OpenShift Container Platform 4.2

Updating clusters

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Abstract

This document provides instructions for updating, or upgrading, OpenShift Container Platform 4.2 clusters. In version 4.2, updating your cluster is a simple process that does not require you to take your cluster offline.
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CHAPTER 1. UPDATING A CLUSTER BETWEEN MINOR VERSIONS

You can update, or upgrade, an OpenShift Container Platform cluster between minor versions.

NOTE

Because of the difficulty of changing update channels by using oc, use the web console to change the update channel. It is recommended to complete the update process within the web console. You can follow the steps in Updating a cluster within a minor version by using the CLI to complete the update after you change to a 4.2 channel.

Prerequisites

- Have access to the cluster as a user with admin privileges. See Using RBAC to define and apply permissions.
- Have a recent etcd backup in case your upgrade fails and you must restore your cluster to a previous state.

IMPORTANT

Using the unsupportedConfigOverrides section to modify an Operator’s configuration is unsupported and might block cluster upgrades. You must remove this setting before you can upgrade your cluster.

1.1. ABOUT THE OPENSIFT CONTAINER PLATFORM UPDATE SERVICE

The OpenShift Container Platform update service is the hosted service that provides over-the-air updates to both OpenShift Container Platform and Red Hat Enterprise Linux CoreOS (RHCOS). It provides a graph, or diagram that contain vertices and the edges that connect them, of component Operators. The edges in the graph show which versions you can safely update to, and the vertices are update payloads that specify the intended state of the managed cluster components.

The Cluster Version Operator (CVO) in your cluster checks with the OpenShift Container Platform update service to see the valid updates and update paths based on current component versions and information in the graph. When you request an update, the OpenShift Container Platform CVO uses the release image for that update to upgrade your cluster. The release artifacts are hosted in Quay as container images.

To allow the OpenShift Container Platform update service to provide only compatible updates, a release verification pipeline exists to drive automation. Each release artifact is verified for compatibility with supported cloud platforms and system architectures as well as other component packages. After the pipeline confirms the suitability of a release, the OpenShift Container Platform update service notifies you that it is available.

IMPORTANT

Because the update service displays all valid updates, you must not force an update to a version that the update service does not display.

During continuous update mode, two controllers run. One continuously updates the payload manifests,
applies them to the cluster, and outputs the status of the controlled rollout of the Operators, whether
they are available, upgrading, or failed. The second controller polls the OpenShift Container Platform
update service to determine if updates are available.

**IMPORTANT**

Reverting your cluster to a previous version, or a rollback, is not supported. Only
upgrading to a newer version is supported.

Additional resources

- Support policy for unmanaged Operators

### 1.2. OPENSHIFT CONTAINER PLATFORM UPGRADE CHANNELS AND RELEASES

In OpenShift Container Platform 4.1, Red Hat introduced the concept of channels for recommending
the appropriate release versions for cluster upgrade. By controlling the pace of upgrades, these upgrade
channels allow you to choose an upgrade strategy. Upgrade channels are tied to a minor version of
OpenShift Container Platform. For instance, OpenShift Container Platform 4.2 upgrade channels will
never include an upgrade to a 4.3 release. This strategy ensures that administrators explicitly decide to
upgrade to the next minor version of OpenShift Container Platform. Upgrade channels control only
release selection and do not impact the version of the cluster that you install; the openshift-install
binary file for a specific version of OpenShift Container Platform always installs that version.

OpenShift Container Platform 4.2 offers the following upgrade channels:

- **candidate-4.2**
- **fast-4.2**
- **stable-4.2**

**candidate-4.2 channel**

The **candidate-4.2** channel contains candidate builds for a z-stream (4.2.z) release. Release candidates
contain all the features of the product but are not supported. Use release candidate versions to test
feature acceptance and assist in qualifying the next version of OpenShift Container Platform. A release
candidate is any build that is available in the candidate channel, including ones that do not contain `-rc`
in their names. After a version is available in the candidate channel, it goes through more quality checks. If
it meets the quality standard, it is promoted to the **fast-4.2** or **stable-4.2** channels. Because of this
strategy, if a specific release is available in both the **candidate-4.2** channel and in the **fast-4.2** or **stable-
4.2** channels, it is a Red Hat supported version. The **candidate-4.2** channel can include release versions
from which there are no recommended updates in any channel.

You can use the **candidate-4.2** channel to upgrade from a previous minor version of OpenShift
Container Platform.

**NOTE**

Release candidates differ from the nightly builds found on the
https://www.openshift.com/try site. Nightly builds are available for early access to
features, but updating to or from nightly builds is neither recommended nor supported.
Nightly builds are not available in any upgrade channel.
fast-4.2 channel
The fast-4.2 channel is updated with new 4.2 versions as soon as Red Hat declares the given version as a general availability release. As such, these releases are fully supported, are production quality, and have performed well while available as a release candidate in the candidate-4.2 channel from where they were promoted. Some time after a release appears in the fast-4.2 channel, it is added to the stable-4.2 channel. Releases never appear in the stable-4.2 channel before they appear in the fast-4.2 channel.

You can use the fast-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

stable-4.2 channel
While the fast-4.2 channel contains releases as soon as their errata are published, releases are added to the stable-4.2 channel after a delay. During this delay, data is collected from Red Hat SRE teams, Red Hat support services, and pre-production and production environments that participate in connected customer program about the stability of the release.

You can use the stable-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

Upgrade version paths
OpenShift Container Platform maintains an upgrade recommendation service that understands the version of OpenShift Container Platform you have installed as well as the path to take within the channel you choose to get you to the next release. You can imagine seeing the following in the fast-4.2 channel:

- 4.2.0
- 4.2.1
- 4.2.3
- 4.2.4

The service recommends only upgrades that have been tested and have no serious issues. If your cluster is on 4.2.1 and OpenShift Container Platform suggests 4.2.4, then it is safe for you to update from 4.2.1 to 4.2.4. Do not rely on consecutive patch numbers. In this example, 4.2.2 is not, and never was, available in the channel. The update service will not suggest updating to a version of OpenShift Container Platform that contains known vulnerabilities.

Update stability depends on your channel. The presence of an update recommendation in the candidate-4.2 channel does not imply that the update is supported. It means that no serious issues have been found with the update yet, but there might not be significant traffic through the update to suggest stability. The presence of an update recommendation in the fast-4.2 or stable-4.2 channels is a declaration that the update is fully supported while it is in the channel. While releases will never be removed from a channel, update recommendations that exhibit serious issues will be removed from all channels. Updates initiated after the update recommendation has been removed might not be supported.

Red Hat will eventually provide supported update paths from any supported release in the fast-4.2 or stable-4.2 channels to the latest release in 4.2.z, although there can be delays while safe paths away from troubled releases are constructed and verified.

Fast and stable channel use and strategies
The fast-4.2 and stable-4.2 channels present a choice between receiving general availability releases as soon as they are available or allowing Red Hat to control the rollout of those updates. If issues are detected during rollout or at a later time, upgrades to that version might be blocked in both the fast-4.2 and stable-4.2 channels, and a new version might be introduced that becomes the new preferred upgrade target.
Customers can improve this process by configuring pre-production systems on the fast-4.2 channel, configuring production systems on the stable-4.2 channel, and participating in Red Hat’s connected customer program. Red Hat uses this program to observe the impact of updates on your specific hardware and software configurations. Future releases might improve or alter the pace at which updates move from the fast-4.2 to the stable-4.2 channel.

**Restricted network clusters**
If you manage the container images for your OpenShift Container Platform clusters yourself, you must consult the Red Hat errata that is associated with product releases and note any comments that impact upgrades. During upgrade, the user interface might warn you about switching between these versions, so you must ensure that you selected an appropriate version before you bypass those warnings.

**Switching between channels**
Your cluster is still supported if you change from the stable-4.2 channel to the fast-4.2 channel. Although you can switch to the candidate-4.2 channel at any time, some releases in that channel might be unsupported release candidates. You can switch from the candidate-4.2 channel to the fast-4.2 channel if your current release is a general availability release. You can always switch from the fast-4.2 channel to the stable-4.2 channel, although if the current release was recently promoted to fast-4.2 there can be a delay of up to a day for the release to be promoted to stable-4.2. If you change to a channel that does not include your current release, an alert displays and no updates can be recommended, but you can safely change back to your original channel at any point.

### 1.3. UPDATING A CLUSTER BY USING THE WEB CONSOLE

If updates are available, you can update your cluster from the web console.

You can find information about available OpenShift Container Platform advisories and updates in the errata section of the Customer Portal.

**Prerequisites**
- Have access to the web console as a user with admin privileges.

**Procedure**

1. From the web console, click Administration > Cluster Settings and review the contents of the Overview tab.

2. For production clusters, ensure that the CHANNEL is set to the correct channel for your current minor version, such as stable-4.2.

   **IMPORTANT**

   For production clusters, you must subscribe to a stable-* or fast-* channel.

   - If the UPDATE STATUS is not Updates Available, you cannot upgrade your cluster.
   - The DESIRED VERSION indicates the cluster version that your cluster is running or is updating to.

3. Click Updates Available, select the highest available version and click Update. The UPDATE STATUS changes to Updating, and you can review the progress of the Operator upgrades on the Cluster Operators tab.
4. After the update completes and the Cluster Version Operator refreshes the available updates, check if more updates are available in your current channel.

- If updates are available, continue to perform updates in the current channel until you can no longer update.

- If no updates are available, change the CHANNEL to the stable-* or fast-* channel for the next minor version, and update to the version that you want in that channel.

You might need to perform several intermediate updates until you reach the version that you want.
CHAPTER 2. UPDATING A CLUSTER WITHIN A MINOR VERSION FROM THE WEB CONSOLE

You can update, or upgrade, an OpenShift Container Platform cluster by using the web console.

Prerequisites

- Have access to the cluster as a user with admin privileges. See Using RBAC to define and apply permissions.
- Have a recent etcd backup in case your upgrade fails and you must restore your cluster to a previous state.

2.1. ABOUT THE OPENSHIFT CONTAINER PLATFORM UPDATE SERVICE

The OpenShift Container Platform update service is the hosted service that provides over-the-air updates to both OpenShift Container Platform and Red Hat Enterprise Linux CoreOS (RHCOS). It provides a graph, or diagram that contain vertices and the edges that connect them, of component Operators. The edges in the graph show which versions you can safely update to, and the vertices are update payloads that specify the intended state of the managed cluster components.

The Cluster Version Operator (CVO) in your cluster checks with the OpenShift Container Platform update service to see the valid updates and update paths based on current component versions and information in the graph. When you request an update, the OpenShift Container Platform CVO uses the release image for that update to upgrade your cluster. The release artifacts are hosted in Quay as container images.

To allow the OpenShift Container Platform update service to provide only compatible updates, a release verification pipeline exists to drive automation. Each release artifact is verified for compatibility with supported cloud platforms and system architectures as well as other component packages. After the pipeline confirms the suitability of a release, the OpenShift Container Platform update service notifies you that it is available.

**IMPORTANT**

Because the update service displays all valid updates, you must not force an update to a version that the update service does not display.

During continuous update mode, two controllers run. One continuously updates the payload manifests, applies them to the cluster, and outputs the status of the controlled rollout of the Operators, whether they are available, upgrading, or failed. The second controller polls the OpenShift Container Platform update service to determine if updates are available.

**IMPORTANT**

Reverting your cluster to a previous version, or a rollback, is not supported. Only upgrading to a newer version is supported.

Additional resources

- Support policy for unmanaged Operators
2.2. OPENSHIFT CONTAINER PLATFORM UPGRADE CHANNELS AND RELEASES

In OpenShift Container Platform 4.1, Red Hat introduced the concept of channels for recommending the appropriate release versions for cluster upgrade. By controlling the pace of upgrades, these upgrade channels allow you to choose an upgrade strategy. Upgrade channels are tied to a minor version of OpenShift Container Platform. For instance, OpenShift Container Platform 4.2 upgrade channels will never include an upgrade to a 4.3 release. This strategy ensures that administrators explicitly decide to upgrade to the next minor version of OpenShift Container Platform. Upgrade channels control only release selection and do not impact the version of the cluster that you install; the openshift-install binary file for a specific version of OpenShift Container Platform always installs that version.

OpenShift Container Platform 4.2 offers the following upgrade channels:

- candidate-4.2
- fast-4.2
- stable-4.2

**candidate-4.2 channel**
The candidate-4.2 channel contains candidate builds for a z-stream (4.2.z) release. Release candidates contain all the features of the product but are not supported. Use release candidate versions to test feature acceptance and assist in qualifying the next version of OpenShift Container Platform. A release candidate is any build that is available in the candidate channel, including ones that do not contain -rc in their names. After a version is available in the candidate channel, it goes through more quality checks. If it meets the quality standard, it is promoted to the fast-4.2 or stable-4.2 channels. Because of this strategy, if a specific release is available in both the candidate-4.2 channel and in the fast-4.2 or stable-4.2 channels, it is a Red Hat supported version. The candidate-4.2 channel can include release versions from which there are no recommended updates in any channel.

You can use the candidate-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**NOTE**
Release candidates differ from the nightly builds found on the https://www.openshift.com/try site. Nightly builds are available for early access to features, but updating to or from nightly builds is neither recommended nor supported. Nightly builds are not available in any upgrade channel.

**fast-4.2 channel**
The fast-4.2 channel is updated with new 4.2 versions as soon as Red Hat declares the given version as a general availability release. As such, these releases are fully supported, are production quality, and have performed well while available as a release candidate in the candidate-4.2 channel from where they were promoted. Some time after a release appears in the fast-4.2 channel, it is added to the stable-4.2 channel. Releases never appear in the stable-4.2 channel before they appear in the fast-4.2 channel.

You can use the fast-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**stable-4.2 channel**
While the fast-4.2 channel contains releases as soon as their errata are published, releases are added to the stable-4.2 channel after a delay. During this delay, data is collected from Red Hat SRE teams, Red Hat support services, and pre-production and production environments that participate in connected
customer program about the stability of the release.

You can use the stable-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**Upgrade version paths**

OpenShift Container Platform maintains an upgrade recommendation service that understands the version of OpenShift Container Platform you have installed as well as the path to take within the channel you choose to get you to the next release. You can imagine seeing the following in the fast-4.2 channel:

- 4.2.0
- 4.2.1
- 4.2.3
- 4.2.4

The service recommends only upgrades that have been tested and have no serious issues. If your cluster is on 4.2.1 and OpenShift Container Platform suggests 4.2.4, then it is safe for you to update from 4.2.1 to 4.2.4. Do not rely on consecutive patch numbers. In this example, 4.2.2 is not, and never was, available in the channel. The update service will not suggest updating to a version of OpenShift Container Platform that contains known vulnerabilities.

Update stability depends on your channel. The presence of an update recommendation in the candidate-4.2 channel does not imply that the update is supported. It means that no serious issues have been found with the update yet, but there might not be significant traffic through the update to suggest stability. The presence of an update recommendation in the fast-4.2 or stable-4.2 channels is a declaration that the update is fully supported while it is in the channel. While releases will never be removed from a channel, update recommendations that exhibit serious issues will be removed from all channels. Updates initiated after the update recommendation has been removed might not be supported.

Red Hat will eventually provide supported update paths from any supported release in the fast-4.2 or stable-4.2 channels to the latest release in 4.2.z, although there can be delays while safe paths away from troubled releases are constructed and verified.

**Fast and stable channel use and strategies**

The fast-4.2 and stable-4.2 channels present a choice between receiving general availability releases as soon as they are available or allowing Red Hat to control the rollout of those updates. If issues are detected during rollout or at a later time, upgrades to that version might be blocked in both the fast-4.2 and stable-4.2 channels, and a new version might be introduced that becomes the new preferred upgrade target.

Customers can improve this process by configuring pre-production systems on the fast-4.2 channel, configuring production systems on the stable-4.2 channel, and participating in Red Hat's connected customer program. Red Hat uses this program to observe the impact of updates on your specific hardware and software configurations. Future releases might improve or alter the pace at which updates move from the fast-4.2 to the stable-4.2 channel.

**Restricted network clusters**

If you manage the container images for your OpenShift Container Platform clusters yourself, you must consult the Red Hat errata that is associated with product releases and note any comments that impact upgrades. During upgrade, the user interface might warn you about switching between these versions, so you must ensure that you selected an appropriate version before you bypass those warnings.

**Switching between channels**
Your cluster is still supported if you change from the **stable-4.2** channel to the **fast-4.2** channel. Although you can switch to the **candidate-4.2** channel at any time, some releases in that channel might be unsupported release candidates. You can switch from the **candidate-4.2** channel to the **fast-4.2** channel if your current release is a general availability release. You can always switch from the **fast-4.2** channel to the **stable-4.2** channel, although if the current release was recently promoted to **fast-4.2** there can be a delay of up to a day for the release to be promoted to **stable-4.2**. If you change to a channel that does not include your current release, an alert displays and no updates can be recommended, but you can safely change back to your original channel at any point.

### 2.3. UPDATING A CLUSTER BY USING THE WEB CONSOLE

If updates are available, you can update your cluster from the web console.

You can find information about available OpenShift Container Platform advisories and updates in the [errata section](#) of the Customer Portal.

#### Prerequisites

- Have access to the web console as a user with **admin** privileges.

#### Procedure

1. From the web console, click **Administration** > **Cluster Settings** and review the contents of the **Overview** tab.

2. For production clusters, ensure that the **CHANNEL** is set to the correct channel for the version that you want to update to, your current minor version, such as **stable-4.2**.

   **IMPORTANT**

   For production clusters, you must subscribe to a stable-* or fast-* channel.

   - If the **UPDATE STATUS** is not **Updates Available**, you cannot upgrade your cluster.
   - The **DESIRED VERSION** indicates the cluster version that your cluster is running or is updating to.

3. Click **Updates Available**, select a version to update to, the highest available version and click **Update**. The **UPDATE STATUS** changes to **Updating**, and you can review the progress of the Operator upgrades on the **Cluster Operators** tab.

4. After the update completes and the Cluster Version Operator refreshes the available updates, check if more updates are available in your current channel.

   - If updates are available, continue to perform updates in the current channel until you can no longer update.
   - If no updates are available, change the **CHANNEL** to the stable-* or fast-* channel for the next minor version, and update to the version that you want in that channel.

You might need to perform several intermediate updates until you reach the version that you want.
CHAPTER 3. UPDATING A CLUSTER WITHIN A MINOR VERSION BY USING THE CLI

You can update, or upgrade, an OpenShift Container Platform cluster within a minor version by using the OpenShift CLI (oc).

Prerequisites

- Have access to the cluster as a user with admin privileges. See Using RBAC to define and apply permissions.
- Have a recent etcd backup in case your upgrade fails and you must restore your cluster to a previous state.

3.1. ABOUT THE OPENSHIFT CONTAINER PLATFORM UPDATE SERVICE

The OpenShift Container Platform update service is the hosted service that provides over-the-air updates to both OpenShift Container Platform and Red Hat Enterprise Linux CoreOS (RHCOS). It provides a graph, or diagram that contain vertices and the edges that connect them, of component Operators. The edges in the graph show which versions you can safely update to, and the vertices are update payloads that specify the intended state of the managed cluster components.

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IMPORTANT

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During continuous update mode, two controllers run. One continuously updates the payload manifests, applies them to the cluster, and outputs the status of the controlled rollout of the Operators, whether they are available, upgrading, or failed. The second controller polls the OpenShift Container Platform update service to determine if updates are available.

IMPORTANT

Reverting your cluster to a previous version, or a rollback, is not supported. Only upgrading to a newer version is supported.

Additional resources

- Support policy for unmanaged Operators
3.2. OPENSIFT CONTAINER PLATFORM UPGRADE CHANNELS AND RELEASES

In OpenShift Container Platform 4.1, Red Hat introduced the concept of channels for recommending the appropriate release versions for cluster upgrade. By controlling the pace of upgrades, these upgrade channels allow you to choose an upgrade strategy. Upgrade channels are tied to a minor version of OpenShift Container Platform. For instance, OpenShift Container Platform 4.2 upgrade channels will never include an upgrade to a 4.3 release. This strategy ensures that administrators explicitly decide to upgrade to the next minor version of OpenShift Container Platform. Upgrade channels control only release selection and do not impact the version of the cluster that you install; the openshift-install binary file for a specific version of OpenShift Container Platform always installs that version.

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- **fast-4.2**
- **stable-4.2**

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You can use the candidate-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**NOTE**
Release candidates differ from the nightly builds found on the https://www.openshift.com/try site. Nightly builds are available for early access to features, but updating to or from nightly builds is neither recommended nor supported. Nightly builds are not available in any upgrade channel.

**fast-4.2 channel**
The fast-4.2 channel is updated with new 4.2 versions as soon as Red Hat declares the given version as a general availability release. As such, these releases are fully supported, are production quality, and have performed well while available as a release candidate in the candidate-4.2 channel from where they were promoted. Some time after a release appears in the fast-4.2 channel, it is added to the stable-4.2 channel. Releases never appear in the stable-4.2 channel before they appear in the fast-4.2 channel.

You can use the fast-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**stable-4.2 channel**
While the fast-4.2 channel contains releases as soon as their errata are published, releases are added to the stable-4.2 channel after a delay. During this delay, data is collected from Red Hat SRE teams, Red Hat support services, and pre-production and production environments that participate in connected
customer program about the stability of the release.

You can use the stable-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**Upgrade version paths**

OpenShift Container Platform maintains an upgrade recommendation service that understands the version of OpenShift Container Platform you have installed as well as the path to take within the channel you choose to get you to the next release. You can imagine seeing the following in the fast-4.2 channel:

- 4.2.0
- 4.2.1
- 4.2.3
- 4.2.4

The service recommends only upgrades that have been tested and have no serious issues. If your cluster is on 4.2.1 and OpenShift Container Platform suggests 4.2.4, then it is safe for you to update from .4.2.1 to .4.2.4. Do not rely on consecutive patch numbers. In this example, 4.2.2 is not, and never was, available in the channel. The update service will not suggest updating to a version of OpenShift Container Platform that contains known vulnerabilities.

Update stability depends on your channel. The presence of an update recommendation in the candidate-4.2 channel does not imply that the update is supported. It means that no serious issues have been found with the update yet, but there might not be significant traffic through the update to suggest stability. The presence of an update recommendation in the fast-4.2 or stable-4.2 channels is a declaration that the update is fully supported while it is in the channel. While releases will never be removed from a channel, update recommendations that exhibit serious issues will be removed from all channels. Updates initiated after the update recommendation has been removed might not be supported.

Red Hat will eventually provide supported update paths from any supported release in the fast-4.2 or stable-4.2 channels to the latest release in 4.2.z, although there can be delays while safe paths away from troubled releases are constructed and verified.

**Fast and stable channel use and strategies**

The fast-4.2 and stable-4.2 channels present a choice between receiving general availability releases as soon as they are available or allowing Red Hat to control the rollout of those updates. If issues are detected during rollout or at a later time, upgrades to that version might be blocked in both the fast-4.2 and stable-4.2 channels, and a new version might be introduced that becomes the new preferred upgrade target.

Customers can improve this process by configuring pre-production systems on the fast-4.2 channel, configuring production systems on the stable-4.2 channel, and participating in Red Hat’s connected customer program. Red Hat uses this program to observe the impact of updates on your specific hardware and software configurations. Future releases might improve or alter the pace at which updates move from the fast-4.2 to the stable-4.2 channel.

**Restricted network clusters**

If you manage the container images for your OpenShift Container Platform clusters yourself, you must consult the Red Hat errata that is associated with product releases and note any comments that impact upgrades. During upgrade, the user interface might warn you about switching between these versions, so you must ensure that you selected an appropriate version before you bypass those warnings.

**Switching between channels**

Your cluster is still supported if you change from the stable-4.2 channel to the fast-4.2 channel. Although you can switch to the candidate-4.2 channel at any time, some releases in that channel might be unsupported release candidates. You can switch from the candidate-4.2 channel to the fast-4.2 channel if your current release is a general availability release. You can always switch from the fast-4.2 channel to the stable-4.2 channel, although if the current release was recently promoted to fast-4.2 there can be a delay of up to a day for the release to be promoted to stable-4.2. If you change to a channel that does not include your current release, an alert displays and no updates can be recommended, but you can safely change back to your original channel at any point.

3.3. UPDATING A CLUSTER BY USING THE CLI

If updates are available, you can update your cluster by using the OpenShift CLI (oc).

You can find information about available OpenShift Container Platform advisories and updates in the errata section of the Customer Portal.

Prerequisites

- Install the version of the OpenShift Command-line Interface (CLI), commonly known as oc, that matches the version for your updated version.
- Log in to the cluster as user with cluster-admin privileges.
- Install the jq package.

Procedure

1. Ensure that your cluster is available:

   ```
   $ oc get clusterversion
   NAME      VERSION   AVAILABLE   PROGRESSING   SINCE   STATUS
   version   4.2.0     True        False         158m    Cluster version is 4.2.0
   ```

2. Review the current update channel information and confirm that your channel is set to stable-4.2:

   ```
   $ oc get clusterversion -o json | jq ".items[0].spec"
   {
   "channel": "stable-4.2",
   "clusterID": "990f7ab8-109b-4c95-8480-2bd1dec55ff",
   "upstream": "https://api.openshift.com/api/upgrades_info/v1/graph"
   }
   ```

   IMPORTANT

   For production clusters, you must subscribe to a stable-* channel.

3. View the available updates and note the version number of the update that you want to apply:

   ```
   $ oc adm upgrade
   ```
Cluster version is 4.1.0

Updates:

**VERSION IMAGE**
4.1.2   quay.io/openshift-release-dev/ocp-release@sha256:9c5f0df8b192a0d7b46cd5f6a4da2289c155fd5302dec7954f8f06c878160b8b

4. Apply an update:
   - To update to the latest version:
     ```bash
     $ oc adm upgrade --to-latest=true
     ```
   - To update to a specific version:
     ```bash
     $ oc adm upgrade --to=<version>
     ```
     `<version>` is the update version that you obtained from the output of the previous command.

5. Review the status of the Cluster Version Operator:
   ```bash
   $ oc get clusterversion -o json | jq ".items[0].spec"
   ```
   ```json
   { "channel": "stable-4.2", "clusterID": "990f7ab8-109b-4c95-8480-2bd1deec55ff", "desiredUpdate": { "force": false, "image": "quay.io/openshift-release-dev/ocp-release@sha256:9c5f0df8b192a0d7b46cd5f6a4da2289c155fd5302dec7954f8f06c878160b8b", "version": "4.2.1" }, "upstream": "https://api.openshift.com/api/upgrades_info/v1/graph" }
   ```
   If the **version** number in the **desiredUpdate** stanza matches the value that you specified, the update is in progress.

6. Review the cluster version status history to monitor the status of the update. It might take some time for all the objects to finish updating.
   ```bash
   $ oc get clusterversion -o json | jq ".items[0].status.history"
   ```
   ```json
   [ { "completionTime": null, "image": "quay.io/openshift-release-dev/ocp-release@sha256:9c5f0df8b192a0d7b46cd5f6a4da2289c155fd5302dec7954f8f06c878160b8b", "startedTime": "2019-06-19T20:30:50Z", }
   ```
The history contains a list of the most recent versions applied to the cluster. This value is updated when the CVO applies an update. The list is ordered by date, where the newest update is first in the list. Updates in the history have state **Completed** if the rollout completed and **Partial** if the update failed or did not complete.

**IMPORTANT**

If an upgrade fails, the Operator stops and reports the status of the failing component. Rolling your cluster back to a previous version is not supported. If your upgrade fails, contact Red Hat support.

7. After the update completes, you can confirm that the cluster version has updated to the new version:

```
$ oc get clusterversion
```

<table>
<thead>
<tr>
<th>NAME</th>
<th>VERSION</th>
<th>AVAILABLE</th>
<th>PROGRESSING</th>
<th>SINCE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>version</td>
<td>4.1.2</td>
<td>True</td>
<td>False</td>
<td>2m</td>
<td>Cluster version is 4.1.2</td>
</tr>
</tbody>
</table>
CHAPTER 4. UPDATING A CLUSTER THAT INCLUDES RHEL COMPUTE MACHINES

You can update, or upgrade, an OpenShift Container Platform cluster. If your cluster contains Red Hat Enterprise Linux (RHEL) machines, you must perform more steps to update those machines.

Prerequisites

- Have access to the cluster as a user with **admin** privileges. See Using RBAC to define and apply permissions.
- Have a recent **etcd backup** in case your upgrade fails and you must restore your cluster to a previous state.

4.1. ABOUT THE OPENSHIFT CONTAINER PLATFORM UPDATE SERVICE

The OpenShift Container Platform update service is the hosted service that provides over-the-air updates to both OpenShift Container Platform and Red Hat Enterprise Linux CoreOS (RHCOS). It provides a **graph** that contains **vertices** and **edges** that connect them, of component Operators. The edges in the graph show which versions you can safely update to, and the vertices are update payloads that specify the intended state of the managed cluster components.

The Cluster Version Operator (CVO) in your cluster checks with the OpenShift Container Platform update service to see the valid updates and update paths based on current component versions and information in the graph. When you request an update, the OpenShift Container Platform CVO uses the release image for that update to upgrade your cluster. The release artifacts are hosted in Quay as container images.

To allow the OpenShift Container Platform update service to provide only compatible updates, a release verification pipeline exists to drive automation. Each release artifact is verified for compatibility with supported cloud platforms and system architectures as well as other component packages. After the pipeline confirms the suitability of a release, the OpenShift Container Platform update service notifies you that it is available.

**IMPORTANT**

Because the update service displays all valid updates, you must not force an update to a version that the update service does not display.

During continuous update mode, two controllers run. One continuously updates the payload manifests, applies them to the cluster, and outputs the status of the controlled rollout of the Operators, whether they are available, upgrading, or failed. The second controller polls the OpenShift Container Platform update service to determine if updates are available.

**IMPORTANT**

Reverting your cluster to a previous version, or a rollback, is not supported. Only upgrading to a newer version is supported.

Additional resources

- Support policy for unmanaged Operators
4.2. OCP UPGRADE CHANNELS AND RELEASES

In OpenShift Container Platform 4.1, Red Hat introduced the concept of channels for recommending the appropriate release versions for cluster upgrade. By controlling the pace of upgrades, these upgrade channels allow you to choose an upgrade strategy. Upgrade channels are tied to a minor version of OpenShift Container Platform. For instance, OpenShift Container Platform 4.2 upgrade channels will never include an upgrade to a 4.3 release. This strategy ensures that administrators explicitly decide to upgrade to the next minor version of OpenShift Container Platform. Upgrade channels control only release selection and do not impact the version of the cluster that you install; the `openshift-install` binary file for a specific version of OpenShift Container Platform always installs that version.

OpenShift Container Platform 4.2 offers the following upgrade channels:

- **candidate-4.2**
- **fast-4.2**
- **stable-4.2**

**candidate-4.2 channel**
The candidate-4.2 channel contains candidate builds for a z-stream (4.2.z) release. Release candidates contain all the features of the product but are not supported. Use release candidate versions to test feature acceptance and assist in qualifying the next version of OpenShift Container Platform. A release candidate is any build that is available in the candidate channel, including ones that do not contain `-rc` in their names. After a version is available in the candidate channel, it goes through more quality checks. If it meets the quality standard, it is promoted to the fast-4.2 or stable-4.2 channels. Because of this strategy, if a specific release is available in both the candidate-4.2 channel and in the fast-4.2 or stable-4.2 channels, it is a Red Hat supported version. The candidate-4.2 channel can include release versions from which there are no recommended updates in any channel.

You can use the candidate-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**NOTE**
Release candidates differ from the nightly builds found on the [https://www.openshift.com/try](https://www.openshift.com/try) site. Nightly builds are available for early access to features, but updating to or from nightly builds is neither recommended nor supported. Nightly builds are not available in any upgrade channel.

**fast-4.2 channel**
The fast-4.2 channel is updated with new 4.2 versions as soon as Red Hat declares the given version as a general availability release. As such, these releases are fully supported, are production quality, and have performed well while available as a release candidate in the candidate-4.2 channel from where they were promoted. Some time after a release appears in the fast-4.2 channel, it is added to the stable-4.2 channel. Releases never appear in the stable-4.2 channel before they appear in the fast-4.2 channel.

You can use the fast-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**stable-4.2 channel**
While the fast-4.2 channel contains releases as soon as their errata are published, releases are added to the stable-4.2 channel after a delay. During this delay, data is collected from Red Hat SRE teams, Red Hat support services, and pre-production and production environments that participate in connected...
customer program about the stability of the release.

You can use the stable-4.2 channel to upgrade from a previous minor version of OpenShift Container Platform.

**Upgrade version paths**

OpenShift Container Platform maintains an upgrade recommendation service that understands the version of OpenShift Container Platform you have installed as well as the path to take within the channel you choose to get you to the next release. You can imagine seeing the following in the fast-4.2 channel:

- 4.2.0
- 4.2.1
- 4.2.3
- 4.2.4

The service recommends only upgrades that have been tested and have no serious issues. If your cluster is on 4.2.1 and OpenShift Container Platform suggests 4.2.4, then it is safe for you to update from .4.2.1 to .4.2.4. Do not rely on consecutive patch numbers. In this example, 4.2.2 is not, and never was, available in the channel. The update service will not suggest updating to a version of OpenShift Container Platform that contains known vulnerabilities.

Update stability depends on your channel. The presence of an update recommendation in the candidate-4.2 channel does not imply that the update is supported. It means that no serious issues have been found with the update yet, but there might not be significant traffic through the update to suggest stability. The presence of an update recommendation in the fast-4.2 or stable-4.2 channels is a declaration that the update is fully supported while it is in the channel. While releases will never be removed from a channel, update recommendations that exhibit serious issues will be removed from all channels. Updates initiated after the update recommendation has been removed might not be supported.

Red Hat will eventually provide supported update paths from any supported release in the fast-4.2 or stable-4.2 channels to the latest release in 4.2.z, although there can be delays while safe paths away from troubled releases are constructed and verified.

**Fast and stable channel use and strategies**

The fast-4.2 and stable-4.2 channels present a choice between receiving general availability releases as soon as they are available or allowing Red Hat to control the rollout of those updates. If issues are detected during rollout or at a later time, upgrades to that version might be blocked in both the fast-4.2 and stable-4.2 channels, and a new version might be introduced that becomes the new preferred upgrade target.

Customers can improve this process by configuring pre-production systems on the fast-4.2 channel, configuring production systems on the stable-4.2 channel, and participating in Red Hat's connected customer program. Red Hat uses this program to observe the impact of updates on your specific hardware and software configurations. Future releases might improve or alter the pace at which updates move from the fast-4.2 to the stable-4.2 channel.

**Restricted network clusters**

If you manage the container images for your OpenShift Container Platform clusters yourself, you must consult the Red Hat errata that is associated with product releases and note any comments that impact upgrades. During upgrade, the user interface might warn you about switching between these versions, so you must ensure that you selected an appropriate version before you bypass those warnings.

**Switching between channels**
Your cluster is still supported if you change from the stable-4.2 channel to the fast-4.2 channel. Although you can switch to the candidate-4.2 channel at any time, some releases in that channel might be unsupported release candidates. You can switch from the candidate-4.2 channel to the fast-4.2 channel if your current release is a general availability release. You can always switch from the fast-4.2 channel to the stable-4.2 channel, although if the current release was recently promoted to fast-4.2 there can be a delay of up to a day for the release to be promoted to stable-4.2. If you change to a channel that does not include your current release, an alert displays and no updates can be recommended, but you can safely change back to your original channel at any point.

4.3. UPDATING A CLUSTER BY USING THE WEB CONSOLE

If updates are available, you can update your cluster from the web console.

You can find information about available OpenShift Container Platform advisories and updates in the errata section of the Customer Portal.

Prerequisites

- Have access to the web console as a user with admin privileges.

Procedure

1. From the web console, click Administration > Cluster Settings and review the contents of the Overview tab.

2. For production clusters, ensure that the CHANNEL is set to the correct channel for the version that you want to update to, your current minor version, such as stable-4.2.

   IMPORTANT
   
   For production clusters, you must subscribe to a stable-* or fast-* channel.

   - If the UPDATE STATUS is not Updates Available, you cannot upgrade your cluster.

   - The DESIRED VERSION indicates the cluster version that your cluster is running or is updating to.

3. Click Updates Available, select a version to update to, the highest available version and click Update. The UPDATE STATUS changes to Updating, and you can review the progress of the Operator upgrades on the Cluster Operators tab.

4. After the update completes and the Cluster Version Operator refreshes the available updates, check if more updates are available in your current channel.

   - If updates are available, continue to perform updates in the current channel until you can no longer update.

   - If no updates are available, change the CHANNEL to the stable-* or fast-* channel for the next minor version, and update to the version that you want in that channel.

   You might need to perform several intermediate updates until you reach the version that you want.
4.4. (OPTIONAL) ADDING HOOKS TO PERFORM ANSIBLE TASKS ON RHEL MACHINES

You can use hooks to run Ansible tasks on the RHEL compute machines during the OpenShift Container Platform update.

4.4.1. About Ansible hooks for upgrades

When you update OpenShift Container Platform, you can run custom tasks on your Red Hat Enterprise Linux (RHEL) nodes during specific operations by using hooks. Hooks allow you to provide files that define tasks to run before or after specific update tasks. You can use hooks to validate or modify custom infrastructure when you update the RHEL compute nodes in your OpenShift Container Platform cluster.

Because when a hook fails, the operation fails, you must design hooks that are idempotent, or can run multiple times and provide the same results.

Hooks have the following important limitations: - Hooks do not have a defined or versioned interface. They can use internal openshift-ansible variables, but it is possible that the variables will be modified or removed in future OpenShift Container Platform releases. - Hooks do not have error handling, so an error in a hook halts the update process. If you get an error, you must address the problem and then start the upgrade again.

4.4.2. Configuring the Ansible inventory file to use hooks

You define the hooks to use when you update the Red Hat Enterprise Linux (RHEL) compute machines, which are also known as worker machines, in the hosts inventory file under the all:vars section.

Prerequisites

- You have access to the machine that you used to add the RHEL compute machines cluster. You must have access to the hosts Ansible inventory file that defines your RHEL machines.

Procedure

1. After you design the hook, create a YAML file that defines the Ansible tasks for it. This file must be a set of tasks and cannot be a playbook, as shown in the following example:

   ```yaml
   ---
   # Trivial example forcing an operator to acknowledge the start of an upgrade
   # file=/home/user/openshift-ansible/hooks/pre_compute.yml
   - name: note the start of a compute machine update
     debug:
       msg: "Compute machine upgrade of {{ inventory_hostname }} is about to start"
   - name: require the user agree to start an upgrade
     pause:
       prompt: "Press Enter to start the compute machine update"
   ```

2. Modify the hosts Ansible inventory file to specify the hook files. The hook files are specified as parameter values in the [all:vars] section, as shown:

   ```
   Example hook definitions in an inventory file
   ```
To avoid ambiguity in the paths to the hook, use absolute paths instead of a relative paths in their definitions.

### 4.4.3. Available hooks for RHEL compute machines

You can use the following hooks when you update the Red Hat Enterprise Linux (RHEL) compute machines in your OpenShift Container Platform cluster.

<table>
<thead>
<tr>
<th>Hook name</th>
<th>Description</th>
</tr>
</thead>
</table>
| openshift_node_pre_cordon_hook     | - Runs **before** each node is cordoned.  
                                       - This hook runs against **each node** in serial.  
                                       - If a task must run against a different host,  
                                         the task must use `delegate_to` or `local_action`. |
| openshift_node_pre_upgrade_hook    | - Runs **after** each node is cordoned but **before** it is updated.  
                                       - This hook runs against **each node** in serial.  
                                       - If a task must run against a different host,  
                                         the task must use `delegate_to` or `local_action`. |
| openshift_node_pre_uncordon_hook   | - Runs **after** each node is updated but **before** it is uncordoned.  
                                       - This hook runs against **each node** in serial.  
                                       - If a task must run against a different host,  
                                         they task must use `delegate_to` or `local_action`. |
| openshift_node_post_upgrade_hook   | - Runs **after** each node uncordoned. It is the **last** node update action.  
                                       - This hook runs against **each node** in serial.  
                                       - If a task must run against a different host,  
                                         the task must use `delegate_to` or `local_action`. |

### 4.5. UPDATING RHEL COMPUTE MACHINES IN YOUR CLUSTER
After you update your cluster, you must update the Red Hat Enterprise Linux (RHEL) compute machines in your cluster.

**Prerequisites**

- You updated your cluster.

**IMPORTANT**

Because the RHEL machines require assets that are generated by the cluster to complete the update process, you must update the cluster before you update the RHEL compute machines in it.

- You have access to the machine that you used to add the RHEL compute machines cluster. You must have access to the **hosts** Ansible inventory file that defines your RHEL machines and the **upgrade** playbook.

**Procedure**

1. Stop and disable firewalld on the host:

   ```bash
   # systemctl disable --now firewalld.service
   ```

   **NOTE**

   You must not enable firewalld later. If you do, you cannot access OpenShift Container Platform logs on the worker.

2. Enable the repositories that are required for OpenShift Container Platform 4.2:

   a. On the machine that you run the Ansible playbooks, update the required repositories:

   ```bash
   # subscription-manager repos --disable=rhel-7-server-ansible-2.7-rpms \ 
   --disable=rhel-7-server-ose-4.1-rpms \ 
   --enable=rhel-7-server-ansible-2.8-rpms \ 
   --enable=rhel-7-server-ose-4.2-rpms
   ```

   b. On the machine that you run the Ansible playbooks, update the required packages, including **openshift-ansible**:

   ```bash
   # yum update openshift-ansible openshift-clients
   ```

   c. On each RHEL compute node, update the required repositories:

   ```bash
   # subscription-manager repos --disable=rhel-7-server-ose-4.1-rpms \ 
   --enable=rhel-7-server-ose-4.2-rpms
   ```

3. Review your Ansible inventory file at `/<path>/inventory/hosts` and ensure that all of your compute, or worker, machines are listed in the **[workers]** section, as shown in the following example:

   ```
   [all:vars]
   ```
If all of your RHEL compute machines are not listed in the `[workers]` section, you must move them to that section.

4. Change to the *openshift-ansible* directory and run the *upgrade* playbook:

```bash
$ cd /usr/share/ansible/openshift-ansible
$ ansible-playbook -i /<path>/inventory/hosts playbooks/upgrade.yml
```

1. For `<path>`, specify the path to the Ansible inventory file that you created.