channel includes most development packages (<code>*-devel</code>).</td>
</tr>
</tbody>
</table>

Other channels may also be available, such as _beta channels for the beta versions of packages.

As each new major version or minor update of Oracle Linux becomes available, Oracle creates new base and patch channels for each supported architecture to distribute the new packages. The existing base and patch channels for the previous versions or updates remain available and do not include the new packages. The _latest channel distributes the highest possible version of any package, and tracks the top of the development tree independently of the update level.

**Caution**

You can choose to maintain your system at a specific update level of Oracle Linux and selectively apply errata to that level by subscribing the system to the _base and _patch channels and unsubscribing it from the _latest channel. However, for Oracle Linux 7, patches are not added to the _patch channel for previous updates after a new update has been released. For example, after the release of Oracle Linux 7 Update 1, no further errata will be released on the `ol7_x86_64_u0_patch` channel.
Oracle recommends that you keep your system subscribed to the _latest_ channel. If you unsubscribe from the _latest_ channel, your system will become vulnerable to security-related issues when a new update is released.

1.3 About Software Errata

Oracle releases important changes to Oracle Linux and Oracle VM software as individual package updates known as errata, which are made available for download on ULN before they are gathered into a release or are distributed via the _patch_ channel.

Errata packages can contain:

- Security advisories, which have names prefixed by _ELSA-*_ (for Oracle Linux) and _OVMSA-*_ (for Oracle VM).
- Bug fix advisories, which have names prefixed by _ELBA-*_ and _OVMBA-*_.
- Feature enhancement advisories, which have names prefixed by _ELEA-*_ and _OVMEA-*_.

To be notified when new errata packages are released, you can subscribe to the Oracle Linux and Oracle VM errata mailing lists at [https://oss.oracle.com/mailman/listinfo/el-errata](https://oss.oracle.com/mailman/listinfo/el-errata) and [https://oss.oracle.com/mailman/listinfo/oraclevm-errata](https://oss.oracle.com/mailman/listinfo/oraclevm-errata).

If you are logged into ULN, you can also subscribe to these mailing lists by following the Subscribe to Enterprise Linux Errata mailing list and Subscribe to Oracle VM Errata mailing list links that are provided on the Errata tab.

1.4 Registering as a ULN User

When you register a system with ULN, your Oracle Single Signon (SSO) user name is also registered as your ULN user name. If you want to use ULN without first registering a system, you can register as a ULN user provided that you have a valid customer support identifier (CSI) for Oracle Linux support or Oracle VM support. To purchase Oracle Linux or Oracle VM support, go to the online Oracle Linux Store or contact your sales representative.

To register as a ULN user:

1. In a browser, go to [https://linux.oracle.com/register](https://linux.oracle.com/register).
2. If you do not have an SSO account, click Create New Single Signon Account and follow the onscreen instructions to create one.
   
   If you already have an SSO account, click Sign On.
3. Log in using your SSO user name and password.
4. On the Create New ULN User page, enter your CSI and click Create New User.

**Note**

If no administrator is currently assigned to manage the CSI, you are prompted to click Confirm to become the CSI administrator. If you click Cancel, you cannot access the CSI administration feature. See Section 1.14, “About CSI Administration”.

If your user name already exists on the system, you are prompted to proceed to ULN by clicking the link Unbreakable Linux Network. If you enter a different
Registering an Oracle Linux 6 or Oracle Linux 7 System

1.5 Registering an Oracle Linux 6 or Oracle Linux 7 System

To register an Oracle Linux 6 or Oracle Linux 7 system with ULN.

1. Run the `uln_register` command.

   ```
   # uln_register
   ```

   Alternatively, if you use the GNOME graphical user desktop, select **System > Administration > ULN Registration** on Oracle Linux 6 or **Applications > System Tools > ULN Registration** on Oracle Linux 7. You can also register your system with ULN if you configure networking when installing Oracle Linux 6 or Oracle Linux 7.

2. When prompted, enter your ULN user name, password, and customer support identifier (CSI).

3. Enter a name for the system that will allow you to identify it on ULN, and choose whether to upload hardware and software profile data that allows ULN to select the appropriate packages for the system.

4. If you have an Oracle Linux Premier Support account, you can choose to configure an Oracle Linux 6 or Oracle Linux 7 system that is running a supported kernel to receive kernel updates from Oracle Ksplice.

   The `yum-rhn-plugin` is enabled and your system is subscribed to the appropriate software channels.

   If you use a proxy server for Internet access, see Section 2.2.1, “Configuring Use of a Proxy Server”.

   For information about registering to use Ksplice, see the *Oracle Linux Ksplice User's Guide*.

1.6 Registering an Oracle Linux 4 or Oracle Linux 5 System

To register an Oracle Linux 4 or Oracle Linux 5 system with ULN.

1. Import the RPM GPG key.

   ```
   # rpm --import /etc/pki/rpm-gpg/RPM-GPG-KEY
   ```

2. Run the text-mode version of the `up2date` command.

   ```
   # up2date-nox --register
   ```

3. When prompted, enter your ULN user name, password, and CSI.

4. Enter the name of the system that will be displayed on ULN, and choose whether to upload hardware and software profile data that will allow ULN to select the appropriate packages for your system.

   For information about registering to use Ksplice, see the *Oracle Linux Ksplice User's Guide*.

1.7 Configuring an Oracle Linux 5 System to Use yum with ULN

If your Oracle Linux 5 system is registered with ULN, you can use `yum` instead of `up2date` to download and install packages. If you have installed a full update since Oracle Linux 5 Update 6 was released on January 20, 2010, your system should already be able to use `yum` with ULN.

To enable `yum` support:
1. Install `yum-rhn-plugin`.

```bash
# up2date --install yum-rhn-plugin
```

2. If your organization uses a proxy server as an intermediary for Internet access, specify the `enableProxy` and `httpProxy` settings in `/etc/sysconfig/rhn/up2date` as shown in this example.

```plaintext
enableProxy=1
httpProxy=http://proxysvr.yourdom.com:3128
```

If the proxy server requires authentication, additionally specify the `enableProxyAuth`, `proxyUser`, and `proxyPassword` settings:

```plaintext
enableProxy=1
enableProxyAuth=1
httpProxy=http://proxysvr.yourdom.com:3128
proxyUser=yumacc
proxyPassword=clydenw
```

Caution

All `yum` users require read access to `/etc/sysconfig/rhn/up2date`. If this file must be world-readable, do not use a password that is the same as any user’s login password, and especially not `root`’s password.

With the plugin installed and the proxy server (if any) specified, you can immediately start to use `yum` instead of `up2date`.

1.8 Disabling Package Updates

To disable package updates by ULN (for example, if you have deleted your system from ULN), edit the `/etc/yum/pluginconf.d/rhnplugin.conf` file, and change the value of `enabled` flag from 1 to 0 in the `[main]` section, for example:

```plaintext
[main]
enabled = 0
gpgcheck = 1
```

To disable updates for particular packages, add an `exclude` statement to the `[main]` section of the `/etc/yum.conf` file. For example, to exclude updates for `VirtualBox` and `kernel`:

```plaintext
exclude=VirtualBox* kernel*
```

Note

Excluding certain packages from being updated can cause dependency errors for other packages. Your machine might also become vulnerable to security-related issues if you do not install the latest updates.

1.9 Subscribing Your System to ULN Channels

If you have registered your system with ULN, you can subscribe the system to the channels that are available for the level of support associated with the CSI.

To subscribe your system to ULN channels:

1. Log in to [http://linux.oracle.com](http://linux.oracle.com) with your ULN user name and password.
2. On the Systems tab, click the link named for the system in the list of registered machines.

3. On the System Details page, click Manage Subscriptions.

4. On the System Summary page, select channels from the list of available or subscribed channels and click the arrows to move the channels between the lists.

5. When you have finished selecting channels, click Save Subscriptions.

1.10 Browsing and Downloading Errata Packages

You can browse the advisories that are available on ULN, and download the errata RPMs for the supported combinations of the software release and the system architecture.

To browse the advisories and download errata RPMs:

1. Log in to http://linux.oracle.com with your ULN user name and password.

2. Select the Errata tab.

   The Errata page displays a table of the available errata for all releases that are available on ULN.

3. On the Errata page, you can perform the following actions on the displayed errata:

   • To sort the table of available errata, click the title of the Type, Severity, Advisory, Systems Affected, or Release Date column. Click the title again to reverse the order of sorting.

     Note

     The Systems Affected column shows how many of your systems are potentially affected by an advisory.

   • To display or hide advisories of different types, select or deselect the Bug, Enhancement, and Security check boxes and click Go.

   • To display only advisories for a certain release of Oracle Linux or Oracle VM, select that release from the Release drop-down list and click Go.

   • To search within the table, enter a string in the Search field and click Go.

4. To see more detail about an advisory and to download the RPMs:

   a. Click the link for the advisory.

   b. On the Errata Detail page for an advisory, you can download the RPMs for the supported releases and system architectures. The Superseded By Advisory column displays a link to the most recent advisory (if any) that replaces the advisory you are browsing.

1.11 Downloading Available Errata for a System

You can download a comma-separated values (CSV) report file of the errata that are available for your system and you can download errata RPMs.

To download a CSV report or the errata RPMs:

1. Log in to http://linux.oracle.com with your ULN user name and password.

2. On the Systems tab, click the link named for the system in the list of registered machines.
The System Details page lists the available errata for the system in the Available Errata table, which might be split over several pages.

3. To download the CSV report file, click the link Download All Available Errata for this System.

4. To see more detail about an advisory and to download the RPMs:
   a. Click the link for the advisory.
   b. On the System Errata Detail page for an advisory, you can download the RPMs for the affected releases and system architectures.

1.12 Updating System Details

If you have registered your system with ULN, you can update the details that ULN records for the system.

To update the details for your system:
1. Log in to http://linux.oracle.com with your ULN user name and password.
2. On the Systems tab, click the link named for the system in the list of registered machines.
3. On the System Details page, click Edit.
4. On the Edit System Properties page, you can change the name associated with your system, register it as a local yum server for your site, or change the CSI with which it is registered.

**Note**

You cannot change the CSI of a system unless it is registered to your user name.

5. When you have finished making changes, click Apply Changes.

1.13 Deleting a System

To delete a system that is registered on ULN:
1. Log in to http://linux.oracle.com with your ULN user name and password.
2. On the Systems tab, click the link named for the system in the list of registered machines.
3. On the System Details page, click Delete.

**Note**

You cannot delete a system unless it is registered to your user name.

4. When prompted to confirm the deletion, click OK.

1.14 About CSI Administration

The CSI administration feature of ULN provides a unified view of all of your organization's CSIs and the systems that are registered with those CSIs. To be able to manage the registered systems, you must become an administrator for one or more of your organization's CSIs. To be able to view and change the details of any system that is not registered to your ULN user name, you must become an administrator for the CSI under which that system is registered.
If you are registered as a CSI administrator, you can access the CSI Administration tab while logged in to ULN and perform the following tasks:

- Assign yourself as administrator of a CSI, or assign someone else as administrator of a CSI. See Section 1.14.1, “Becoming a CSI Administrator”.

- List active CSIs, list the servers that are currently registered with an active CSI, and transfer those servers to another user or to another CSI. See Section 1.14.2, “Listing Active CSIs and Transferring Their Registered Servers”.

- List expired CSIs, list the servers that are currently registered with an expired CSI, and transfer those servers to another user or to another CSI. See Section 1.14.3, “Listing Expired CSIs and Transferring Their Registered Servers”.

- Remove yourself or someone else as administrator of a CSI. See Section 1.14.4, “Removing a CSI Administrator”.

Figure 1.1 shows a representative example of an organization with three CSIs, only two of which have CSI administrators.

**Figure 1.1 Example of an Organization with three CSIs**

CSI 1 has two registered users, Alice and Bob, who each have three systems registered to them.

CSI 2 also has two registered users, Alice and Carol, who each have two systems registered to them.

CSI 3 has one registered user, Dan, who has a single system registered to him.

Alice is registered as an administrator for both CSI 1 and CSI 2. She can view the details of both CSIs, including all systems and users that are registered with those CSIs. She can move systems between CSI 1 and CSI 2, and reassign systems between users in both CSI 1 and CSI 2. She can also assign additional administrators to CSI 1 and CSI 2, or remove administrators from CSI 1 and CSI 2. She cannot see any details for CSI 3.

Carol is registered as an administrator only for CSI 2. She can view the details of that CSI and of all systems and users that are registered with it, including Alice’s systems. She can reassign systems between users in CSI 2, but she cannot move systems to the other CSIs. She can assign additional administrators to CSI 2, or remove administrators from CSI 2. She cannot see any details for CSI 1 or CSI 3.

Bob can view only the details of the systems that are registered to him in CSI 1. He cannot see any details for Alice’s systems in CSI 1.
Dan is not registered as an administrator for CSI 3. He can view only the details of the system that is registered to him in CSI 3.

Neither Bob nor Dan can perform CSI administration tasks. For example, they cannot move systems between CSIs nor can they reassign systems to other users. However, as CSI 3 does not currently have an administrator, Dan can choose to become its administrator. As CSI 1 already has Alice as its administrator, Bob cannot become an administrator unless Alice grants him that privilege.

For Alice to become an administrator of CSI 3, Dan should register as the administrator of CSI 3 so that he can add Alice as an administrator.

### 1.14.1 Becoming a CSI Administrator

You can become an administrator of a CSI in one of the following ways:

- When you register with ULN, if no administrator is currently assigned to manage the CSI, you are prompted to click **Confirm** to become the CSI administrator. If you click **Cancel**, you cannot access the CSI administration feature.

- When logged into ULN, if you access the System tab and no administrator is currently assigned to manage one of the CSIs for which you are registered, you are prompted to choose whether to become the CSI administrator.

To become a CSI administrator:

1. Click the red link labeled **enter the CSI you would like to be the administrator for in this page**.
2. On the Add CSI page, verify the CSI and click **Confirm**.

#### Note

On the Systems page, the CSIs of all systems that have no assigned administrator are also shown in red.

- If you are already an administrator of a CSI, you can add yourself as administrator of another CSI provided that you have registered either a server or your ULN user name with the other CSI.

To assign yourself as administrator of an additional CSI:

1. Log in to ULN and select the CSI Administration tab.
2. On the Managed CSIs page, click **Add CSI**.
3. On the Assign Administrator page, enter the CSI, and click **Add**.
4. If there are existing administrators, the page lists these administrators and prompts you to click **Confirm** to confirm your request. Each administrator is sent an email to inform them that you have added yourself as an administrator of the CSI.

- An administrator for a CSI can add you as an administrator for the same CSI.

To assign another administrator to a CSI:

1. Log in to ULN as administrator of the CSI, and select the CSI Administration tab.
2. On the Managed CSIs page, click **List Administrators**.
3. On the CSI Administrators page, click **Assign Administrator**.
4. On the Assign Administrator page in the Select New Administrator list, click the + icon that is next to the user name of the user that you want to add as an administrator. Their user name is added to the Administrator box.

5. If you administer more than one CSI, select the CSI that the user will administer from the CSI drop down list.

6. Click Assign Administrator.

Note
If you want to become the administrator of a CSI but the person to whom it is registered is no longer with your organization, contact an Oracle support representative to request that you be made the administrator for the CSI.

1.14.2 Listing Active CSIs and Transferring Their Registered Servers

To list details of the active CSIs for which you are the administrator:

1. Log in to ULN as administrator of the CSI, and select the CSI Administration tab.

2. On the Managed CSIs page in the Select Managed CSI Services pane, select the Active link. The Managed Active CSI Services pane displays the service details for each active CSI that you administer.

3. Click the View # Server(s) link to display the details of the servers that are registered to an active CSI.

4. On the Registered Servers page, you can transfer one or more systems to another user or to another CSI that you administer.

Note
If you transfer a system to another user, at least one of the following conditions must be true:

• His or her user name must be registered to this CSI.
• One or more of the servers, for which they are the owner, must be registered to this CSI.
• He or she must be an administrator of at least one CSI for which you are also an administrator.

To transfer systems to another user:

a. Select the Transfer System check boxes for the systems that you want to transfer.

b. Click Transfer Selected Systems to Another Owner.

c. On the Transfer Registered System(s) - Owner page in the Transfer To column, click the red arrow icon that is next to the user name of the user to whom you want to transfer ownership.

d. On the Confirm Transfer Profile - Owner page, click Apply Changes to confirm the transfer to the new owner.

To transfer systems to another CSI:

a. Select the Transfer System check boxes for the systems that you want to transfer.
b. Click **Transfer Selected Systems to Another CSI**.

c. On the Transfer Registered System(s) - CSI page in the Transfer To column, click the red arrow icon that is next to the CSI to which you want to transfer the systems.

d. On the Confirm Transfer Profile - CSI page, click **Apply Changes** to confirm the transfer to the new CSI.

### 1.14.3 Listing Expired CSIs and Transferring Their Registered Servers

To list details of the expired CSIs for which you are the administrator:

1. Log in to ULN as administrator of the CSI, and select the CSI Administration tab.

2. On the Managed CSIs page in the Select Managed CSI Services pane, select the **Expired** link. The Managed Expired CSI Services pane displays the service details for each expired CSI that you administer.

3. Click the **View # Server(s)** link to display the details of the servers that are registered to an expired CSI.

4. On the Registered Servers page, you can transfer one or more systems to another user or to another CSI that you administer.

   **Note**

   If you transfer a system to another user, at least one of the following conditions must be true:

   - His or her user name must be registered to this CSI.
   - One or more of the servers, for which they are the owner, must be registered to this CSI.
   - He or she must be an administrator of at least one CSI for which you are also an administrator.

To transfer systems to another user:

a. Select the **Transfer System** check boxes for the systems that you want to transfer.

b. Click **Transfer Selected Systems to Another Owner**.

c. On the Transfer Registered System(s) - Owner page in the Transfer To column, click the red arrow icon that is next to the user name of the user to whom you want to transfer ownership.

d. On the Confirm Transfer Profile - Owner page, click **Apply Changes** to confirm the transfer to the new owner.

To transfer systems to another CSI:

a. Select the **Transfer System** check boxes for the systems that you want to transfer.

b. Click **Transfer Selected Systems to Another CSI**.

c. On the Transfer Registered System(s) - CSI page in the Transfer To column, click the red arrow icon that is next to the CSI to which you want to transfer the systems.
Removing a CSI Administrator

d. On the Confirm Transfer Profile - CSI page, click **Apply Changes** to confirm the transfer to the new CSI.

### 1.14.4 Removing a CSI Administrator

To remove an administrator who is registered for a CSI:

1. Log in to ULN and select the CSI Administration tab.

2. On the Managed CSIs page, click **List Administrators**.

3. On the CSI Administrators page in the Delete? column, click the trash can icon that is next to the user name of the user that you want to remove as administrator for the CSI specified in the same row.

4. When prompted to confirm that you want to revoke administration privileges for the CSI from that user, click **OK**.

### 1.15 Switching from RHN to ULN

**Note**

This procedure is for a Red Hat Enterprise Linux 6 system. For details of equivalent procedures for Red Hat Enterprise Linux 3, 4, and 5, see [http://linux.oracle.com/switch.html](http://linux.oracle.com/switch.html).

If you have an Oracle Linux 6 system that is registered with the Red Hat Network (RHN), you can use the **uln_register** utility to register it as described in Section 1.5, “Registering an Oracle Linux 6 or Oracle Linux 7 System”.

You must have a ULN account before you can register a system with ULN. You can create a ULN account at [http://linux.oracle.com/register](http://linux.oracle.com/register).

To register your system with ULN instead of RHN:


   If the **rhn-setup-gnome** package is already installed on your system, also download the **uln_register-gnome.tgz** from the same URL.

2. Extract the packages using the following command.

   ```bash
   # tar -xzf uln_register.tgz
   # tar -xzf uln_register-gnome.tgz
   ```

3. Change to the **uln_migrate** directory and install the registration packages.

   ```bash
   # cd ./uln_migrate
   # rpm -Uvh *.rpm
   ```

4. Run the **uln_register** command.

   ```bash
   # uln_register
   ```
5. Follow the instructions on the screen to complete the registration. The `uln_register` utility collects information about your system and uploads it to Oracle.

### 1.16 For More Information About ULN

You can find out more information about ULN at [https://linux.oracle.com/](https://linux.oracle.com/).
Chapter 2 Yum

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This chapter describes how you can use the yum utility to install and upgrade software packages.

2.1 About Yum

Oracle Linux provides the yum utility which you can use to install or upgrade RPM packages. The main benefit of using yum is that it also installs or upgrades any package dependencies. yum downloads the packages from repositories such as those that are available on the Unbreakable Linux Network (ULN) or the Oracle public yum server, but you can also set up your own repositories for use by systems that do not have Internet access.

If you have registered your system with ULN, you can use yum with ULN channels to maintain the software on your system, as described in Chapter 1, The Unbreakable Linux Network.

2.2 Yum Configuration

The main configuration file for yum is /etc/yum.conf. The global definitions for yum are located under the [main] section heading of the yum configuration file. The following table lists the important directives.

<table>
<thead>
<tr>
<th>Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cachedir</td>
<td>Directory used to store downloaded packages.</td>
</tr>
<tr>
<td>debuglevel</td>
<td>Logging level, from 0 (none) to 10 (all).</td>
</tr>
<tr>
<td>exactarch</td>
<td>If set to 1, only update packages for the correct architecture.</td>
</tr>
<tr>
<td>exclude</td>
<td>A space separated list of packages to exclude from installs or updates, for example: exclude=VirtualBox-4.* kernel*.</td>
</tr>
<tr>
<td>gpgcheck</td>
<td>If set to 1, verify the authenticity of the packages by checking the GPG signatures. You might need to set gpgcheck to 0 if a package is unsigned, but you should be wary that the package could have been maliciously altered.</td>
</tr>
<tr>
<td>gpgkey</td>
<td>Pathname of the GPG public key file.</td>
</tr>
</tbody>
</table>
Configuring Use of a Proxy Server

<table>
<thead>
<tr>
<th>Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>installonly_limit</td>
<td>Maximum number of versions that can be installed of any one package.</td>
</tr>
<tr>
<td>keepcache</td>
<td>If set to 0, remove packages after installation.</td>
</tr>
<tr>
<td>logfile</td>
<td>Pathname of the yum log file.</td>
</tr>
<tr>
<td>obsoletes</td>
<td>If set to 1, replace obsolete packages during upgrades.</td>
</tr>
<tr>
<td>plugins</td>
<td>If set to 1, enable plugins that extend the functionality of yum.</td>
</tr>
<tr>
<td>proxy</td>
<td>URL of a proxy server including the port number. See Section 2.2.1,</td>
</tr>
<tr>
<td></td>
<td>“Configuring Use of a Proxy Server”.</td>
</tr>
<tr>
<td>proxy_password</td>
<td>Password for authentication with a proxy server.</td>
</tr>
<tr>
<td>proxy_username</td>
<td>User name for authentication with a proxy server.</td>
</tr>
<tr>
<td>reposdir</td>
<td>Directories where yum should look for repository files with a .repo</td>
</tr>
<tr>
<td></td>
<td>extension. The default directory is /etc/yum.repos.d.</td>
</tr>
</tbody>
</table>

See the yum.conf(5) manual page for more information.

The following listing shows an example [main] section from the yum configuration file.

```
[main]
cachedir=/var/cache/yum
keepcache=0
debuglevel=2
logfile=/var/log/yum.log
exactarch=1
obsoletes=1
gpgkey=file://media/RPM-GPG-KEY
gpgcheck=1
plugins=1
installonly_limit=3
```

It is possible to define repositories below the [main] section in /etc/yum.conf or in separate repository configuration files. By default, yum expects any repository configuration files to be located in the /etc/yum.repos.d directory unless you use the reposdir directive to define alternate directories.

### 2.2.1 Configuring Use of a Proxy Server

If your organization uses a proxy server as an intermediary for Internet access, specify the proxy setting in /etc/yum.conf as shown in the following example.

```
proxy=http://proxysvr.yourdom.com:3128
```

If the proxy server requires authentication, additionally specify the proxy_username, and proxy_password settings.

```
proxy=http://proxysvr.yourdom.com:3128
proxy_username=yumacc
proxy_password=clydenw
```

If you use the yum plugin (yum-rhn-plugin) to access the ULN, specify the enableProxy and httpProxy settings in /etc/sysconfig/rhn/up2date as shown in this example.

```
enableProxy=1
httpProxy=http://proxysvr.yourdom.com:3128
```

If the proxy server requires authentication, additionally specify the enableProxyAuth, proxyUser, and proxyPassword settings.
2.2.2 Yum Repository Configuration

The yum configuration file or yum repository configuration files can contain one or more sections that define repositories.

The following table lists the basic directives for a repository.

<table>
<thead>
<tr>
<th>Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseurl</td>
<td>Location of the repository channel (expressed as a <code>file://</code>, <code>http://</code>, or <code>https://</code> address). This directive must be specified.</td>
</tr>
<tr>
<td>enabled</td>
<td>If set to 1, permit <code>yum</code> to use the channel.</td>
</tr>
<tr>
<td>name</td>
<td>Descriptive name for the repository channel. This directive must be specified.</td>
</tr>
</tbody>
</table>

Any other directive that appears in this section overrides the corresponding global definition in the `[main]` section of the yum configuration file. See the `yum.conf(5)` manual page for more information.

The following listing shows an example repository section from a configuration file.

```
[ol6_u2_base]
name=Oracle Linux 6 U2 - $basearch - base
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY
gpgcheck=1
enabled=1
```

In this example, the values of `gpgkey` and `gpgcheck` override any global setting. `yum` substitutes the name of the current system's architecture for the variable `$basearch`.

2.3 Using Yum from the Command Line

The following table shows some examples of common tasks that you can perform using `yum`.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>yum repolist</td>
<td>Lists all enabled repositories.</td>
</tr>
<tr>
<td>yum list</td>
<td>Lists all packages that are available in all enabled repositories and all packages that are installed on your system.</td>
</tr>
<tr>
<td>yum list installed</td>
<td>Lists all packages that are installed on your system.</td>
</tr>
<tr>
<td>yum list available</td>
<td>Lists all packages that are available to be installed in all enabled repositories.</td>
</tr>
<tr>
<td>yum search string</td>
<td>Searches the package descriptions for the specified string.</td>
</tr>
<tr>
<td>yum provides feature</td>
<td>Finds the name of the package to which the specified file or feature belongs. For example:</td>
</tr>
</tbody>
</table>
### Using Yum from the Command Line

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>yum provides /etc/sysconfig/atd</td>
<td></td>
</tr>
<tr>
<td>yum info package</td>
<td>Displays detailed information about the specified package. For example:</td>
</tr>
<tr>
<td></td>
<td>yum info bind</td>
</tr>
<tr>
<td>yum install package</td>
<td>Installs the specified package, including packages on which it depends. For example:</td>
</tr>
<tr>
<td></td>
<td>yum install ocfs2-tools</td>
</tr>
<tr>
<td>yum check-update</td>
<td>Checks whether updates exist for packages that are already installed on your system.</td>
</tr>
<tr>
<td>yum update package</td>
<td>Updates the specified package, including packages on which it depends. For example:</td>
</tr>
<tr>
<td></td>
<td>yum upgrade nfs-utils</td>
</tr>
<tr>
<td>yum update</td>
<td>Updates all packages, including packages on which they depend.</td>
</tr>
<tr>
<td>yum remove package</td>
<td>Removes the specified package. For example:</td>
</tr>
<tr>
<td></td>
<td>yum erase nfs-utils</td>
</tr>
<tr>
<td>yum erase package</td>
<td>Removes the specified package. This command has the same effect as the yum remove command.</td>
</tr>
<tr>
<td>yum update</td>
<td>Updates all packages, including packages on which they depend.</td>
</tr>
<tr>
<td>yum clean all</td>
<td>Removes all cached package downloads and cached headers that contain information about remote packages. Running this command can help to clear problems that can result from unfinished transactions or out-of-date headers.</td>
</tr>
<tr>
<td>yum help</td>
<td>Displays help about yum usage.</td>
</tr>
<tr>
<td>yum help command</td>
<td>Displays help about the specified yum command. For example:</td>
</tr>
<tr>
<td></td>
<td>yum help upgrade</td>
</tr>
<tr>
<td>yum shell</td>
<td>Runs the yum interactive shell.</td>
</tr>
</tbody>
</table>

See the `yum(8)` manual page for more information.

To list the files in a package, use the `repoquery` utility, which is included in the `yum-utils` package. For example, the following command lists the files that the `btrfs-progs` package provides.

```
# repoquery -l btrfs-progs
/sbin/btrfs
/sbin/btrfs-convert
/sbin/btrfs-debug-tree
```

**Note**

Yum makes no distinction between installing and upgrading a kernel package. Yum always installs a new kernel regardless of whether you specify `update` or `install`.  

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2.4 Downloading and Importing a GPG Key

Under some circumstances, such as when installing additional software in a virtual machine domain, you might need to download and import the GPG key to use with yum. To obtain and import a GPG key from the public yum repository:

1. Download the GPG key, for example with the `wget` command.

   ```
   # wget http://public-yum.oracle.com/RPM-GPG-KEY-oracle-ol7
   ```

   The following are the available GPG keys:
   - http://public-yum.oracle.com/RPM-GPG-KEY-oracle-el4

2. Check the fingerprint of the GPG key with the `gpg` command to make sure it matches the key published by Oracle.

   ```
   # gpg --quiet --with-fingerprint ./RPM-GPG-KEY-oracle-ol7
   ```

   The following are the published keys:
   - Oracle Linux 6 and 7:
     ```
     pub 2048R/EC551F03 2010-07-01 Oracle OSS group (Open Source Software group)
     Key fingerprint = 4214 4123 FECE C55B 9086 313D 72F9 7B74 EC55 1F03
     ```
   - Oracle Linux 5:
     ```
     pub 1024D/1E5E0159 2007-05-18 Oracle OSS group (Open Source Software group)
     Key fingerprint = 99FD 2766 28EE DECB 5E5A F5F8 66CE D3DE 1E5E 0159
     ```
   - Oracle Linux 4:
     ```
     pub 1024D/B38A8516 2006-09-05 Oracle OSS group (Open Source Software group)
     Key fingerprint = 1122 A29A B257 825F 322C 234E 2E2B CDBC B38A 8516
     sub 2048g/0042D4F4 2006-09-05 [expires: 2011-09-04]
     ```

3. If the fingerprint matches, import the GPG key with the `rpm` command.

   ```
   # rpm --import ./RPM-GPG-KEY-oracle-ol7
   ```

2.5 Yum Groups

A set of packages can themselves be organized as a yum group. Examples include the groups for Eclipse, fonts, and system administration tools. The following table shows the yum commands that you can use to manage these groups.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>yum grouplist</code></td>
<td>Lists installed groups and groups that are available for installation.</td>
</tr>
<tr>
<td><code>yum groupinfo groupname</code></td>
<td>Displays detailed information about a group.</td>
</tr>
<tr>
<td><code>yum groupinstall groupname</code></td>
<td>Installs all the packages in a group.</td>
</tr>
</tbody>
</table>
2.6 Installing and Using the Yum Security Plugin

The `yum-plugin-security` package allows you to use `yum` to obtain a list of all of the errata that are available for your system, including security updates. You can also use Oracle Enterprise Manager 12c Cloud Control or management tools such as Katello, Pulp, Red Hat Satellite, Spacewalk, and SUSE Manager to extract and display information about errata.

![Note]

The security plugin is integrated with `yum` in Oracle Linux 7. There are also minor differences in the output that the command displays.

To install the `yum-plugin-security` package, enter the following command:

```
# yum install yum-plugin-security
```

To list the errata that are available for your system, enter:

```
# yum updateinfo list
```

The output from the command sorts the available errata in order of their IDs, and it also specifies whether each erratum is a security patch (`severity/Sec.`), a bug fix (`bugfix`), or a feature enhancement (`enhancement`). Security patches are listed by their severity: Important, Moderate, or Low.

You can use the `--sec-severity` option to filter the security errata by severity, for example:

```
# yum updateinfo list --sec-severity=Moderate
```

To list the security errata by their Common Vulnerabilities and Exposures (CVE) IDs instead of their errata IDs, specify the keyword `cves` as an argument:

```
# yum updateinfo list cves
```

To list the security errata by their Common Vulnerabilities and Exposures (CVE) IDs instead of their errata IDs, specify the keyword `cves` as an argument:

```
# yum updateinfo list cves
```

```
CVE-2012-5659 Important/Sec. abrt-2.0.8-6.0.1.el6_3.2.x86_64
```
Similarly, the keywords **bugfix**, **enhancement**, and **security** filter the list for all bug fixes, enhancements, and security errata.

You can use the `--cve` option to display the errata that correspond to a specified CVE, for example:

```
# yum updateinfo list --cve CVE-2012-2677
Loaded plugins: refresh-packagekit, rhnplugin, security
ELSA-2013-0668 Moderate/Sec. boost-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-date-time-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-devel-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-filesystem-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-graph-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-iostreams-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-program-options-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-python-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-regex-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-serialization-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-signals-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-system-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-test-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-thread-1.41.0-15.el6_4.x86_64
ELSA-2013-0668 Moderate/Sec. boost-wave-1.41.0-15.el6_4.x86_64
updateinfo list done
```

To display more information, specify **info** instead of **list**, for example:

```
# yum updateinfo info --cve CVE-2012-2677
Loaded plugins: refresh-packagekit, rhnplugin, security
===============================================================================
boost security update
===============================================================================
Update ID : ELSA-2013-0668
Release : Oracle Linux 6
Type : security
Status : final
Issued : 2013-03-21
CVEs : CVE-2012-2677
Description : [1.41.0-15]
  : - Add in explicit dependences between some boost
    :  subpackages
  : [1.41.0-14]
  : - Build with -fno-strict-aliasing
  : [1.41.0-13]
  : - In Boost.Pool, be careful not to overflow
    : allocated chunk size (boost-1.41.0-pool.patch)
  : [1.41.0-12]
  : - Add an upstream patch that fixes computation of
    : CRC in zlib streams.
  : - Resolves: #707624
Severity : Moderate
updateinfo info done
```

To update all packages for which security-related errata are available to the latest versions of the packages, even if those packages include bug fixes or new features but not security errata, enter:
Creating and Using a Local ULN Mirror

To update all packages to the latest versions that contain security errata, ignoring any newer packages that do not contain security errata, enter:

```
# yum --security update
```

To update all kernel packages to the latest versions that contain security errata, enter:

```
# yum --security update-minimal kernel*
```

You can also update only those packages that correspond to a CVE or erratum, for example:

```
# yum update --cve CVE-2012-3954
# yum update --advisory ELSA-2012-1141
```

**Note**

Some updates might require you to reboot the system. By default, the boot manager will automatically enable the most recent kernel version.

For more information, see the `yum-security(8)` manual page.

### 2.7 Creating and Using a Local ULN Mirror

The following sections describe how to create and use a yum server that acts as a local mirror of the ULN channels.

#### 2.7.1 Prerequisites for the Local ULN Mirror

The system that you want to set up as a local ULN mirror must meet the following criteria:

- You must have registered the system with ULN. See *The Unbreakable Linux Network*.
- The system must be running Oracle Linux 5, Oracle Linux 6, or Oracle Linux 7.
- The system must have at least 6 GB of memory to create the yum metadata.
- The system must have enough disk space to store copies of the packages that it hosts. The following table shows the approximate amount of space that is required for Oracle Linux channels:

<table>
<thead>
<tr>
<th>Oracle Linux Channel</th>
<th>Space Required per Channel for Binaries Only</th>
<th>Space Required per Channel for Both Binaries and Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>[oe]l*_latest</td>
<td>Up to 10 GB</td>
<td>Up to 15 GB</td>
</tr>
<tr>
<td>[oe]l*_addons</td>
<td>600 MB</td>
<td>1 GB</td>
</tr>
<tr>
<td>[oe]l*_oracle</td>
<td>1 GB</td>
<td>Not applicable</td>
</tr>
<tr>
<td>[oe]l*_base</td>
<td>3 GB</td>
<td>5.5 GB</td>
</tr>
<tr>
<td>[oe]l*_patch</td>
<td>1 GB</td>
<td>2 GB</td>
</tr>
</tbody>
</table>

The next table shows the approximate amount of space that is required for Oracle VM channels:

<table>
<thead>
<tr>
<th>Oracle VM Channel</th>
<th>Space Required per Channel for Binaries Only</th>
<th>Space Required per Channel for Both Binaries and Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ovm*_latest</td>
<td>500 MB</td>
<td>1 GB</td>
</tr>
<tr>
<td>ovm*_base</td>
<td>400 MB</td>
<td>800 MB</td>
</tr>
</tbody>
</table>
2.7.2 Setting up a Local ULN Mirror

To set up a local system as a local ULN mirror:

1. Using a browser, log in at http://linux.oracle.com with the ULN user name and password that you used to register the system, and configure its properties on ULN as follows:
   a. On the Systems tab, click the link named for your system in the list of registered machines.
   b. On the System Details page, click Edit.
   c. On the Edit System Properties page, select the Yum Server check box and click Apply Changes.
   d. On the System Details page, click Manage Subscriptions.
   e. On the System Summary page, select channels from the list of available or subscribed channels and click the arrows to move the channels between the lists.

Modify the list of subscribed channels to include the channels that you want to make available to local systems.

**Note**

You must subscribe the system to the latest and addons channels for the installed operating system release (Oracle Linux 5, Oracle Linux 6, or Oracle Linux 7) and the system architecture (i386 or x86-64) to be able to install the yum-uln_mirror package. This package contains the uln-yum-mirror script that enables the system to act as a local ULN mirror.

For example, the following table shows some examples of the channels that are available for Oracle Linux 6 on the x86_64 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ol6_ga_x86_64_base</td>
<td>All packages for Oracle Linux 6 as initially released. This channel does not include errata.</td>
</tr>
<tr>
<td>ol6_x86_64_addons</td>
<td>Oracle Linux 6 add ons, including the yum-uln_mirror package.</td>
</tr>
<tr>
<td>ol6_x86_64_ksplice</td>
<td>Oracle Ksplice clients, updates, and dependencies for Oracle Linux 6. Note that access to this channel requires an Oracle Linux Premier Support account.</td>
</tr>
<tr>
<td>ol6_x86_64_latest</td>
<td>All packages released for Oracle Linux 6, including the latest errata packages.</td>
</tr>
<tr>
<td>ol6_x86_64_UEK_latest</td>
<td>Latest Unbreakable Enterprise Kernel Release 2 packages for Oracle Linux 6.</td>
</tr>
<tr>
<td>ol6_x86_64_UEK3_latest</td>
<td>Latest Unbreakable Enterprise Kernel Release 3 packages for Oracle Linux 6.</td>
</tr>
</tbody>
</table>

If you subsequently update the list of channels to which the system is subscribed, the uln-yum-mirror script updates the channels that the system mirrors. If you want to be able to use yum to...
Setting up a Local ULN Mirror

update the server from the repositories that it hosts rather than from ULN, follow the procedure in Section 2.7.5, “Configuring yum on a Local ULN Mirror”.

If you have an Oracle Linux Premier Support account and you want the yum server to host Ksplice packages for local Ksplice offline clients, subscribe to the Ksplice for Oracle Linux channels for the architectures and Oracle Linux releases that you want to support.

For a complete and up-to-date list of the available release channels, log on to ULN at http://linux.oracle.com.

f. When you have finished selecting channels, click **Save Subscriptions** and log out of ULN.

2. Install the Apache HTTP server.

```
# yum install httpd
```

3. Create a base directory for the yum repositories, for example `/var/yum` or `/var/www/html/yum`.

```
# mkdir -p /var/www/html/yum
```

**Note**
The yum repository owner must have read and write permissions on this directory.

4. If you created a base directory for the yum repository that is not under `/var/www/html` and SELinux is enabled in enforcing mode on your system:

a. Use the `semanage` command to define the default file type of the repository root directory hierarchy as `httpd_sys_content_t`:

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

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

```
/sbin/restorecon -R -v /var/yum
```

5. If you created a base directory for the yum repository that is not under `/var/www/html`, create a symbolic link in `/var/www/html` that points to the repository, for example:

```
# ln -s /var/yum /var/www/html/yum
```

6. Edit the HTTP server configuration file, `/etc/httpd/conf/httpd.conf`, as follows:

a. Specify the resolvable domain name of the server in the argument to `ServerName`.

```
ServerName server_addr:80
```

If the server does not have a resolvable domain name, enter its IP address instead.

b. Verify that the setting of the `Options` directive in the `<Directory "/var/www/html">` section specifies `Indexes` and `FollowSymLinks` to allow you to browse the directory hierarchy, for example:

```
Options Indexes FollowSymLinks
```

c. Save your changes to the file.

7. Start the HTTP server, and configure it to start after a reboot.
Setting up a Local ULN Mirror

- On Oracle Linux 5 or Oracle Linux 6, enter the following commands:

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

- On Oracle Linux 7, enter the following commands:

  ```
  # systemctl start httpd
  # systemctl enable httpd
  ```

8. If you have enabled a firewall on your system, configure it to allow incoming HTTP connection requests on TCP port 80.

- On Oracle Linux 5 or Oracle Linux 6, enter the following commands:

  ```
  # iptables -I INPUT -p tcp --state --state NEW -m tcp --dport 80 -j ACCEPT
  # service iptables save
  ```

- On Oracle Linux 7, enter the following commands:

  ```
  # firewall-cmd --zone=zone --add-port=80/udp
  # firewall-cmd --permanent --zone=zone --add-port=80/udp
  ```

9. Install the `uln-yum-mirror` package:

  ```
  # yum install uln-yum-mirror
  ```

  This package contains the `uln-yum-mirror` script that enables the system to act as a local ULN mirror.

  **Note**

  If you have not subscribed the system to the correct Oracle Linux `latest` and `addons` channels for your system, the command fails with the error `No package uln-yum-mirror available`.

10. To configure the operation of the `/usr/bin/uln-yum-mirror` script, edit the `/etc/sysconfig/uln-yum-mirror` file.

    For example, if the base directory for the yum repositories is not `/var/www/html/yum`, set the value of the `REP_BASE` parameter to the correct base directory:

    ```
    REP_BASE=/var/yum
    ```

    Installing the `uln-yum-mirror` package also configures an `anacron` job (`/etc/cron.daily/uln-yum-mirror`) that updates the local yum repositories once every day. You can disable this job by setting the value of `CRON_ENABLED` to 0:

    ```
    CRON_ENABLED=0
    ```

    For more information about the configuration options in `/etc/sysconfig/uln-yum-mirror` file, see Section 2.7.3, “ULN Mirror Configuration”.

    The repositories are populated when the `anacron` job runs the `/usr/bin/uln-yum-mirror` script. Alternatively, you can run the script manually at any time to update the repositories. See Section 2.7.4, “Updating the Repositories on a Local ULN Mirror”.

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2.7.3 ULN Mirror Configuration

The `/etc/sysconfig/uln-yum-mirror` file contains the following configuration parameters that affect the behavior of the `/usr/bin/uln-yum-mirror` script:

- **ALL_PKGS**: Specifies whether `uln-yum-mirror` mirrors all versions of every available package or downloads only the latest version of each package. The default value of 1 causes `uln-yum-mirror` to mirror all versions of every available package. A value of 0 causes `uln-yum-mirror` to download only the latest version of each package.

- **CRON_ENABLED**: Specifies whether `uln-yum-mirror` runs automatically once per day. The default value of 1 enables `uln-yum-mirror` to be run automatically as an `anacron` job. A value of 0 disables the job. You must run `uln-yum-mirror` manually to update the packages.

- **HARDLINK_RPMS**: Specifies whether `uln-yum-mirror` runs `hardlinkpy` to create hard links between identical RPMs after the mirror process finishes. The default value of 1 enables hard linking, which saves storage space. It is not possible to create hard links across file systems. Set the value to 0 if the repository storage spans more than one file system.

- **LOG_OUTPUT**: Specifies whether `uln-yum-mirror` logs its output. The default value of 1 enables logging. A value of 0 disables logging.

- **REP_BASE**: Specifies the base directory for the repositories. The default setting is `/var/www/html/yum`. Do not change this setting unless you customize the configuration of the HTTP server.

- **REP_EL, REP_ENG, REP_OVM, REP_UEK**: Specify the names of the repositories. If required, you can configure alternate names.

- **REPO_FILE_DIR**: Not currently used.

- **SRC**: Specifies whether `uln-yum-mirror` mirrors source RPMs in addition to binary RPMs. The default value of 0 prevents `uln-yum-mirror` from mirroring source RPMs. A value to 1 causes `uln-yum-mirror` to mirror source RPMs.

- **YUM_GLOBAL_CACHE**: Specifies the yum global cache directory. The default setting is `/var/cache/yum`. Do not change this setting unless you customize the configuration of the HTTP server.

2.7.4 Updating the Repositories on a Local ULN Mirror

To update the repositories for the subscribed channels immediately without waiting for the `anacron` job to run or if you have disabled the job, enter the following command on the local ULN mirror server:

```
#/usr/bin/uln-yum-mirror
```

**Note**

If you have not yet set up the contents of the repositories, it can take many hours to download all the packages.
2.7.5 Configuring yum on a Local ULN Mirror

The following procedure configures the `yum` command on a server that is acting as a local ULN mirror to install package updates from itself rather than from ULN. The procedure does not affect the operation of the `uln-yum-mirror` script.

To configure a server that is acting as a local ULN Mirror to be able to install updated packages from itself:

1. Use the following command to list the channels that the server is mirroring from ULN:

   ```
   # yum repolist
   Loaded plugins: rhnplugin, security
   This system is receiving updates from ULN.
   0 packages excluded due to repository protections
   repo id                   repo name                                    status
   ol6_addons                Oracle Linux 6 Server Add ons (x86_64)       112
   ol6_x86_64_latest         Oracle Linux 6 Latest (x86_64)               17,976
   ol6_x86_64_UEKR3_latest   Latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux 6 (x86_64)        41
   ```

   In this example, the server mirrors the `ol6_addons`, `ol6_x86_64_latest`, and `ol6_x86_64_UEKR3_latest` channels from ULN.

2. Edit `/etc/yum/pluginconf.d/rhnplugin.conf` and disable the mirrored channels by adding the following stanza for each channel:

   ```
   [repo_id]
   enabled=0
   ```

   For example, to disable the `ol6_addons`, `ol6_x86_64_latest`, and `ol6_x86_64_UEKR3_latest` channels, you would add the following stanzas:

   ```
   [ol6_addons]
   enabled=0
   
   [ol6_x86_64_latest]
   enabled=0
   
   [ol6_x86_64_UEKR3_latest]
   enabled=0
   ```

   **Note**
   If you subsequently subscribe the system to any additional channels on ULN, you must also disable those channels in `/etc/yum/pluginconf.d/rhnplugin.conf`.

3. Configure the server as a yum client as described in Section 2.7.6, “Configuring Oracle Linux Yum Clients of a Local ULN Mirror”.

2.7.6 Configuring Oracle Linux Yum Clients of a Local ULN Mirror

If you have set up a local ULN mirror, you can configure your local Oracle Linux systems to receive yum updates from that server.

To configure an Oracle Linux system as a yum client:

1. Import the GPG key:

   ```
   # rpm --import /usr/share/rhn/RPM-GPG_KEY
   ```
2. In the `/etc/yum.repos.d` directory, edit the existing repository file, such as `public-yum-ol6.repo` or `ULN-base.repo`, and disable all entries by setting `enabled=0`.

3. In the `/etc/yum.repos.d` directory, create the file `local-yum.repo`, which contains entries such as the following for an Oracle Linux 6 yum client:

```plaintext
[local_ol6_latest]
name=Oracle Linux $releasever - $basearch - latest
baseurl=http://local_ulin_mirror/yum/OracleLinux/OL6/latest/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY
gpgcheck=1
enabled=1

[local_ol6_UEKR3_latest]
name=Unbreakable Enterprise Kernel Release 3 for Oracle Linux $releasever - $basearch - latest
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY
gpgcheck=1
enabled=1

[local_ol6_addons]
name=Oracle Linux $releasever - $basearch - addons
baseurl=http://local_ulin_mirror/yum/OracleLinux/OL6/addons/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY
gpgcheck=1
enabled=1
```

To distinguish the local repositories from the ULN repositories, prefix the names of their entries with a string such as `local_`. Replace `local_ulin_mirror` with the IP address or resolvable host name of the local ULN mirror. The example configuration enables the `local_ol6_latest`, `local_ol6_UEKR3_latest`, and `local_ol6_addons` channels.

4. To test the configuration:
   a. Clear the yum metadata cache:

   ```bash
   # yum clean metadata
   ```
   
   b. Use `yum repolist` to verify the configuration, for example:

   ```bash
   # yum repolist
   Loaded plugins: rhnplugin, security
   This system is receiving updates from ULN.
   0 packages excluded due to repository protections
   repo id   repo name                                    status
   local_ol6_addons  Oracle Linux 6 - x86_64 - latest   112
   local_ol6_x86_64_latest Oracle Linux 6 - x86_64 - latest 17,976
   local_ol6_x86_64_UEKR3_latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux 6 - x86_64 - latest 41
   ```

   If `yum` cannot connect to the local ULN mirror, check that the firewall settings on the local ULN mirror server allow incoming TCP connections to the HTTP port (usually, port 80).

5. You can now run `yum update` to pick up new updates from the local ULN mirror.

### 2.8 For More Information About Yum

For more information about yum, see the `yum(8)` and `yum.conf(5)` manual pages and `http://yum.baseurl.org/`. 
Appendix A ULN Channels

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A.6 Oracle VM 3 Channels ............................................................ 32

The following sections detail some of the channels that are available on ULN for Oracle Linux 5, Oracle Linux 6, Oracle Linux 7, Oracle VM 2.1, Oracle VM 2.2, and Oracle VM 3 on the supported platform architectures. Log in to ULN at http://linux.oracle.com to view the full, up-to-date list of available channels.

A.1 Oracle Linux 5 Channels

The following table shows a selection of the channels that are available for Oracle Linux 5 on the i386 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>el5_ga_i386_base</td>
<td>All packages released for Oracle Linux 5 GA. This channel does not include errata.</td>
</tr>
<tr>
<td>el5_i386_addons</td>
<td>Oracle Linux 5 add ons.</td>
</tr>
<tr>
<td>el5_i386_oracle</td>
<td>Oracle Software for Oracle Linux 5.</td>
</tr>
<tr>
<td>ol5_i386_ksplice</td>
<td>Oracle Ksplice clients, updates, and dependencies for Oracle Linux 5. Note that access to this channel requires an Oracle Linux Premier Support account.</td>
</tr>
<tr>
<td>ol5_i386_latest</td>
<td>All packages released for Oracle Linux 5 including the latest errata packages.</td>
</tr>
<tr>
<td>ol5_i386_UEK_latest</td>
<td>Latest packages for Unbreakable Enterprise Kernel Release 2 for Oracle Linux 5.</td>
</tr>
<tr>
<td>ol5_uN_i386_base</td>
<td>All packages released on the Oracle Linux 5 Update N installation media. This channel does not contain updates.</td>
</tr>
<tr>
<td>ol5_uN_i386_patch</td>
<td>Updated packages published after release of Oracle Linux 5 Update N.</td>
</tr>
</tbody>
</table>

The following table shows a selection of the channels that are available for Oracle Linux 5 on the x86_64 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>el5_ga_x86_64_base</td>
<td>All packages released for Oracle Linux 5 GA. This channel does not include errata.</td>
</tr>
<tr>
<td>el5_x86_64_addons</td>
<td>Oracle Linux 5 add ons.</td>
</tr>
<tr>
<td>el5_x86_64_oracle</td>
<td>Oracle Software for Oracle Linux 5.</td>
</tr>
<tr>
<td>ol5_x86_64_ksplice</td>
<td>Oracle Ksplice clients, updates, and dependencies for Oracle Linux 5. Note that access to this channel requires an Oracle Linux Premier Support account.</td>
</tr>
</tbody>
</table>
The following table shows a selection of the channels that are available for Oracle Linux 5 on the IA64 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ol5_x86_64_latest</td>
<td>All packages released for Oracle Linux 5 including the latest errata packages.</td>
</tr>
<tr>
<td>ol5_x86_64_UEK_latest</td>
<td>Latest packages for Unbreakable Enterprise Kernel Release 2 for Oracle Linux 5.</td>
</tr>
<tr>
<td>ol5_uN_x86_64_base</td>
<td>All packages released on the Oracle Linux 5 Update N installation media. This channel does not contain updates.</td>
</tr>
<tr>
<td>ol5_uN_x86_64_patch</td>
<td>Updated packages published after release of Oracle Linux 5 Update N.</td>
</tr>
</tbody>
</table>

Channels that are not available for IA64 include:

- All packages released for Oracle Linux 5 GA.
- Oracle Ksplice clients, updates, and dependencies for Oracle Linux 5.
- Oracle Linux 5 add ons.
- Oracle Software for Oracle Linux 5.

A.2 Oracle Linux 6 Channels

Note

No IA64 channels are available for Oracle Linux 6.

The following table shows a selection of the channels that are available for Oracle Linux 6 on the i386 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ol6_ga_i386_base</td>
<td>All packages released for Oracle Linux 6 GA. This channel does not include errata.</td>
</tr>
<tr>
<td>ol6_i386_addons</td>
<td>Oracle Linux 6 add ons.</td>
</tr>
<tr>
<td>ol6_i386_ksplice</td>
<td>Oracle Ksplice clients, updates, and dependencies for Oracle Linux 6. Note that access to this channel requires an Oracle Linux Premier Support account.</td>
</tr>
<tr>
<td>ol6_i386_latest</td>
<td>All packages released for Oracle Linux 6 including the latest errata packages.</td>
</tr>
</tbody>
</table>
### Oracle Linux 7 Channels

The following table shows a selection of the channels that are available for Oracle Linux 7 on the x86_64 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ol7_x86_64_u0_base</td>
<td>All packages released for Oracle Linux 7 GA (Update 0). This channel does not include errata.</td>
</tr>
<tr>
<td>ol7_x86_64_addons</td>
<td>Oracle Linux 7 add ons.</td>
</tr>
</tbody>
</table>

### A.3 Oracle Linux 7 Channels

**Note**

No i386 or IA64 channels are available for Oracle Linux 7.

The following table shows a selection of the channels that are available for Oracle Linux 7 on the x86_64 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ol7_x86_64_u0_base</td>
<td>All packages released for Oracle Linux 7 GA (Update 0). This channel does not include errata.</td>
</tr>
<tr>
<td>ol7_x86_64_addons</td>
<td>Oracle Linux 7 add ons.</td>
</tr>
</tbody>
</table>
### Oracle VM 2.1 Channels

The following table shows a selection of the channels that are available for Oracle VM 2.1 on the i386 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>o17_x86_64_Dtrace_userspace</td>
<td>Latest DTrace user-space tools for Oracle Linux 7 with Unbreakable Enterprise Kernel Release 3.</td>
</tr>
<tr>
<td>o17_x86_64_kspliace</td>
<td>Oracle Ksplice clients, updates, and dependencies for Oracle Linux 7. Note that access to this channel requires an Oracle Linux Premier Support account.</td>
</tr>
<tr>
<td>o17_x86_64_latest</td>
<td>All packages released for Oracle Linux 7 including the latest errata packages.</td>
</tr>
<tr>
<td>o17_x86_64_optional</td>
<td>All optional packages for Oracle Linux 7 including the latest errata packages.</td>
</tr>
<tr>
<td>o17_x86_64_UEKR3</td>
<td>Latest packages for Unbreakable Enterprise Kernel Release 3 for Oracle Linux 7.</td>
</tr>
<tr>
<td>o17_x86_64_uN_base</td>
<td>All packages released on the Oracle Linux 7 Update N installation media. This channel does not contain updates.</td>
</tr>
<tr>
<td>o17_x86_64_uN_patch</td>
<td>Updated packages published after release of Oracle Linux 7 Update N.</td>
</tr>
</tbody>
</table>

### A.4 Oracle VM 2.1 Channels

The following table shows a selection of the channels that are available for Oracle VM 2.1 on the i386 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ovm2_i386_latest</td>
<td>All packages released for Oracle VM 2, including the very latest updated packages.</td>
</tr>
<tr>
<td>ovm2_2.M.N_i386_base</td>
<td>All packages released on the Oracle VM 2.M.N Server installation media.</td>
</tr>
</tbody>
</table>

### A.5 Oracle VM 2.2 Channels

The following table shows a selection of the channels that are available for Oracle VM 2.2 on the i386 architecture.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ovm22_i386_latest</td>
<td>All packages released for Oracle VM 2.2, including the very latest updated packages.</td>
</tr>
<tr>
<td>ovm22_i386_oracle</td>
<td>Oracle Software for Oracle VM Server 2.2.</td>
</tr>
</tbody>
</table>

### A.6 Oracle VM 3 Channels

The following table shows a selection of the channels that are available for Oracle VM 3 on the x86_64 architecture.
<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ovm3_x86_64_latest</td>
<td>All packages released for Oracle VM 3, including the very latest updated packages.</td>
</tr>
</tbody>
</table>