

Managing virtual clusters

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Creating virtual clusters

In Cloudera Data Engineering (CDE), a virtual cluster is an individual auto-scaling cluster with defined CPU and memory ranges. Jobs are associated with virtual clusters, and virtual clusters are associated with an environment. You can create as many virtual clusters as you need.

Before you begin

To create a virtual cluster, you must have an environment with Cloudera Data Engineering (CDE) enabled.

Procedure

1. From the CDE Overview page, select the environment you want to create a virtual cluster in.
2. In the Virtual Clusters column, click the plus icon at the top right to create a new virtual cluster.
If the environment has no virtual clusters associated with it, the page displays a Create DE Cluster button that launches the same wizard.
3. Enter a Cluster Name.
Cluster names must:
 - Begin with a letter
 - Be between 3 and 30 characters (inclusive)
 - Contain only alphanumeric characters and hyphens
4. Select the CDE Service to create the virtual cluster in.
The environment you selected before launching the wizard is selected by default, but you can use the wizard to create a virtual cluster in a different CDE service.
5. Select the Spark Version to use in the virtual cluster.
6. Click Create.

Results

On the CDE Overview page, select the environment to view the virtual cluster initialization status. You can also click the three-dot menu for the virtual cluster to view the logs.

What to do next

For CDE on private cloud, you must perform some additional manual steps. You must do this for each virtual cluster you create.

1. Download [cdp-cde-utils.sh](#) to your local machine.
2. Create a directory to store the files, and change to that directory:

```
mkdir -p /tmp/cde-latest && cd /tmp/cde-latest
```

3. Embedded Container Service (ECS)

Copy the extracted utility script (`cdp-cde-utils.sh`) to one of the Embedded Container Service (ECS) cluster hosts. To identify the ECS cluster hosts:

- a. Log in to the Cloudera Manager web interface.
- b. Go to ClustersExperience ClusterECSHosts.
- c. Select one of the listed hosts, and copy the script to that host.

Red Hat OpenShift Container Platform (OCP)

Copy the extracted utility script (`cdp-cde-utils.sh`) and the OpenShift kubeconfig file to one of the HDFS service gateway hosts, and install the `kubectl` utility:

- a. Log in to the Cloudera Manager web interface.
- b. Go to ClustersBase ClusterHDFSInstances.
- c. Select one of the Gateway hosts, log in using the security password that was set, and copy the script to that host.
- d. Copy the [OCP kubeconfig](#) file to the same host.
- e. Export the OCP kubeconfig file:

```
export KUBECONFIG=[***path_of_the_copied_OCP_Kubeconfig_file***]
```

- f. On that host, install the `kubectl` utility following the [instructions](#) in the Kubernetes documentation. Make sure to install a `kubectl` version between 1.16 and 1.22 (inclusive). Cloudera recommends installing the version that matches the Kubernetes version installed on the OpenShift cluster.

4. On the cluster host that you copied the script to, set the script permissions to be executable:

```
chmod +x /PATH/TO/cdp-cde-utils.sh
```

5. Identify the virtual cluster endpoint:

- a. In the Cloudera Manager web UI, go to the Experiences page, and then click Open CDP Private Cloud Experiences.
- b. Click the Data Engineering tile.
- c. Select the CDE service containing the virtual cluster you want to activate.

d.



Click [Cluster Details](#).

- e. Click JOBS API URL to copy the URL to your clipboard.



Note: Currently, the URL copied to your clipboard begins with `http://`, not `https://`. To use the URL, you must manually change this to `https://`.

- f. Paste the URL into a text editor to identify the endpoint host. For example, the URL is similar to the following:

```
http://dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com/dex/api/v1
```

The endpoint host is `dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com`.

6. On the ECS or HDFS gateway host you selected previously, initialize the virtual cluster using the `cdp-cde-utils.sh` script. You can either generate and use a self-signed certificate, or provide a signed certificate and private key.

Generate a self-signed certificate

```
./cdp-cde-utils.sh init-virtual-cluster -h <ENDPOINT_HOST> -a
```

For example, using the previous example URL, the endpoint host is `dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com`:

```
./cdp-cde-utils.sh init-virtual-cluster -h dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com -a
```

Use a signed certificate and private key

Make sure that the certificate is a wildcard certificate for the cluster endpoint. For example, `*.dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com`

```
./cdp-cde-utils.sh init-virtual-cluster -h <ENDPOINT_HOST> -c /PATH/TO/CERT -k /PATH/TO/KEYFILE
```

For example, using the previous example URL, the endpoint host is `dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com`:

```
./cdp-cde-utils.sh init-virtual-cluster -h dfdj6kgx.cde-2cdxw5x5.ecs-demo.example.com -c /tmp/cde-pvc.crt -k /tmp/cde-pvc.key
```

You must perform this procedure for each virtual cluster you create.

Managing virtual clusters

You can view configuration, metrics, and logs for existing virtual clusters. You can also view jobs associated with a cluster, clone a cluster, and delete a cluster

To view cluster details:

1. Navigate to the Cloudera Data Engineering Overview page by clicking the Data Engineering tile in the Cloudera Data Platform (CDP) management console.
2. In the Environments column, select the environment containing the virtual cluster you want to manage.
3. In the Virtual Clusters column on the right, click the Cluster Details icon for the virtual cluster you want to manage.
4. On the Configuration tab, you can view details about the cluster, including the cluster name and CDP environment. These parameters cannot be modified.

The virtual cluster Overview page provides details about the virtual cluster, and includes links to several resources, such as the API documentation, and the Jobs API URL. You can switch between the following tabs to view additional information:

Configuration

The Configuration tab lists details about the cluster, including the cluster name, CDP environment, and the CPU and memory auto-scale ranges. These parameters cannot be modified. If you need different auto-scale ranges, create a new virtual cluster.

Logs

The Logs tab displays the latest log entries for the virtual cluster.

Deleting virtual clusters

If you no longer need a particular virtual cluster, you can delete it. Deleting a virtual cluster instantly deletes all metadata associated with the cluster, including job configurations and log files. Do not delete a virtual cluster unless you are certain you no longer need access to any of the applications, jobs, or log files. Job run history is maintained separately, and is not deleted even if you delete a virtual cluster.

Procedure

1. On the Cloudera Data Engineering (CDE) Overview page, select the environment containing the virtual cluster that you want to delete.
2. In the Virtual Clusters column for the selected environment, click the menu icon at the top right of the virtual cluster that you want to delete, and then click Delete.



Warning: Deleting a virtual cluster deletes all metadata associated with the cluster, including job configurations and log files. Do not do this unless you are certain that you no longer need any of these.

3. Confirm that you want to delete the cluster by entering the cluster name and then clicking Delete.