



# OpenShift Enterprise

## 2

### 2.1 Release Notes

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Release Notes for OpenShift Enterprise

Red Hat OpenShift Documentation  
Team



# OpenShift Enterprise 2 2.1 Release Notes

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## Release Notes for OpenShift Enterprise

Red Hat OpenShift Documentation Team

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## Abstract

The OpenShift Enterprise 2.1 Release Notes summarize all new features, major corrections from the previous version, and any known bugs upon general availability. Instructions are also included to help OpenShift Enterprise administrators to install and configure asynchronous updates to existing installations.

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## Chapter 1. Introduction to OpenShift Enterprise

OpenShift Enterprise by Red Hat is a Platform as a Service (PaaS) that provides developers and IT organizations with an auto-scaling, cloud application platform for deploying new applications on secure, scalable resources with minimal configuration and management overhead. OpenShift Enterprise supports a wide selection of programming languages and frameworks, such as Java, Ruby, and PHP. Integrated developer tools, such as Eclipse integration, JBoss Developer Studio, and Jenkins, support the application life cycle.

Built on Red Hat Enterprise Linux, OpenShift Enterprise provides a secure and scalable multi-tenant operating system for today's enterprise-class applications while providing integrated application runtimes and libraries.

OpenShift Enterprise brings the OpenShift PaaS platform to customer data centers, enabling organizations to implement a private PaaS that meets security, privacy, compliance, and governance requirements.

### 1.1. Installing OpenShift Enterprise 2.1

See the current version of the *OpenShift Enterprise Deployment Guide* at <http://access.redhat.com/site/documentation> for instructions on how to deploy OpenShift Enterprise for the first time.

### 1.2. Upgrading to OpenShift Enterprise 2.1

If you have a previous version of an OpenShift Enterprise instance currently installed and would like to upgrade to OpenShift Enterprise 2.1, see the current edition of the *OpenShift Enterprise Deployment Guide* at <https://access.redhat.com/site/documentation>.

## Chapter 2. New Features

### 2.1. What's New in OpenShift Enterprise 2.1

OpenShift Enterprise 2.1 introduces the following new features:

#### New Cartridge Support

OpenShift Enterprise now supports the following cartridges through the use of the Software Collections Library (SCL):

- » PHP 5.4
- » MySQL 5.5

#### Log Management

Administrators can now configure platform components and developer applications to log messages using Syslog. This enables administrators to optionally configure a Syslog implementation to send logs directly to a remote logging server or monitoring solution without having to first write the messages locally to disk. See the *OpenShift Enterprise Administration Guide* and *OpenShift Enterprise User Guide* at <https://access.redhat.com/site/documentation> for more information on log management.

#### Metrics Collection

Metrics including cgroups, cartridge, and application information can now be gathered and published at a configurable interval for all gears on a node host using a Watchman plug-in. Cartridge and application authors may also publish metrics at a schedule of their own choosing, instead of waiting for the plug-in to invoke the metrics action hook. See the *OpenShift Enterprise Administration Guide* at <https://access.redhat.com/site/documentation> for more information on metrics collection.

#### Gear Placement and Extensibility

Administrators can now group nodes into regions and zones, which can represent physical geographies, such as different countries or data centers, or can be used to provide network level separation between node environments. This feature allows brokers to manage several distinct geographies by controlling application deployments across a selected group of nodes. The broker attempts to distribute new gears evenly across the available zones; if the default gear placement algorithm is not desired, a custom gear placement plug-in can be implemented. See the *OpenShift Enterprise Administration Guide* at <https://access.redhat.com/site/documentation> for more information on regions, zones, and customizing the gear placement algorithm.

#### Teams and LDAP Integration

Developers and administrators can now create and manage teams, which can be added to domains as collaborators. Multiple developers can be added to a team, which counts as a single member with either **view**, **edit**, or **admin** permissions when added to a domain. Teams are controlled by developers, whereas global teams are controlled by system administrators. Global teams can also be synced with LDAP groups, and optionally create OpenShift Enterprise accounts for any LDAP users that do not already exist. See the *OpenShift Enterprise Administration Guide* and *OpenShift Enterprise User Guide* at <https://access.redhat.com/site/documentation> for more information on teams, including global teams.

#### Watchman

Administrators can now configure Watchman, an optional tool that monitors the state of gears and cartridges. It is primarily used to automatically take action to restore any gears that have ceased to function to their most

recent configuration. Plug-ins can be used to expand the events and conditions on which the Watchman tool takes action, such as throttling CPU usage and reacting to out-of-memory exceptions from JBoss cartridges. See the *OpenShift Enterprise Administration Guide* at <https://access.redhat.com/site/documentation> for more information on configuring Watchman.

## 2.2. Notable Technical Changes

### New OpenShift Enterprise 2.1 Channels

Distinct channels have been created for OpenShift Enterprise 2.1 for both RHN Classic and Red Hat Subscription Management. See the *OpenShift Enterprise Deployment Guide* for an updated list of channel names and for more information on available repositories.

### Cartridge Management Requirements on Broker

Cartridges are now managed by the broker. Before cartridges can be used in applications, administrators must use the new **oo-admin-ctl-cartridge** command on the broker host to import cartridge manifests from nodes and migrate cartridges to the latest active version. While this step is performed automatically during upgrades to OpenShift Enterprise 2.1 using the **ose-upgrade** tool or initial installations using the installation utility, it must be performed by administrators after initial installations using the installation scripts or the step-by-step installation instructions. It must also be performed after any future cartridge installations or updates. See the latest *OpenShift Enterprise Deployment Guide* for instructions after an initial installation, and the *OpenShift Enterprise Administration Guide* for more detailed usage.

### Districts Required for Application Deployment

Districts are now required before applications can be deployed. While district creation is performed automatically during initial installations of OpenShift Enterprise 2.1 using the installation utility, it must be performed by administrators after initial installations using the installation scripts or the step-by-step installation instructions. It also must be performed after upgrading to OpenShift Enterprise 2.1 using the **ose-upgrade** tool if districts did not already exist prior to the upgrade. See the latest *OpenShift Enterprise Deployment Guide* for basic information on gear profiles and creating districts after an initial installation, and the *OpenShift Enterprise Administration Guide* for more detailed information on capacity planning and districts.

### MCollective 2.4 Upgrade

MCollective is now upgraded to version 2.4 to address a number of bugs. This upgrade includes a number of configuration changes, such as deprecating the **topicprefix** setting, disabling direct addressing, and removing the **registerinterval** setting. See [https://bugzilla.redhat.com/show\\_bug.cgi?id=1079365](https://bugzilla.redhat.com/show_bug.cgi?id=1079365) for more information.

### MCollective Client Logging

To avoid permission errors related to Apache, the MCollective client is now configured to log to the console at log level **warn** instead of writing to a file at log level **debug**. See [https://bugzilla.redhat.com/show\\_bug.cgi?id=963332](https://bugzilla.redhat.com/show_bug.cgi?id=963332) for more information.



## Chapter 3. Known Issues

This chapter highlights known issues in the OpenShift Enterprise 2.1 release.

### [BZ 1097928](#)

When using RHN Classic, the `oo-admin-yum-validator --oo-version 2.1 --fix-all` command does not automatically subscribe a system to the OpenShift Enterprise 2.1 channels, but instead reports the manual steps required. This command is also automatically run during the `ose-upgrade begin` step when upgrading to OpenShift Enterprise 2.1, therefore upgrades using RHN Classic also require manual intervention. After the channels are manually subscribed, running either command again sets the proper `yum` priorities and continues as expected.

### [BZ 1084035](#)

When scaling up a scalable application with a large minimum number of gears, newly-created gears are deleted automatically before the scale up is finished, until the number of gears is the same as before the scale up.

### [BZ 871569](#)

IPv6 is not supported for the 2.1 release, and OpenShift Enterprise has not been tested using IPv6. Some components that may be affected are listed in the bug report.

### [BZ 1029173](#)

If you delete the Jenkins builder gear (from JBoss Developer Studio) and try to rebuild an application, the build fails because the build can not be found. This seems to be caused because Jenkins keeps a list of builders, and upon builder deletion (using REST calls), Jenkins does not get cleaned up.

### [BZ 1029174](#)

Jenkins Server fails to build a re-created application that uses the same name as a previously deleted application. To workaroud this issue, delete the Jenkins job before creating an application using the same name as a deleted application.

## Chapter 4. Asynchronous Errata Updates

Security, bug fix, and enhancement updates for OpenShift Enterprise 2.1 are released as asynchronous errata through the Red Hat Network. All OpenShift Enterprise 2 errata is available on the Red Hat Customer Portal at <https://rhn.redhat.com/errata/rhel6-rhose2-errata.html>. See <https://access.redhat.com/site/support/policy/updates/openshift/> for more information about asynchronous errata.

Red Hat Customer Portal users can enable errata notifications in the account settings for Red Hat Subscription Management (RHSM) or Red Hat Network (RHN) Classic. When errata notifications are enabled, users are notified via email whenever new errata relevant to their registered systems are released.



### Note

Red Hat Customer Portal user accounts must have systems registered and consuming OpenShift Enterprise entitlements for OpenShift Enterprise errata notification emails to generate.

### Additional Update Instructions per Release

The latest [OpenShift Enterprise Deployment Guide](#) provides general instructions on how to apply asynchronous errata updates within a minor release. Some errata have additional instructions specific to that release that must be performed to fully apply the update to a host. The general instructions provided in the [OpenShift Enterprise Deployment Guide](#) reference [Table 4.1, “Additional Update Instructions per Release”](#) in this section, which details the releases that require additional steps.

Running the **yum update** command on a host installs packages for all pending updates at once. If you are applying multiple asynchronous errata updates at once, any additional update instructions for all releases being installed must be performed. However, the steps can be aggregated in this situation when commands would be unnecessarily repeated. When evaluating which additional steps must be performed for multiple pending asynchronous errata updates, consider the following general workflow:

1. Run the **yum update** command on each host.
2. Restart relevant services.
3. Import, activate, and migrate the latest cartridge manifests on the broker host, if relevant.
4. Run the **oo-admin-upgrade** command on the broker host to upgrade existing gears, if relevant.

[Table 4.1, “Additional Update Instructions per Release”](#) details whether certain parts of the above workflow are relevant to the errata updates you are applying.

#### Example 4.1. Applying Multiple Asynchronous Errata Updates at Once

For example, if you are updating an OpenShift Enterprise release 2.1.3 deployment to release 2.1.5, see [Table 4.1, “Additional Update Instructions per Release”](#) and read through the additional instructions for releases 2.1.4 and 2.1.5. The instructions listed for these two releases can be aggregated into the following steps:

1. After running the **yum update** command on each host, run the following on each node host:

```
# service ruby193-mcollective restart
# service openshift-watchman restart
```

2. Run the following on the broker host:

```
# service openshift-broker restart
# service openshift-console restart
# oo-admin-ctl-cartridge -c import-node --activate --obsolete
# oo-admin-ctl-cartridge -c migrate
# oo-admin-upgrade archive
# oo-admin-upgrade upgrade-node --version=2.1.5
```

Note that the **oo-admin-upgrade upgrade-node** command is only run once, using the version for the latest release being applied.

**Table 4.1. Additional Update Instructions per Release**

Release	Advisory	Additional Instructions
2.1.1	<a href="#">RHBA-2014:0600</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>On the broker host, restart the broker service and, if installed, the console service:</p> <pre># service openshift-broker restart # service openshift-console restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-node --activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.1</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node --version=2.1.1</pre>

Release	Advisory	Additional Instructions
2.1.2	<a href="#">RHBA-2014:0781</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, further steps are required to apply the bug fix for <a href="#">BZ#1102325</a> to existing gears. If you have changed the front-end server proxy plug-in on any node host from the default to the <b>apache-vhost</b> plug-in, you must rebuild the HTTP front-end configuration for those hosts. Note that this causes a node outage, and Red Hat recommends rebuilding during a planned broker maintenance outage.</p> <p>Run the following commands on affected node hosts to rebuild the HTTP front-end configuration:</p> <pre># oo-frontend-plugin-modify --save &gt; filename # oo-frontend-plugin-modify --delete # oo-frontend-plugin-modify --restore &lt; filename</pre> <p>See the <a href="#">OpenShift Enterprise Administration Guide</a> for instructions on enabling maintenance mode and the <a href="#">OpenShift Enterprise Deployment Guide</a> for full documentation on front-end proxy server plug-ins including modifying their configuration.</p>

Release	Advisory	Additional Instructions
2.1.3	<a href="#">RHBA-2014:0878</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>If Rsyslog 7 is installed, restart the <b>rsyslog7</b> service on each node host:</p> <pre># service rsyslog7 restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-node --activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.3</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node --version=2.1.3</pre>

Release	Advisory	Additional Instructions
2.1.4	<a href="#">RHBA-2014:0999</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> and <b>openshift-watchman</b> services on each node host:</p> <pre># service ruby193-mcollective restart # service openshift-watchman restart</pre> <p>On the broker host, restart the broker service and, if installed, the console service:</p> <pre># service openshift-broker restart # service openshift-console restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-node -- activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.4</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.4</pre>

Release	Advisory	Additional Instructions
2.1.5	<a href="#">RHBA-2014:1095</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> and <b>openshift-watchman</b> services on each node host:</p> <pre># service ruby193-mcollective restart # service openshift-watchman restart</pre> <p>On the broker host, restart the broker service and, if installed, the console service:</p> <pre># service openshift-broker restart # service openshift-console restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-node -- activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.5</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.5</pre>
2.1.6	<a href="#">RHBA-2014:1183</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, add the following settings to the <b>/opt/rh/ruby193/root/etc/mcollective/client.cfg</b> file on the broker host:</p> <pre># Broker will retry ActiveMQ connection, then report error plugin.activemq.initial_reconnect_delay = 0.1 plugin.activemq.max_reconnect_attempts = 6</pre> <p>Add the following settings to the <b>/opt/rh/ruby193/root/etc/mcollective/server.cfg</b> file on each node host:</p> <pre># Node should retry connecting to ActiveMQ forever plugin.activemq.max_reconnect_attempts = 0</pre>

Release	Advisory	Additional Instructions
		<pre> plugin.activemq.initial_reconnect_delay = 0.1 plugin.activemq.max_reconnect_delay = 4.0 </pre> <p>On each node host, restart the <b>ruby193-mcollective</b> and <b>openshift-watchman</b> services:</p> <pre> # service ruby193-mcollective restart # service openshift-watchman restart </pre> <p>On the broker host, restart the broker service:</p> <pre> # service openshift-broker restart </pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre> # oo-admin-ctl-cartridge -c import-profile - -activate --obsolete # oo-admin-ctl-cartridge -c migrate </pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.6</b> as the target <b>--version</b>.</p> <pre> # oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.6 </pre> <p>To apply the bug fix for <a href="#">BZ#1135062</a> to existing gears that include MongoDB cartridges, see <a href="https://access.redhat.com/articles/1179613">https://access.redhat.com/articles/1179613</a>.</p>



Release	Advisory	Additional Instructions
2.1.7	<a href="#">RHBA-2014:1353</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>On the broker host, restart the broker service:</p> <pre># service openshift-broker restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-profile - -activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.7</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.7</pre>

Release	Advisory	Additional Instructions
	<a href="#">RHBA-2014:1630</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-profile - -activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.7</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.7</pre>

Release	Advisory	Additional Instructions
	<a href="#">RHBA-2014:1656</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-profile - -activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.7</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node -- version=2.1.7</pre>
	<a href="#">RHEA-2014:1716</a>	See the <a href="#">OpenShift Enterprise Deployment Guide</a> for information on the new JBoss Fuse, JBoss A-MQ, and JBoss Fuse Builder cartridges.
2.1.8	<a href="#">RHEA-2014:1807</a>	After running the <b>yum update</b> command on each host and ensuring all packages have been updated, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for instructions on upgrading from OpenShift Enterprise release 2.1 to release 2.2.

Release	Advisory	Additional Instructions
2.1.9	<a href="#">RHSA-2014:1906</a>	<p>After running the <b>yum update</b> command on each host and ensuring all packages have been updated, restart the <b>ruby193-mcollective</b> service on each node host:</p> <pre># service ruby193-mcollective restart</pre> <p>On the broker host, import and activate the latest cartridge manifests, then migrate old cartridge versions to the latest active versions. Note that this may also activate cartridges that you have previously deactivated, so you may need to again deactivate any cartridges that you want to remain deactivated.</p> <pre># oo-admin-ctl-cartridge -c import-profile -activate --obsolete # oo-admin-ctl-cartridge -c migrate</pre> <p>On the broker host, archive previous upgrade data and upgrade all nodes. Alternatively, to only upgrade a single node or gear, see the <a href="#">OpenShift Enterprise Deployment Guide</a> for other <b>oo-admin-upgrade</b> command usage and use <b>2.1.9</b> as the target <b>--version</b>.</p> <pre># oo-admin-upgrade archive # oo-admin-upgrade upgrade-node --version=2.1.9</pre>
2.1.10	<a href="#">RHBA-2015:0078</a>	After running the <b>yum update</b> command on each host and ensuring all packages have been updated, there are no additional update instructions for this release.
2.1.11	<a href="#">RHBA-2015:1589</a>	After running the <b>yum update</b> command on each host and ensuring all packages have been updated, there are no additional update instructions for this release.
2.1.12	<a href="#">RHEA-2015:1590</a>	After running the <b>yum update</b> command on each host and ensuring all packages have been updated, there are no additional update instructions for this release.

## Chapter 5. Product Support and Documentation

### Product Support

Product support is available at <http://www.redhat.com/support>.

### Product Documentation

Product documentation for OpenShift Enterprise is available at [https://access.redhat.com/knowledge/docs/OpenShift\\_Enterprise/](https://access.redhat.com/knowledge/docs/OpenShift_Enterprise/).

## Appendix A. Revision History

<b>Revision 2.0-16</b>	<b>Tue Aug 11 2015</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2015:0078</a> , <a href="#">RHBA-2015:1581</a> and <a href="#">RHEA-2015:1590</a> .		
<b>Revision 2.0-15</b>	<b>Tue Nov 25 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHSA-2014:1906</a> .		
<b>Revision 2.0-14</b>	<b>Thu Nov 6 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHEA-2014:1807</a> .		
<b>Revision 2.0-13</b>	<b>Thu Oct 23 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHEA-2014:1716</a> .		
<b>Revision 2.0-12</b>	<b>Thu Oct 16 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:1656</a> .		
<b>Revision 2.0-11</b>	<b>Wed Oct 15 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:1630</a> and notes concerning deactivated cartridges to all relevant steps.		
<b>Revision 2.0-10</b>	<b>Thu Oct 2 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.7 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:1353</a> .		
<b>Revision 2.0-9</b>	<b>Tue Sep 16 2014</b>	<b>Alex Dellapenta</b>
Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> to add steps for BZ 1065048 and a Knowledgebase link for BZ 1135062 to the <a href="#">RHBA-2014:1183</a> instructions.		
<b>Revision 2.0-8</b>	<b>Thu Sep 11 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.6 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:1183</a> . BZ 1133628: Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with information on applying multiple updates at once.		
<b>Revision 2.0-7</b>	<b>Tue Aug 26 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.5 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:1095</a> .		
<b>Revision 2.0-6</b>	<b>Mon Aug 4 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.4 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:0999</a> .		
<b>Revision 2.0-4</b>	<b>Mon Jul 14 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.3 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:0878</a> .		
<b>Revision 2.0-3</b>	<b>Mon Jun 23 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.2 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:0781</a> .		

<b>Revision 2.0-2</b>	<b>Wed Jun 4 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1.1 release. Updated <a href="#">Chapter 4, Asynchronous Errata Updates</a> with instructions for <a href="#">RHBA-2014:0600</a> . Updated <a href="#">Section 2.2, "Notable Technical Changes"</a> to note cartridge management and districts requirement starting in release 2.1.		
<b>Revision 2.0-1</b>	<b>Fri May 16 2014</b>	<b>Alex Dellapenta</b>
OpenShift Enterprise 2.1 release.		