OpenShift Dedicated 4

Installing, accessing, and deleting OpenShift Dedicated clusters
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Abstract

This document provides information on how to install OpenShift Dedicated clusters. The document also provides details on how to configure identity providers.
Table of Contents

CHAPTER 1. CREATING A CLUSTER ON AWS ................................................................. 3
  1.1. PREREQUISITES 3
  1.2. CREATING A CLUSTER ON AWS WITH CCS 3
  1.3. CREATING A CLUSTER ON AWS WITH A RED HAT CLOUD ACCOUNT 8
  1.4. ADDITIONAL RESOURCES 11

CHAPTER 2. CREATING A CLUSTER ON GCP ......................................................... 13
  2.1. PREREQUISITES 13
  2.2. CREATING A CLUSTER ON GCP WITH CCS 13
  2.3. CREATING A CLUSTER ON GCP WITH GOOGLE CLOUD MARKETPLACE 19
  2.4. CREATING A CLUSTER ON GCP WITH A RED HAT CLOUD ACCOUNT 24
  2.5. CREATING A CLUSTER ON GCP WITH RED HAT MARKETPLACE 27
  2.6. ADDITIONAL RESOURCES 32

CHAPTER 3. CONFIGURING IDENTITY PROVIDERS ............................................. 33
  3.1. UNDERSTANDING IDENTITY PROVIDERS 33
    3.1.1. Supported identity providers 33
    3.1.2. Identity provider parameters 33
  3.2. CONFIGURING A GITHUB IDENTITY PROVIDER 34
  3.3. CONFIGURING A GITLAB IDENTITY PROVIDER 35
  3.4. CONFIGURING A GOOGLE IDENTITY PROVIDER 37
  3.5. CONFIGURING A LDAP IDENTITY PROVIDER 38
  3.6. CONFIGURING AN OPENID IDENTITY PROVIDER 39
  3.7. CONFIGURING AN HTPASSWD IDENTITY PROVIDER 41
  3.8. ACCESSING YOUR CLUSTER 42

CHAPTER 4. REVOKING PRIVILEGES AND ACCESS TO AN OPENSOURCE DEDICATED CLUSTER .......... 44
  4.1. REVOKING ADMINISTRATOR PRIVILEGES FROM A USER 44
  4.2. REVOKING USER ACCESS TO A CLUSTER 44

CHAPTER 5. DELETING AN OPENSOURCE DEDICATED CLUSTER ................................... 46
  5.1. DELETING YOUR CLUSTER 46
CHAPTER 1. CREATING A CLUSTER ON AWS

You can install OpenShift Dedicated on Amazon Web Services (AWS) by using your own AWS account through the Customer Cloud Subscription (CCS) model or by using an AWS infrastructure account that is owned by Red Hat.

1.1. PREREQUISITES

- You reviewed the introduction to OpenShift Dedicated and the documentation on architecture concepts.
- You reviewed the OpenShift Dedicated cloud deployment options.

1.2. CREATING A CLUSTER ON AWS WITH CCS

By using the Customer Cloud Subscription (CCS) billing model, you can create an OpenShift Dedicated cluster in an existing Amazon Web Services (AWS) account that you own.

You must meet several prerequisites if you use the CCS model to deploy and manage OpenShift Dedicated into your AWS account.

Prerequisites

- You have configured your AWS account for use with OpenShift Dedicated.
- You have not deployed any services in your AWS account.
- You have configured the AWS account quotas and limits that are required to support the desired cluster size.
- You have an osdCcsAdmin AWS Identity and Access Management (IAM) user with the AdministratorAccess policy attached.
- You have set up a service control policy (SCP) in your AWS organization. For more information, see Minimum required service control policy (SCP).
- Consider having Business Support or higher from AWS.
- If you are configuring a cluster-wide proxy, you have verified that the proxy is accessible from the VPC that the cluster is being installed into. The proxy must also be accessible from the private subnets of the VPC.

Procedure

1. Log in to OpenShift Cluster Manager and click Create cluster.

2. On the Create an OpenShift cluster page, select Create cluster in the Red Hat OpenShift Dedicated row.

3. Under Billing model, configure the subscription type and infrastructure type:
   a. Select a subscription type. For information about OpenShift Dedicated subscription options, see Cluster subscriptions and registration in the OpenShift Cluster Manager documentation.
The subscription types that are available to you depend on your OpenShift Dedicated subscriptions and resource quotas. For more information, contact your sales representative or Red Hat support.

b. Select the **Customer Cloud Subscription** infrastructure type to deploy OpenShift Dedicated in an existing cloud provider account that you own.

c. Click **Next**.

4. Select **Run on Amazon Web Services**.

5. After selecting your cloud provider, review and complete the listed **Prerequisites**. Select the checkbox to acknowledge that you have read and completed all of the prerequisites.

6. Provide your AWS account details:

   a. Enter your **AWS account ID**.

   b. Enter your **AWS access key ID** and **AWS secret access key** for your AWS IAM user account.

      **NOTE**

      Revoking these credentials in AWS results in a loss of access to any cluster created with these credentials.

   c. Optional: You can select **Bypass AWS service control policy (SCP) checks** to disable the SCP checks.

      **NOTE**

      Some AWS SCPs can cause the installation to fail, even if you have the required permissions. Disabling the SCP checks allows an installation to proceed. The SCP is still enforced even if the checks are bypassed.

7. Click **Next** to validate your cloud provider account and go to the **Cluster details** page.

8. On the **Cluster details** page, provide a name for your cluster and specify the cluster details:

   a. Add a **Cluster name**.

   b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string.

      To customize the subdomain, select the **Create customize domain prefix** checkbox, and enter your domain prefix name in the **Domain prefix** field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.

   c. Select a cluster version from the **Version** drop-down menu.

   d. Select a cloud provider region from the **Region** drop-down menu.
e. Select a **Single zone** or **Multi-zone** configuration.

f. Leave **Enable user workload monitoring** selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

g. Optional: Select **Enable additional etcd encryption** if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

**NOTE**

By enabling etcd encryption for the key values in etcd, you will incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

h. Optional: Select **Encrypt persistent volumes with customer keys** if you want to provide your own AWS Key Management Service (KMS) key Amazon Resource Name (ARN). The key is used for encrypting all control plane, infrastructure, worker node root volumes, and persistent volumes in your cluster.

**IMPORTANT**

Only persistent volumes (PVs) created from the default storage class are encrypted with this specific key.

PVs created by using any other storage class are still encrypted, but the PVs are not encrypted with this key unless the storage class is specifically configured to use this key.

i. Click **Next**.

9. On the **Default machine pool** page, select a **Compute node instance type** and a **Compute node count**. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.

**NOTE**

After your cluster is created, you can change the number of compute nodes in your cluster, but you cannot change the compute node instance type in a machine pool. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

10. Choose your preference for the Instance Metadata Service (IMDS) type, either using both IMDSv1 and IMDSv2 types or requiring your EC2 instances to use only IMDSv2. You can access instance metadata from a running instance in two ways:

- **Instance Metadata Service Version 1 (IMDSv1)** - a request/response method
- **Instance Metadata Service Version 2 (IMDSv2)** - a session-oriented method
IMPORTANT

The Instance Metadata Service settings cannot be changed after your cluster is created.

NOTE

IMDSv2 uses session-oriented requests. With session-oriented requests, you create a session token that defines the session duration, which can range from a minimum of one second to a maximum of six hours. During the specified duration, you can use the same session token for subsequent requests. After the specified duration expires, you must create a new session token to use for future requests.

For more information regarding IMDS, see Instance metadata and user data in the AWS documentation.

11. Optional: Expand Edit node labels to add labels to your nodes. Click Add label to add more node labels and select Next.

12. On the Network configuration page, select Public or Private to use either public or private API endpoints and application routes for your cluster.

IMPORTANT

If you are using private API endpoints, you cannot access your cluster until you update the network settings in your cloud provider account.

13. Optional: To install the cluster in an existing AWS Virtual Private Cloud (VPC):

   a. Select Install into an existing VPC

   b. If you are installing into an existing VPC and opted to use private API endpoints, you can select Use a PrivateLink. This option enables connections to the cluster by Red Hat Site Reliability Engineering (SRE) using only AWS PrivateLink endpoints.

      NOTE

      The Use a PrivateLink option cannot be changed after a cluster is created.

   c. If you are installing into an existing VPC and you want to enable an HTTP or HTTPS proxy for your cluster, select Configure a cluster-wide proxy.

14. Click Next.

15. If you opted to install the cluster in an existing AWS VPC, provide your Virtual Private Cloud (VPC) subnet settings and select Next. You must have created the Cloud network address translation (NAT) and a Cloud router. See the “Additional resources” section for information about Cloud NATs and Google VPCs.
NOTE

You must ensure that your VPC is configured with a public and a private subnet for each availability zone that you want the cluster installed into. If you opted to use PrivateLink, only private subnets are required.

a. Optional: Expand Additional security groups and select additional custom security groups to apply to nodes in the machine pools that are created by default. You must have already created the security groups and associated them with the VPC that you selected for this cluster. You cannot add or edit security groups to the default machine pools after you create the cluster.

By default, the security groups you specify are added for all node types. Clear the Apply the same security groups to all node types checkbox to apply different security groups for each node type.

For more information, see the requirements for Security groups under Additional resources.

16. If you opted to configure a cluster-wide proxy, provide your proxy configuration details on the Cluster-wide proxy page:

a. Enter a value in at least one of the following fields:
   - Specify a valid HTTP proxy URL
   - Specify a valid HTTPS proxy URL
   - In the Additional trust bundle field, provide a PEM encoded X.509 certificate bundle. The bundle is added to the trusted certificate store for the cluster nodes. An additional trust bundle file is required unless the identity certificate for the proxy is signed by an authority from the Red Hat Enterprise Linux CoreOS (RHCOS) trust bundle. If you use an MITM transparent proxy network that does not require additional proxy configuration but requires additional certificate authorities (CAs), you must provide the MITM CA certificate.

b. Click Next.

For more information about configuring a proxy with OpenShift Dedicated, see Configuring a cluster-wide proxy.

17. In the CIDR ranges dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

NOTE

If you are installing into a VPC, the Machine CIDR range must match the VPC subnets.

IMPORTANT

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

18. On the Cluster update strategy page, configure your update preferences:

a. Choose a cluster update method:
Select **Individual updates** if you want to schedule each update individually. This is the default option.

Select **Recurring updates** to update your cluster on your preferred day and start time, when updates are available.

**NOTE**
You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see OpenShift Dedicated update life cycle.

b. Provide administrator approval based on your cluster update method:

- **Individual updates:** If you select an update version that requires approval, provide an administrator’s acknowledgment and click Approve and continue.

- **Recurring updates:** If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click Approve and continue. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.

d. Optional: You can set a grace period for **Node draining** during cluster upgrades. A 1 hour grace period is set by default.

e. Click Next.

**NOTE**
In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see Understanding Red Hat security ratings.

19. Review the summary of your selections and click Create cluster to start the cluster installation. The installation takes approximately 30–40 minutes to complete.

**Verification**

- You can monitor the progress of the installation in the Overview page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the Status in the Details section of the page is listed as Ready.

### 1.3. Creating a Cluster on AWS with a Red Hat Cloud Account

Through OpenShift Cluster Manager, you can create an OpenShift Dedicated cluster on Amazon Web Services (AWS) using a standard cloud provider account owned by Red Hat.
Procedure

1. Log in to OpenShift Cluster Manager and click Create cluster.

2. In the Cloud tab, click Create cluster in the Red Hat OpenShift Dedicated row.

3. Under Billing model, configure the subscription type and infrastructure type:
   a. Select the Annual subscription type. Only the Annual subscription type is available when you deploy a cluster using a Red Hat cloud account. For information about OpenShift Dedicated subscription options, see Cluster subscriptions and registration in the OpenShift Cluster Manager documentation.

   NOTE

   You must have the required resource quota for the Annual subscription type to be available. For more information, contact your sales representative or Red Hat support.

   b. Select the Red Hat cloud account infrastructure type to deploy OpenShift Dedicated in a cloud provider account that is owned by Red Hat.

   c. Click Next.

4. Select Run on Amazon Web Services and click Next.

5. On the Cluster details page, provide a name for your cluster and specify the cluster details:
   a. Add a Cluster name.

   b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string. To customize the subdomain, select the Create custom domain prefix checkbox, and enter your domain prefix name in the Domain prefix field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.

   c. Select a cluster version from the Version drop-down menu.

   d. Select a cloud provider region from the Region drop-down menu.

   e. Select a Single zone or Multi-zone configuration.

   f. Select a Persistent storage capacity for the cluster. For more information, see the Storage section in the OpenShift Dedicated service definition.

   g. Specify the number of Load balancers that you require for your cluster. For more information, see the Load balancers section in the OpenShift Dedicated service definition.

   h. Leave Enable user workload monitoring selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

   i. Optional: Select Enable additional etcd encryption if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option
is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

**NOTE**

By enabling etcd encryption for the key values in etcd, you will incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

j. Click Next.

6. On the **Default machine pool** page, select a **Compute node instance type** and a **Compute node count**. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.

**NOTE**

After your cluster is created, you can change the number of compute nodes, but you cannot change the compute node instance type in a machine pool. For clusters that use the CCS model, you can add machine pools after installation that use a different instance type. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

7. Optional: Expand **Edit node labels** to add labels to your nodes. Click **Add label** to add more node labels and select Next.

8. In the **Cluster privacy** dialog, select **Public** or **Private** to use either public or private API endpoints and application routes for your cluster.

9. Click Next.

10. In the **CIDR ranges** dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

**IMPORTANT**

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

If the cluster privacy is set to **Private**, you cannot access your cluster until you configure private connections in your cloud provider.

11. On the **Cluster update strategy** page, configure your update preferences:

a. Choose a cluster update method:

   - Select **Individual updates** if you want to schedule each update individually. This is the default option.

   - Select **Recurring updates** to update your cluster on your preferred day and start time, when updates are available.
NOTE
You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see OpenShift Dedicated update life cycle.

b. Provide administrator approval based on your cluster update method:

- Individual updates: If you select an update version that requires approval, provide an administrator’s acknowledgment and click Approve and continue.

- Recurring updates: If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click Approve and continue. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.

d. Optional: You can set a grace period for Node draining during cluster upgrades. A 1 hour grace period is set by default.

e. Click Next.

NOTE
In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see Understanding Red Hat security ratings.

12. Review the summary of your selections and click Create cluster to start the cluster installation. The installation takes approximately 30–40 minutes to complete.

Verification

- You can monitor the progress of the installation in the Overview page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the Status in the Details section of the page is listed as Ready.

1.4. ADDITIONAL RESOURCES

- For information about configuring a proxy with OpenShift Dedicated, see Configuring a cluster-wide proxy.

- For details about the AWS service control policies required for CCS deployments, see Minimum required service control policy (SCP).

- For information about persistent storage for OpenShift Dedicated, see the Storage section in the OpenShift Dedicated service definition.

- For information about load balancers for OpenShift Dedicated, see the Load balancers section in the OpenShift Dedicated service definition.
• For more information about etcd encryption, see the etcd encryption service definition.

• For information about the end-of-life dates for OpenShift Dedicated versions, see the OpenShift Dedicated update life cycle.

• For information about the requirements for custom additional security groups, see Additional custom security groups.
CHAPTER 2. CREATING A CLUSTER ON GCP

You can install OpenShift Dedicated on Google Cloud Platform (GCP) by using your own GCP account through the Customer Cloud Subscription (CCS) model or by using a GCP infrastructure account that is owned by Red Hat.

2.1. PREREQUISITES

- You reviewed the introduction to OpenShift Dedicated and the documentation on architecture concepts.
- You reviewed the OpenShift Dedicated cloud deployment options.

2.2. CREATING A CLUSTER ON GCP WITH CCS

By using the Customer Cloud Subscription (CCS) billing model, you can create an OpenShift Dedicated cluster in an existing Google Cloud Platform (GCP) account that you own.

You must meet several prerequisites if you use the CCS model to deploy and manage OpenShift Dedicated into your GCP account.

Prerequisites

- You have configured your GCP account for use with OpenShift Dedicated.
- You have configured the GCP account quotas and limits that are required to support the desired cluster size.
- You have created a GCP project.

  **NOTE**

  The project name must be 10 characters or less.

- You have enabled the Google Cloud Resource Manager API in your GCP project. For more information about enabling APIs for your project, see the Google Cloud documentation.

- You have an IAM service account in GCP called osd-ccs-admin with the following roles attached:
  - Compute Admin
  - DNS Administrator
  - Security Admin
  - Service Account Admin
  - Service Account Key Admin
  - Service Account User
  - Organization Policy Viewer
  - Service Management Administrator
- Service Usage Admin
- Storage Admin
- Compute Load Balancer Admin
- Role Viewer
- Role Administrator

- You have created a key for your `osd-ccs-admin` GCP service account and exported it to a file named `osServiceAccount.json`.

**NOTE**

For more information about creating a key for your GCP service account and exporting it to a JSON file, see Creating service account keys in the Google Cloud documentation.

- Consider having Production Support or higher from GCP.

- To prevent potential conflicts, consider having no other resources provisioned in the project prior to installing OpenShift Dedicated.

- If you are configuring a cluster-wide proxy, you have verified that the proxy is accessible from the VPC that the cluster is being installed into.

**Procedure**

1. Log in to OpenShift Cluster Manager and click Create cluster.

2. On the Create an OpenShift cluster page, select Create cluster in the Red Hat OpenShift Dedicated row.

3. Under Billing model, configure the subscription type and infrastructure type:
   - a. Select a subscription type. For information about OpenShift Dedicated subscription options, see Cluster subscriptions and registration in the OpenShift Cluster Manager documentation.

   **NOTE**

   The subscription types that are available to you depend on your OpenShift Dedicated subscriptions and resource quotas. For more information, contact your sales representative or Red Hat support.

   b. Select the Customer Cloud Subscription infrastructure type to deploy OpenShift Dedicated in an existing cloud provider account that you own.

   c. Click Next.

4. Select Run on Google Cloud Platform

5. After selecting your cloud provider, review and complete the listed Prerequisites. Select the checkbox to acknowledge that you have read and completed all of the prerequisites.
6. Provide your GCP service account private key in JSON format. You can either click **Browse** to locate and attach a JSON file or add the details in the **Service account JSON** field.

7. Click **Next** to validate your cloud provider account and go to the **Cluster details** page.

8. On the **Cluster details** page, provide a name for your cluster and specify the cluster details:
   a. Add a **Cluster name**.
   b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string. To customize the subdomain, select the **Create customize domain prefix** checkbox, and enter your domain prefix name in the **Domain prefix** field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.
   c. Select a cluster version from the **Version** drop-down menu.
   d. Select a cloud provider region from the **Region** drop-down menu.
   e. Select a **Single zone** or **Multi-zone** configuration.
   f. Optional: Select **Enable Secure Boot for Shielded VMs** to use Shielded VMs when installing your cluster. For more information, see **Shielded VMs**.

   ![IMPORTANT](image)

   **IMPORTANT**

   To successfully create a cluster, you must select **Enable Secure Boot support for Shielded VMs** if your organization has the policy constraint constraints/compute.requireShieldedVm enabled. For more information regarding GCP organizational policy constraints, see **Organization policy constraints**.

   g. Leave **Enable user workload monitoring** selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

9. Optional: Expand **Advanced Encryption** to make changes to encryption settings.
   a. Select **Use Custom KMS keys** to use custom KMS keys. If you prefer not to use custom KMS keys, leave the default setting **Use default KMS Keys**.

   ![IMPORTANT](image)

   **IMPORTANT**

   To use custom KMS keys, the IAM service account osd-ccs-admin must be granted the **Cloud KMS CryptoKey Encrypter/Decrypter** role. For more information about granting roles on a resource, see **Granting roles on a resource**.

   With **Use Custom KMS keys** selected:

   i. Select a key ring location from the **Key ring location** drop-down menu.
   ii. Select a key ring from the **Key ring** drop-down menu.
iii. Select a key name from the **Key name** drop-down menu.

iv. Provide the **KMS Service Account**

b. Optional: Select **Enable additional etcd encryption** if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

**NOTE**

By enabling etcd encryption for the key values in etcd, you will incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

c. Optional: Select **Enable FIPS cryptography** if you require your cluster to be FIPS validated.

d. Click **Next**.

10. On the **Default machine pool** page, select a **Compute node instance type** and a **Compute node count**. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.

**NOTE**

After your cluster is created, you can change the number of compute nodes in your cluster, but you cannot change the compute node instance type in a machine pool. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

11. Optional: Expand **Edit node labels** to add labels to your nodes. Click **Add label** to add more node labels and select **Next**.

12. On the **Network configuration** page, select **Public** or **Private** to use either public or private API endpoints and application routes for your cluster.

**IMPORTANT**

If you are using private API endpoints, you cannot access your cluster until you update the network settings in your cloud provider account.

13. Optional: To install the cluster in an existing GCP Virtual Private Cloud (VPC):

   a. Select **Install into an existing VPC**

   b. If you are installing into an existing VPC and you want to enable an HTTP or HTTPS proxy for your cluster, select **Configure a cluster-wide proxy**.

14. Click **Next**.

15. Optional: To install the cluster into a GCP Shared VPC:
IMPORTANT

To install a cluster into a Shared VPC, you must use OpenShift Dedicated version 4.13.15 or above. Additionally, the VPC owner of the host project must enable a project as a host project in their Google Cloud console. For more information, see Enable a host project.

a. Select Install into GCP Shared VPC

b. Specify the Host project ID. If the specified host project ID is incorrect, cluster creation fails.

IMPORTANT

Once you complete the steps within the cluster configuration wizard and click Create Cluster, the cluster will go into the "Installation Waiting" state. At this point, you must contact the VPC owner of the host project, who must assign the dynamically-generated service account the following roles: Computer Network Administrator, Compute Security Administrator, and DNS Administrator. The VPC owner of the host project has 30 days to grant the listed permissions before the cluster creation fails. For information about Shared VPC permissions, see Provision Shared VPC.

16. If you opted to install the cluster in an existing GCP VPC, provide your Virtual Private Cloud (VPC) subnet settings and select Next. You must have created the Cloud network address translation (NAT) and a Cloud router. See the "Additional resources" section for information about Cloud NATs and Google VPCs.

NOTE

If you are installing a cluster into a Shared VPC, the VPC name and subnets are shared from the host project.

17. If you opted to configure a cluster-wide proxy, provide your proxy configuration details on the Cluster-wide proxy page:

a. Enter a value in at least one of the following fields:

   - Specify a valid HTTP proxy URL
   - Specify a valid HTTPS proxy URL
   - In the Additional trust bundle field, provide a PEM encoded X.509 certificate bundle. The bundle is added to the trusted certificate store for the cluster nodes. An additional trust bundle file is required unless the identity certificate for the proxy is signed by an authority from the Red Hat Enterprise Linux CoreOS (RHCOS) trust bundle. If you use an MITM transparent proxy network that does not require additional proxy configuration but requires additional certificate authorities (CAs), you must provide the MITM CA certificate.

b. Click Next.

For more information about configuring a proxy with OpenShift Dedicated, see Configuring a cluster-wide proxy.
18. In the **CIDR ranges** dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

**NOTE**

If you are installing into a VPC, the **Machine CIDR** range must match the VPC subnets.

**IMPORTANT**

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

19. On the **Cluster update strategy** page, configure your update preferences:

   a. Choose a cluster update method:

      - Select **Individual updates** if you want to schedule each update individually. This is the default option.

      - Select **Recurring updates** to update your cluster on your preferred day and start time, when updates are available.

      **NOTE**

      You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see **OpenShift Dedicated update life cycle**.

   b. Provide administrator approval based on your cluster update method:

      - Individual updates: If you select an update version that requires approval, provide an administrator’s acknowledgment and click **Approve and continue**.

      - Recurring updates: If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click **Approve and continue**. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

   c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.

   d. Optional: You can set a grace period for **Node draining** during cluster upgrades. A **1 hour** grace period is set by default.

   e. Click **Next**.

   **NOTE**

   In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see **Understanding Red Hat security ratings**.
20. Review the summary of your selections and click **Create cluster** to start the cluster installation. The installation takes approximately 30–40 minutes to complete.

**NOTE**
If you delete a cluster that was installed into a GCP Shared VPC, inform the VPC owner of the host project to remove the IAM policy roles granted to the service account that was referenced during cluster creation.

**Verification**
- You can monitor the progress of the installation in the **Overview** page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the **Status** in the **Details** section of the page is listed as **Ready**.

### 2.3. CREATING A CLUSTER ON GCP WITH GOOGLE CLOUD MARKETPLACE

When creating an OpenShift Dedicated (OSD) cluster on Google Cloud through the OpenShift Cluster Manager Hybrid Cloud Console, customers can select Google Cloud Marketplace as their preferred billing model. This billing model allows Red Hat customers to take advantage of their Google Committed Use Discounts (CUD) towards OpenShift Dedicated purchased through the Google Cloud Marketplace. Additionally, OSD pricing is consumption-based and customers are billed directly through their Google Cloud account.

**Procedure**

1. Log in to **OpenShift Cluster Manager** and click **Create cluster**.
2. In the **Cloud** tab, click **Create cluster** in the **Red Hat OpenShift Dedicated** row.
3. Under **Billing model**, configure the subscription type and infrastructure type:
   - a. Select the **On-Demand** subscription type.
   - b. From the drop-down menu, select **Google Cloud Marketplace**.
   - c. Select the **Customer Cloud Subscription** infrastructure type.
   - d. Click **Next**.
4. On the **Cloud provider** page, read the provided prerequisites and the Google terms and conditions. Add your service account key.
   - a. Click the **Review Google Terms and Agreements** link.
   - b. To continue creating the cluster, click the checkbox indicating that you agree to the Google terms and agreements.
   - c. Add your service account key.

**NOTE**
For more information about service account keys, click the information icon located next to **Service account key**.
d. Click Next to validate your cloud provider account and go to the Cluster details page.

5. On the Cluster details page, provide a name for your cluster and specify the cluster details:
   a. Add a Cluster name.
   
   b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string. To customize the subdomain, select the Create custom domain prefix checkbox, and enter your domain prefix name in the Domain prefix field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.
   
   c. Select a cluster version from the Version drop-down menu.
   
   d. Select a cloud provider region from the Region drop-down menu.
   
   e. Select a Single zone or Multi-zone configuration.
   
   f. Optional: Select Enable Secure Boot for Shielded VMs to use Shielded VMs when installing your cluster. For more information, see Shielded VMs.

   **IMPORTANT**
   To successfully create a cluster, you must select Enable Secure Boot support for Shielded VMs if your organization has the policy constraint constraints/compute.requireShieldedVm enabled. For more information regarding GCP organizational policy constraints, see Organization policy constraints.
   
   g. Leave Enable user workload monitoring selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

6. Optional: Expand Advanced Encryption to make changes to encryption settings.
   
   a. Select Use Custom KMS keys to use custom KMS keys. If you prefer not to use custom KMS keys, leave the default setting Use default KMS Keys.

   **IMPORTANT**
   To use custom KMS keys, the IAM service account osd-ccs-admin must be granted the Cloud KMS CryptoKey Encrypter/Decrypter role. For more information about granting roles on a resource, see Granting roles on a resource.
   
   With Use Custom KMS keys selected:
   
   i. Select a key ring location from the Key ring location drop-down menu.
   
   ii. Select a key ring from the Key ring drop-down menu.
   
   iii. Select a key name from the Key name drop-down menu.
iv. Provide the **KMS Service Account**

b. **Optional:** Select **Enable additional etcd encryption** if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

**NOTE**

By enabling etcd encryption for the key values in etcd, you incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

c. **Optional:** Select **Enable FIPS cryptography** if you require your cluster to be FIPS validated.

7. Click **Next**.

8. On the **Machine pool** page, select a **Compute node instance type** and a **Compute node count**. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.

**NOTE**

After your cluster is created, you can change the number of compute nodes, but you cannot change the compute node instance type in a created machine pool. You can add machine pools after installation that use a customized instance type. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

9. **Optional:** Expand **Add node labels** to add labels to your nodes. Click **Add additional label** to add more node labels.

10. Click **Next**.

11. In the **Cluster privacy** dialog, select **Public** or **Private** to use either public or private API endpoints and application routes for your cluster.

12. **Optional:** To install the cluster in an existing GCP Virtual Private Cloud (VPC):
   
   a. Select **Install into an existing VPC**

   b. If you are installing into an existing VPC and you want to enable an HTTP or HTTPS proxy for your cluster, select **Configure a cluster-wide proxy**.

13. Click **Next**.

14. **Optional:** To install the cluster into a GCP Shared VPC:
To install a cluster into a Shared VPC, you must use OpenShift Dedicated version 4.13.15 or above. Additionally, the VPC owner of the host project must enable a project as a host project in their Google Cloud console. For more information, see Enable a host project.

a. Select **Install into GCP Shared VPC**

b. Specify the **Host project ID**. If the specified host project ID is incorrect, cluster creation fails.

---

Once you complete the steps within the cluster configuration wizard and click **Create Cluster**, the cluster will go into the "Installation Waiting" state. At this point, you must contact the VPC owner of the host project, who must assign the dynamically-generated service account the following roles: **Computer Network Administrator**, **Compute Security Administrator**, and **DNS Administrator**. The VPC owner of the host project has 30 days to grant the listed permissions before the cluster creation fails. For information about Shared VPC permissions, see Provision Shared VPC.

---

If you opted to install the cluster in an existing GCP VPC, provide your **Virtual Private Cloud (VPC) subnet settings** and select **Next**. You must have created the Cloud network address translation (NAT) and a Cloud router. See the "Additional resources" section for information about Cloud NATs and Google VPCs.

**NOTE**

If you are installing a cluster into a Shared VPC, the VPC name and subnets are shared from the host project.

---

Click **Next**.

If you opted to configure a cluster-wide proxy, provide your proxy configuration details on the **Cluster-wide proxy** page:

a. Enter a value in at least one of the following fields:

- Specify a valid **HTTP proxy URL**
- Specify a valid **HTTPS proxy URL**
- In the **Additional trust bundle** field, provide a PEM encoded X.509 certificate bundle. The bundle is added to the trusted certificate store for the cluster nodes. An additional trust bundle file is required unless the identity certificate for the proxy is signed by an authority from the Red Hat Enterprise Linux CoreOS (RHCOS) trust bundle. If you use an MITM transparent proxy network that does not require additional proxy configuration but requires additional certificate authorities (CAs), you must provide the MITM CA certificate.
NOTE

If you upload an additional trust bundle file without specifying an HTTP or HTTPS proxy URL, the bundle is set on the cluster but is not configured to be used with the proxy.

b. Click Next.

For more information about configuring a proxy with OpenShift Dedicated, see Configuring a cluster-wide proxy.

18. In the **CIDR ranges** dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

**IMPORTANT**

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

If the cluster privacy is set to **Private**, you cannot access your cluster until you configure private connections in your cloud provider.

19. On the **Cluster update strategy** page, configure your update preferences:

a. Choose a cluster update method:

   - Select **Individual updates** if you want to schedule each update individually. This is the default option.

   - Select **Recurring updates** to update your cluster on your preferred day and start time, when updates are available.

   **NOTE**

   You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see [OpenShift Dedicated update life cycle](#).

b. Provide administrator approval based on your cluster update method:

   - Individual updates: If you select an update version that requires approval, provide an administrator’s acknowledgment and click **Approve and continue**.

   - Recurring updates: If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click **Approve and continue**. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.

d. Optional: You can set a grace period for **Node draining** during cluster upgrades. A **1 hour** grace period is set by default.

e. Click **Next**.
NOTE

In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see Understanding Red Hat security ratings.

20. Review the summary of your selections and click Create cluster to start the cluster installation. The installation takes approximately 30–40 minutes to complete.

Verification

- You can monitor the progress of the installation in the Overview page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the Status in the Details section of the page is listed as Ready.

2.4. CREATING A CLUSTER ON GCP WITH A RED HAT CLOUD ACCOUNT

Through OpenShift Cluster Manager, you can create an OpenShift Dedicated cluster on Google Cloud Platform (GCP) using a standard cloud provider account owned by Red Hat.

Procedure

1. Log in to OpenShift Cluster Manager and click Create cluster.

2. In the Cloud tab, click Create cluster in the Red Hat OpenShift Dedicated row.

3. Under Billing model, configure the subscription type and infrastructure type:
   a. Select the Annual subscription type. Only the Annual subscription type is available when you deploy a cluster using a Red Hat cloud account.
      For information about OpenShift Dedicated subscription options, see Cluster subscriptions and registration in the OpenShift Cluster Manager documentation.

      NOTE

      You must have the required resource quota for the Annual subscription type to be available. For more information, contact your sales representative or Red Hat support.

   b. Select the Red Hat cloud account infrastructure type to deploy OpenShift Dedicated in a cloud provider account that is owned by Red Hat.

   c. Click Next.

4. Select Run on Google Cloud Platform and click Next.

5. On the Cluster details page, provide a name for your cluster and specify the cluster details:
   a. Add a Cluster name.
b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string. To customize the subdomain, select the Create custom domain prefix checkbox, and enter your domain prefix name in the Domain prefix field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.

c. Select a cluster version from the Version drop-down menu.

d. Select a cloud provider region from the Region drop-down menu.

e. Select a Single zone or Multi-zone configuration.

f. Optional: Select Enable Secure Boot for Shielded VMs to use Shielded VMs when installing your cluster. For more information, see Shielded VMs.

IMPORTANT

To successfully create a cluster, you must select Enable Secure Boot support for Shielded VMs if your organization has the policy constraint constraints/compute.requireShieldedVm enabled. For more information regarding GCP organizational policy constraints, see Organization policy constraints.

g. Select a Persistent storage capacity for the cluster. For more information, see the Storage section in the OpenShift Dedicated service definition.

h. Specify the number of Load balancers that you require for your cluster. For more information, see the Load balancers section in the OpenShift Dedicated service definition.

i. Leave Enable user workload monitoring selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

j. Optional: Select Enable additional etcd encryption if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

NOTE

By enabling etcd encryption for the key values in etcd, you will incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

k. Click Next.

6. On the Default machine pool page, select a Compute node instance type and a Compute node count. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.
NOTE

After your cluster is created, you can change the number of compute nodes, but you cannot change the compute node instance type in a machine pool. For clusters that use the CCS model, you can add machine pools after installation that use a different instance type. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

7. Optional: Expand Edit node labels to add labels to your nodes. Click Add label to add more node labels and select Next.

8. In the Cluster privacy dialog, select Public or Private to use either public or private API endpoints and application routes for your cluster.

9. Click Next.

10. In the CIDR ranges dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

IMPORTANT

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

If the cluster privacy is set to Private, you cannot access your cluster until you configure private connections in your cloud provider.

11. On the Cluster update strategy page, configure your update preferences:

   a. Choose a cluster update method:

      - Select Individual updates if you want to schedule each update individually. This is the default option.

      - Select Recurring updates to update your cluster on your preferred day and start time, when updates are available.

      NOTE

      You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see OpenShift Dedicated update life cycle.

   b. Provide administrator approval based on your cluster update method:

      - Individual updates: If you select an update version that requires approval, provide an administrator’s acknowledgment and click Approve and continue.

      - Recurring updates: If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click Approve and continue. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

   c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.
d. Optional: You can set a grace period for **Node draining** during cluster upgrades. A **1 hour** grace period is set by default.

e. Click **Next**.

**NOTE**

In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see Understanding Red Hat security ratings.

12. Review the summary of your selections and click **Create cluster** to start the cluster installation. The installation takes approximately 30-40 minutes to complete.

**Verification**

- You can monitor the progress of the installation in the **Overview** page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the **Status** in the **Details** section of the page is listed as **Ready**.

### 2.5. CREATING A CLUSTER ON GCP WITH RED HAT MARKETPLACE

When creating an OpenShift Dedicated (OSD) cluster on Google Cloud through the OpenShift Cluster Manager Hybrid Cloud Console, customers can select Red Hat Marketplace as their preferred billing model. OSD pricing is consumption-based and customers are billed directly through their Red Hat Marketplace account.

**Procedure**

1. Log in to **OpenShift Cluster Manager** and click **Create cluster**.

2. In the **Cloud** tab, click **Create cluster** in the **Red Hat OpenShift Dedicated** row.

3. Under **Billing model**, configure the subscription type and infrastructure type:
   a. Select the **On-Demand** subscription type.
   
   b. From the drop-down menu, select **Red Hat Marketplace**.
   
   c. Click **Next**.

4. On the **Cloud provider** page:
   a. Select **Google Cloud** as your cloud provider.
   
   b. Click the checkbox indicating that you have read and completed all the prerequisites necessary to continue creating your cluster.
   
   c. Add your service account key.
For more information about service account keys, click the information icon located next to Service account key.

d. Click Next to validate your cloud provider account and go to the Cluster details page.

5. On the Cluster details page, provide a name for your cluster and specify the cluster details:

a. Add a Cluster name.

b. Optional: Cluster creation generates a domain prefix as a subdomain for your provisioned cluster on openshiftapps.com. If the cluster name is less than or equal to 15 characters, that name is used for the domain prefix. If the cluster name is longer than 15 characters, the domain prefix is randomly generated to a 15 character string.

To customize the subdomain, select the Create custom domain prefix checkbox, and enter your domain prefix name in the Domain prefix field. The domain prefix cannot be longer than 15 characters, must be unique within your organization, and cannot be changed after cluster creation.

c. Select a cluster version from the Version drop-down menu.

d. Select a cloud provider region from the Region drop-down menu.

e. Select a Single zone or Multi-zone configuration.

f. Optional: Select Enable Secure Boot for Shielded VMs to use Shielded VMs when installing your cluster. For more information, see Shielded VMs.

IMPORTANT

To successfully create a cluster, you must select Enable Secure Boot support for Shielded VMs if your organization has the policy constraint constraints/compute.requireShieldedVm enabled. For more information regarding GCP organizational policy constraints, see Organization policy constraints.

g. Leave Enable user workload monitoring selected to monitor your own projects in isolation from Red Hat Site Reliability Engineer (SRE) platform metrics. This option is enabled by default.

6. Optional: Expand Advanced Encryption to make changes to encryption settings.

a. Select Use Custom KMS keys to use custom KMS keys. If you prefer not to use custom KMS keys, leave the default setting Use default KMS Keys.

IMPORTANT

To use custom KMS keys, the IAM service account osd-ccs-admin must be granted the Cloud KMS CryptoKey Encrypter/ Decrypter role. For more information about granting roles on a resource, see Granting roles on a resource.
i. Select a key ring location from the **Key ring location** drop-down menu.

ii. Select a key ring from the **Key ring** drop-down menu.

iii. Select a key name from the **Key name** drop-down menu.

iv. Provide the **KMS Service Account**

b. Optional: Select **Enable additional etcd encryption** if you require etcd key value encryption. With this option, the etcd key values are encrypted, but not the keys. This option is in addition to the control plane storage encryption that encrypts the etcd volumes in OpenShift Dedicated clusters by default.

**NOTE**

By enabling etcd encryption for the key values in etcd, you incur a performance overhead of approximately 20%. The overhead is a result of introducing this second layer of encryption, in addition to the default control plane storage encryption that encrypts the etcd volumes. Consider enabling etcd encryption only if you specifically require it for your use case.

c. Optional: Select **Enable FIPS cryptography** if you require your cluster to be FIPS validated.

7. Click **Next**.

8. On the **Machine pool** page, select a **Compute node instance type** and a **Compute node count**. The number and types of nodes that are available depend on your OpenShift Dedicated subscription. If you are using multiple availability zones, the compute node count is per zone.

**NOTE**

After your cluster is created, you can change the number of compute nodes, but you cannot change the compute node instance type in a created machine pool. You can add machine pools after installation that use a customized instance type. The number and types of nodes available to you depend on your OpenShift Dedicated subscription.

9. Optional: Expand **Add node labels** to add labels to your nodes. Click **Add additional label** to add more node labels.

10. Click **Next**.

11. In the **Cluster privacy** dialog, select **Public** or **Private** to use either public or private API endpoints and application routes for your cluster.

12. Optional: To install the cluster in an existing GCP Virtual Private Cloud (VPC):
   a. Select **Install into an existing VPC**
   b. If you are installing into an existing VPC and you want to enable an HTTP or HTTPS proxy for your cluster, select **Configure a cluster-wide proxy**.

13. Click **Next**.

14. Optional: To install the cluster into a GCP Shared VPC:
IMPORTANT

To install a cluster into a Shared VPC, you must use OpenShift Dedicated version 4.13.15 or above. Additionally, the VPC owner of the host project must enable a project as a host project in their Google Cloud console. For more information, see Enable a host project.

1. Select Install into GCP Shared VPC
2. Specify the Host project ID. If the specified host project ID is incorrect, cluster creation fails.

IMPORTANT

Once you complete the steps within the cluster configuration wizard and click Create Cluster, the cluster will go into the "Installation Waiting" state. At this point, you must contact the VPC owner of the host project, who must assign the dynamically-generated service account the following roles: Computer Network Administrator, Compute Security Administrator, and DNS Administrator. The VPC owner of the host project has 30 days to grant the listed permissions before the cluster creation fails. For information about Shared VPC permissions, see Provision Shared VPC.

15. If you opted to install the cluster in an existing GCP VPC, provide your Virtual Private Cloud (VPC) subnet settings and select Next. You must have created the Cloud network address translation (NAT) and a Cloud router. See the "Additional resources" section for information about Cloud NATs and Google VPCs.

NOTE

If you are installing a cluster into a Shared VPC, the VPC name and subnets are shared from the host project.

16. Click Next.

17. If you opted to configure a cluster-wide proxy, provide your proxy configuration details on the Cluster-wide proxy page:
   a. Enter a value in at least one of the following fields:
      - Specify a valid HTTP proxy URL
      - Specify a valid HTTPS proxy URL
      - In the Additional trust bundle field, provide a PEM encoded X.509 certificate bundle. The bundle is added to the trusted certificate store for the cluster nodes. An additional trust bundle file is required unless the identity certificate for the proxy is signed by an authority from the Red Hat Enterprise Linux CoreOS (RHCOS) trust bundle. If you use an MITM transparent proxy network that does not require additional proxy configuration but requires additional certificate authorities (CAs), you must provide the MITM CA certificate.
NOTE
If you upload an additional trust bundle file without specifying an HTTP or HTTPS proxy URL, the bundle is set on the cluster but is not configured to be used with the proxy.

b. Click Next.

For more information about configuring a proxy with OpenShift Dedicated, see Configuring a cluster-wide proxy.

18. In the **CIDR ranges** dialog, configure custom classless inter-domain routing (CIDR) ranges or use the defaults that are provided.

**IMPORTANT**

CIDR configurations cannot be changed later. Confirm your selections with your network administrator before proceeding.

If the cluster privacy is set to **Private**, you cannot access your cluster until you configure private connections in your cloud provider.

19. On the **Cluster update strategy** page, configure your update preferences:

a. Choose a cluster update method:

   - Select **Individual updates** if you want to schedule each update individually. This is the default option.

   - Select **Recurring updates** to update your cluster on your preferred day and start time, when updates are available.

   **NOTE**

   You can review the end-of-life dates in the update lifecycle documentation for OpenShift Dedicated. For more information, see OpenShift Dedicated update life cycle.

b. Provide administrator approval based on your cluster update method:

   - Individual updates: If you select an update version that requires approval, provide an administrator’s acknowledgment and click **Approve and continue**.

   - Recurring updates: If you selected recurring updates for your cluster, provide an administrator’s acknowledgment and click **Approve and continue**. OpenShift Cluster Manager does not start scheduled y-stream updates for minor versions without receiving an administrator’s acknowledgment.

c. If you opted for recurring updates, select a preferred day of the week and upgrade start time in UTC from the drop-down menus.

d. Optional: You can set a grace period for **Node draining** during cluster upgrades. A 1 **hour** grace period is set by default.

e. Click **Next**.
NOTE

In the event of critical security concerns that significantly impact the security or stability of a cluster, Red Hat Site Reliability Engineering (SRE) might schedule automatic updates to the latest z-stream version that is not impacted. The updates are applied within 48 hours after customer notifications are provided. For a description of the critical impact security rating, see Understanding Red Hat security ratings.

20. Review the summary of your selections and click **Create cluster** to start the cluster installation. The installation takes approximately 30-40 minutes to complete.

**Verification**

- You can monitor the progress of the installation in the **Overview** page for your cluster. You can view the installation logs on the same page. Your cluster is ready when the **Status** in the **Details** section of the page is listed as **Ready**.

**2.6. ADDITIONAL RESOURCES**

- For information about configuring a proxy with OpenShift Dedicated, see **Configuring a cluster-wide proxy**.

- For information about persistent storage for OpenShift Dedicated, see the **Storage** section in the OpenShift Dedicated service definition.

- For information about load balancers for OpenShift Dedicated, see the **Load balancers** section in the OpenShift Dedicated service definition.

- For more information about etcd encryption, see the **etcd encryption service definition**.

- For information about the end-of-life dates for OpenShift Dedicated versions, see the **OpenShift Dedicated update life cycle**.

- For general information on Cloud network address translation(NAT) that is required for cluster-wide proxy, see **Cloud NAT overview** in the Google documentation.

- For general information on Cloud routers that are required for the cluster-wide proxy, see **Cloud Router overview** in the Google documentation.

- For information on creating VPCs within your Google Cloud Provider account, see **Create and manage VPC networks** in the Google documentation.
CHAPTER 3. CONFIGURING IDENTITY PROVIDERS

After your OpenShift Dedicated cluster is created, you must configure identity providers to determine how users log in to access the cluster.

3.1. UNDERSTANDING IDENTITY PROVIDERS

OpenShift Dedicated includes a built-in OAuth server. Developers and administrators obtain OAuth access tokens to authenticate themselves to the API. As an administrator, you can configure OAuth to specify an identity provider after you install your cluster. Configuring identity providers allows users to log in and access the cluster.

3.1.1. Supported identity providers

You can configure the following types of identity providers:

<table>
<thead>
<tr>
<th>Identity provider</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GitHub or GitHub Enterprise</td>
<td>Configure a GitHub identity provider to validate usernames and passwords against GitHub or GitHub Enterprise’s OAuth authentication server.</td>
</tr>
<tr>
<td>GitLab</td>
<td>Configure a GitLab identity provider to use GitLab.com or any other GitLab instance as an identity provider.</td>
</tr>
<tr>
<td>Google</td>
<td>Configure a Google identity provider using Google’s OpenID Connect integration.</td>
</tr>
<tr>
<td>LDAP</td>
<td>Configure an LDAP identity provider to validate usernames and passwords against an LDAPv3 server, using simple bind authentication.</td>
</tr>
<tr>
<td>OpenID Connect</td>
<td>Configure an OpenID Connect (OIDC) identity provider to integrate with an OIDC identity provider using an Authorization Code Flow.</td>
</tr>
<tr>
<td>htpasswd</td>
<td>Configure an htpasswd identity provider for a single, static administration user. You can log in to the cluster as the user to troubleshoot issues.</td>
</tr>
</tbody>
</table>

**IMPORTANT**

The htpasswd identity provider option is included only to enable the creation of a single, static administration user. htpasswd is not supported as a general-use identity provider for OpenShift Dedicated. For the steps to configure the single user, see Configuring an htpasswd identity provider.

3.1.2. Identity provider parameters

The following parameters are common to all identity providers:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>The provider name is prefixed to provider user names to form an identity name.</td>
</tr>
<tr>
<td>mappingMethod</td>
<td>Defines how new identities are mapped to users when they log in. Enter one of the following values:</td>
</tr>
<tr>
<td></td>
<td><strong>claim</strong>&lt;br&gt;The default value. Provisions a user with the identity’s preferred user name. Fails if a user with that user name is already mapped to another identity.</td>
</tr>
<tr>
<td></td>
<td><strong>lookup</strong>&lt;br&gt;Looks up an existing identity, user identity mapping, and user, but does not automatically provision users or identities. This allows cluster administrators to set up identities and users manually, or using an external process. Using this method requires you to manually provision users.</td>
</tr>
<tr>
<td></td>
<td><strong>add</strong>&lt;br&gt;Provisions a user with the identity’s preferred user name. If a user with that user name already exists, the identity is mapped to the existing user, adding to any existing identity mappings for the user. Required when multiple identity providers are configured that identify the same set of users and map to the same user names.</td>
</tr>
</tbody>
</table>

**NOTE**

When adding or changing identity providers, you can map identities from the new provider to existing users by setting the `mappingMethod` parameter to `add`.

### 3.2. CONFIGURING A GITHUB IDENTITY PROVIDER

Configure a GitHub identity provider to validate user names and passwords against GitHub or GitHub Enterprise’s OAuth authentication server and access your OpenShift Dedicated cluster. OAuth facilitates a token exchange flow between OpenShift Dedicated and GitHub or GitHub Enterprise.

**WARNING**

Configuring GitHub authentication allows users to log in to OpenShift Dedicated with their GitHub credentials. To prevent anyone with any GitHub user ID from logging in to your OpenShift Dedicated cluster, you must restrict access to only those in specific GitHub organizations or teams.

**Prerequisites**

- The OAuth application must be created directly within the GitHub organization settings by the GitHub organization administrator.

- [GitHub organizations or teams](https://github.com) are set up in your GitHub account.

**Procedure**
1. From OpenShift Cluster Manager, navigate to the Clusters page and select the cluster that you need to configure identity providers for.

2. Click the Access control tab.

3. Click Add identity provider.

   **NOTE**
   You can also click the Add Oauth configuration link in the warning message displayed after cluster creation to configure your identity providers.

4. Select GitHub from the drop-down menu.

5. Enter a unique name for the identity provider. This name cannot be changed later.

   - An OAuth callback URL is automatically generated in the provided field. You will use this to register the GitHub application.

     ```
     https://oauth-openshift.apps.<cluster_name>.<cluster_domain>/oauth2callback/<idp_provider_name>
     ```

     For example:

     ```
     https://oauth-openshift.apps.openshift-cluster.example.com/oauth2callback/github
     ```

6. Register an application on GitHub.

7. Return to OpenShift Dedicated and select a mapping method from the drop-down menu. **Claim** is recommended in most cases.

8. Enter the **Client ID** and **Client secret** provided by GitHub.

9. Enter a **hostname**. A hostname must be entered when using a hosted instance of GitHub Enterprise.

10. Optional: You can use a certificate authority (CA) file to validate server certificates for the configured GitHub Enterprise URL. Click **Browse** to locate and attach a **CA file** to the identity provider.

11. Select **Use organizations** or **Use teams** to restrict access to a particular GitHub organization or a GitHub team.

12. Enter the name of the organization or team you would like to restrict access to. Click **Add more** to specify multiple organizations or teams that users can be a member of.

13. Click **Confirm**.

**Verification**

- The configured identity provider is now visible on the Access control tab of the Clusters page.

### 3.3. Configuring a GitLab Identity Provider
Configure a GitLab identity provider to use GitLab.com or any other GitLab instance as an identity provider.

Prerequisites

- If you use GitLab version 7.7.0 to 11.0, you connect using the OAuth integration. If you use GitLab version 11.1 or later, you can use OpenID Connect (OIDC) to connect instead of OAuth.

Procedure

1. From OpenShift Cluster Manager, navigate to the Clusters page and select the cluster that you need to configure identity providers for.

2. Click the Access control tab.

3. Click Add identity provider.

   NOTE
   You can also click the Add Oauth configuration link in the warning message displayed after cluster creation to configure your identity providers.

4. Select GitLab from the drop-down menu.

5. Enter a unique name for the identity provider. This name cannot be changed later.

   - An OAuth callback URL is automatically generated in the provided field. You will provide this URL to GitLab.

     For example:

     https://oauth-openshift.apps.<cluster_name>.<cluster_domain>/oauth2callback/gitlab

6. Add a new application in GitLab.

7. Return to OpenShift Dedicated and select a mapping method from the drop-down menu. Claim is recommended in most cases.

8. Enter the Client ID and Client secret provided by GitLab.

9. Enter the URL of your GitLab provider.

10. Optional: You can use a certificate authority (CA) file to validate server certificates for the configured GitLab URL. Click Browse to locate and attach a CA file to the identity provider.

11. Click Confirm.

Verification

- The configured identity provider is now visible on the Access control tab of the Clusters page.
### 3.4. CONFIGURING A GOOGLE IDENTITY PROVIDER

Configure a Google identity provider to allow users to authenticate with their Google credentials.

**WARNING**

Using Google as an identity provider allows any Google user to authenticate to your server. You can limit authentication to members of a specific hosted domain with the `hostedDomain` configuration attribute.

**Procedure**

1. From **OpenShift Cluster Manager**, navigate to the **Clusters** page and select the cluster that you need to configure identity providers for.

2. Click the **Access control** tab.

3. Click **Add identity provider**.

   **NOTE**
   
   You can also click the **Add Oauth configuration** link in the warning message displayed after cluster creation to configure your identity providers.

4. Select **Google** from the drop-down menu.

5. Enter a unique name for the identity provider. This name cannot be changed later.

   - An **OAuth callback URL** is automatically generated in the provided field. You will provide this URL to Google.

     ```
     https://oauth-openshift.apps.<cluster_name>.<cluster_domain>/oauth2callback/<idp_provider_name>
     ```

     For example:

     ```
     https://oauth-openshift.apps.openshift-cluster.example.com/oauth2callback/google
     ```

6. Configure a Google identity provider using **Google’s OpenID Connect integration**.

7. Return to OpenShift Dedicated and select a mapping method from the drop-down menu. **Claim** is recommended in most cases.

8. Enter the **Client ID** of a registered Google project and the **Client secret** issued by Google.

9. Enter a hosted domain to restrict users to a Google Apps domain.

10. Click **Confirm**.

**Verification**
• The configured identity provider is now visible on the Access control tab of the Clusters page.

### 3.5. CONFIGURING A LDAP IDENTITY PROVIDER

Configure the LDAP identity provider to validate user names and passwords against an LDAPv3 server, using simple bind authentication.

**Prerequisites**

• When configuring a LDAP identity provider, you will need to enter a configured LDAP URL. The configured URL is an RFC 2255 URL, which specifies the LDAP host and search parameters to use. The syntax of the URL is:

```
```

<table>
<thead>
<tr>
<th>URL component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ldap</strong></td>
<td>For regular LDAP, use the string <code>ldap</code>. For secure LDAP (LDAPS), use <code>ldaps</code> instead.</td>
</tr>
<tr>
<td><strong>host:port</strong></td>
<td>The name and port of the LDAP server. Defaults to <strong>localhost:389</strong> for ldap and <strong>localhost:636</strong> for LDAPS.</td>
</tr>
<tr>
<td><strong>basedn</strong></td>
<td>The DN of the branch of the directory where all searches should start from. At the very least, this must be the top of your directory tree, but it could also specify a subtree in the directory.</td>
</tr>
<tr>
<td><strong>attribute</strong></td>
<td>The attribute to search for. Although RFC 2255 allows a comma-separated list of attributes, only the first attribute will be used, no matter how many are provided. If no attributes are provided, the default is to use <code>uid</code>. It is recommended to choose an attribute that will be unique across all entries in the subtree you will be using.</td>
</tr>
<tr>
<td><strong>scope</strong></td>
<td>The scope of the search. Can be either <code>one</code> or <code>sub</code>. If the scope is not provided, the default is to use a scope of <code>sub</code>.</td>
</tr>
<tr>
<td><strong>filter</strong></td>
<td>A valid LDAP search filter. If not provided, defaults to <code>(objectClass=*)</code></td>
</tr>
</tbody>
</table>

When doing searches, the attribute, filter, and provided user name are combined to create a search filter that looks like:

```
&(<filter>)(<attribute>=<username>)
```

**IMPORTANT**

If the LDAP directory requires authentication to search, specify a `bindDN` and `bindPassword` to use to perform the entry search.

**Procedure**
1. From OpenShift Cluster Manager, navigate to the Clusters page and select the cluster that you need to configure identity providers for.

2. Click the Access control tab.

3. Click Add identity provider.

   NOTE

   You can also click the Add Oauth configuration link in the warning message displayed after cluster creation to configure your identity providers.

4. Select LDAP from the drop-down menu.

5. Enter a unique name for the identity provider. This name cannot be changed later.

6. Select a mapping method from the drop-down menu. Claim is recommended in most cases.

7. Enter a LDAP URL to specify the LDAP search parameters to use.

8. Optional: Enter a Bind DN and Bind password.

9. Enter the attributes that will map LDAP attributes to identities.
   - Enter an ID attribute whose value should be used as the user ID. Click Add more to add multiple ID attributes.
   - Optional: Enter a Preferred username attribute whose value should be used as the display name. Click Add more to add multiple preferred username attributes.
   - Optional: Enter an Email attribute whose value should be used as the email address. Click Add more to add multiple email attributes.

10. Optional: Click Show advanced Options to add a certificate authority (CA) file to your LDAP identity provider to validate server certificates for the configured URL. Click Browse to locate and attach a CA file to the identity provider.

11. Optional: Under the advanced options, you can choose to make the LDAP provider Insecure. If you select this option, a CA file cannot be used.

   IMPORTANT

   If you are using an insecure LDAP connection (ldap:// or port 389), then you must check the Insecure option in the configuration wizard.

12. Click Confirm.

Verification

- The configured identity provider is now visible on the Access control tab of the Clusters page.

### 3.6. CONFIGURING AN OPENID IDENTITY PROVIDER

Configure an OpenID identity provider to integrate with an OpenID Connect identity provider using an Authorization Code Flow.
The Authentication Operator in OpenShift Dedicated requires that the configured OpenID Connect identity provider implements the OpenID Connect Discovery specification.

Claims are read from the JWT id_token returned from the OpenID identity provider and, if specified, from the JSON returned by the Issuer URL.

At least one claim must be configured to use as the user’s identity.

You can also indicate which claims to use as the user’s preferred user name, display name, and email address. If multiple claims are specified, the first one with a non-empty value is used. The standard claims are:

<table>
<thead>
<tr>
<th>Claim</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>preferred_username</td>
<td>The preferred user name when provisioning a user. A shorthand name that the user wants to be referred to as, such as janedoe. Typically a value that corresponding to the user’s login or username in the authentication system, such as username or email.</td>
</tr>
<tr>
<td>email</td>
<td>Email address.</td>
</tr>
<tr>
<td>name</td>
<td>Display name.</td>
</tr>
</tbody>
</table>

See the OpenID claims documentation for more information.

Prerequisites

- Before you configure OpenID Connect, check the installation prerequisites for any Red Hat product or service you want to use with your OpenShift Dedicated cluster.

Procedure

1. From OpenShift Cluster Manager, navigate to the Clusters page and select the cluster that you need to configure identity providers for.

2. Click the Access control tab.

3. Click Add identity provider.

4. Select OpenID from the drop-down menu.

5. Enter a unique name for the identity provider. This name cannot be changed later.

   - An OAuth callback URL is automatically generated in the provided field.

   ```
   IMPORTANT
   The Authentication Operator in OpenShift Dedicated requires that the configured OpenID Connect identity provider implements the OpenID Connect Discovery specification.
   ```
6. Register a new OpenID Connect client in the OpenID identity provider by following the steps to create an authorization request.

7. Return to OpenShift Dedicated and select a mapping method from the drop-down menu. Claim is recommended in most cases.

8. Enter a **Client ID** and **Client secret** provided from OpenID.

9. Enter an **Issuer URL**. This is the URL that the OpenID provider asserts as the Issuer Identifier. It must use the https scheme with no URL query parameters or fragments.

10. Enter an **Email** attribute whose value should be used as the email address. Click **Add more** to add multiple email attributes.

11. Enter a **Name** attribute whose value should be used as the preferred username. Click **Add more** to add multiple preferred usernames.

12. Enter a **Preferred username** attribute whose value should be used as the display name. Click **Add more** to add multiple display names.

13. Optional: Click **Show advanced Options** to add a certificate authority (CA) file to your OpenID identity provider.

14. Optional: Under the advanced options, you can add **Additional scopes**. By default, the **OpenID** scope is requested.

15. Click **Confirm**.

**Verification**

- The configured identity provider is now visible on the **Access control** tab of the **Clusters** page.

### 3.7. CONFIGURING AN HTPASSWD IDENTITY PROVIDER

Configure an htpasswd identity provider to create a single, static user with cluster administration privileges. You can log in to your cluster as the user to troubleshoot issues.

**IMPORTANT**

The htpasswd identity provider option is included only to enable the creation of a single, static administration user. htpasswd is not supported as a general-use identity provider for OpenShift Dedicated.

**Procedure**

1. From **OpenShift Cluster Manager**, navigate to the **Clusters** page and select your cluster.

2. Select **Access control → Identity providers**.
3. Click Add identity provider.

4. Select HTPasswd from the Identity Provider drop-down menu.

5. Add a unique name in the Name field for the identity provider.

6. Use the suggested username and password for the static user, or create your own.

   **NOTE**
   
   The credentials defined in this step are not visible after you select Add in the following step. If you lose the credentials, you must recreate the identity provider and define the credentials again.

7. Select Add to create the htpasswd identity provider and the single, static user.

8. Grant the static user permission to manage the cluster:
   
   a. Under Access control → Cluster Roles and Access, select Add user.
   
   b. Enter the User ID of the static user that you created in the preceding step.
   
   c. Select a Group.
      
      - If you are installing OpenShift Dedicated using the Customer Cloud Subscription (CCS) infrastructure type, choose either the dedicated-admins or cluster-admins group. Users in the dedicated-admins group have standard administrative privileges for OpenShift Dedicated. Users in the cluster-admins group have full administrative access to the cluster.
      
      - If you are installing OpenShift Dedicated using the Red Hat cloud account infrastructure type, the dedicated-admins group is automatically selected.
   
   d. Select Add user to grant the administration privileges to the user.

**Verification**

- The configured htpasswd identity provider is visible on the Access control → Identity providers page.

   **NOTE**
   
   After creating the identity provider, synchronization usually completes within two minutes. You can log in to the cluster as the user after the htpasswd identity provider becomes available.

- The single, administrative user is visible on the Access control → Cluster Roles and Access page. The administration group membership of the user is also displayed.

**Additional resources**

- Customer administrator user

**3.8. ACCESSING YOUR CLUSTER**
After you have configured your identity providers, users can access the cluster from Red Hat OpenShift Cluster Manager.

Prerequisites

- You logged in to OpenShift Cluster Manager.
- You created an OpenShift Dedicated cluster.
- You configured an identity provider for your cluster.
- You added your user account to the configured identity provider.

Procedure

1. From OpenShift Cluster Manager, click on the cluster you want to access.
2. Click Open Console.
3. Click on your identity provider and provide your credentials to log into the cluster.
4. Click Open console to open the web console for your cluster.
5. Click on your identity provider and provide your credentials to log in to the cluster. Complete any authorization requests that are presented by your provider.
CHAPTER 4. REVOKING PRIVILEGES AND ACCESS TO AN OPENSHIFT DEDICATED CLUSTER

As cluster owner, you can revoke admin privileges and user access to a OpenShift Dedicated cluster.

4.1. REVOKING ADMINISTRATOR PRIVILEGES FROM A USER

Follow the steps in this section to revoke `dedicated-admin` privileges from a user.

Prerequisites

- You logged in to OpenShift Cluster Manager.
- You created an OpenShift Dedicated cluster.
- You have configured a GitHub identity provider for your cluster and added an identity provider user.
- You granted `dedicated-admin` privileges to a user.

Procedure

1. Navigate to OpenShift Cluster Manager and select your cluster.
2. Click the Access control tab.
3. In the Cluster Roles and Access tab, select next to a user and click Delete.

Verification

- After revoking the privileges, the user is no longer listed as part of the `dedicated-admins` group under Access control → Cluster Roles and Access on the OpenShift Cluster Manager page for your cluster.

4.2. REVOKING USER ACCESS TO A CLUSTER

You can revoke cluster access from an identity provider user by removing them from your configured identity provider.

You can configure different types of identity providers for your OpenShift Dedicated cluster. The following example procedure revokes cluster access for a member of a GitHub organization or team that is configured for identity provision to the cluster.

Prerequisites

- You have an OpenShift Dedicated cluster.
- You have a GitHub user account.
- You have configured a GitHub identity provider for your cluster and added an identity provider user.
Procedure

1. Navigate to github.com and log in to your GitHub account.

2. Remove the user from your GitHub organization or team:
   - If your identity provider configuration uses a GitHub organization, follow the steps in Removing a member from your organization in the GitHub documentation.
   - If your identity provider configuration uses a team within a GitHub organization, follow the steps in Removing organization members from a team in the GitHub documentation.

Verification

- After removing the user from your identity provider, the user cannot authenticate into the cluster.
CHAPTER 5. DELETING AN OPENSSHIFT DEDICATED CLUSTER

As cluster owner, you can delete your OpenShift Dedicated clusters.

5.1. DELETING YOUR CLUSTER

You can delete your OpenShift Dedicated cluster in Red Hat OpenShift Cluster Manager.

- You logged in to OpenShift Cluster Manager.
- You created an OpenShift Dedicated cluster.

Procedure

1. From OpenShift Cluster Manager, click on the cluster you want to delete.
2. Select Delete cluster from the Actions drop-down menu.
3. Type the name of the cluster highlighted in bold, then click Delete. Cluster deletion occurs automatically.

**NOTE**

If you delete a cluster that was installed into a GCP Shared VPC, inform the VPC owner of the host project to remove the IAM policy roles granted to the service account that was referenced during cluster creation.