

CDP Private Cloud Data Services 1.5.4

Installing CDP Private Cloud Data Services on the Embedded Container Service

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The Cloudera logo is displayed in a bold, orange, sans-serif font. The word "CLOUDERA" is written in all caps, with a stylized 'E' that has three horizontal bars.

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Requirements

Software Support Matrix for ECS

This support matrix lists the supported software for the CDP Private Cloud Base cluster and the CDP Private Cloud Data Services containerized cluster when installing using the Embedded Container Service (ECS).

Base Cluster	Version	<ul style="list-style-type: none"> Cloudera Manager 7.11.3 CHF 6 7.1.9 CHF 6 7.1.7 SP 3 7.1.8 CHF 22
	Base OS	<ul style="list-style-type: none"> See Private Cloud Base OS requirements
	TLS	<ul style="list-style-type: none"> AutoTLS (Custom CMCA) AutoTLS (Self-signed)
	Kerberos	<ul style="list-style-type: none"> AD FreeIPA
	JDK	<ul style="list-style-type: none"> See Java Requirements
	Custom service principals	<ul style="list-style-type: none"> Not supported
	Data Lake Storage	<ul style="list-style-type: none"> HDFS Ozone Iceberg v2 (with HDFS and Ozone)
	Base DB (HMS access from CDW Data Services)	<ul style="list-style-type: none"> MySQL 5.7, 8.0 Maria DB 10.2, 10.3, 10.4, 10.5, 10.6 Oracle 19.19 Postgres 12, 14
Containerized Cluster	ECS OS	<ul style="list-style-type: none"> OEL (RHCK Kernel Only) 8.7, 8.8, 8.9, 9.1, 9.2, 9.3 RHEL 8.7, 8.8, 8.9. 9.1, 9.2, 9.3
	Control Plane Metadata DB	<ul style="list-style-type: none"> Embedded
	Vault	<ul style="list-style-type: none"> Embedded
	Docker registry type	<ul style="list-style-type: none"> Secure registry with self signed CA certs (pwd protected + self signed certs) Embedded (ECS only. Not recommended)
	NFS	<ul style="list-style-type: none"> Embedded External
	IdP	<ul style="list-style-type: none"> FreeIPA ActiveDirectory (LDAP) OpenLDAPs
	Network Access	<ul style="list-style-type: none"> Airgap Internet HTTP proxy (CML)
	TLS	<ul style="list-style-type: none"> Manual - CA signed ESC server signed (ECS only)

GPU Nodes	OS	• RHEL 8.7, 8.8, 8.9, 9.1, 9.2, 9.3
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CDP Private Cloud Base Software Requirements

The software requirements for the nodes on which CDP Private Cloud Data Services are deployed are identical to CDP Private Cloud Base.

Your Private Cloud Base cluster must have the operating system, JDK, database, CDP components, and CDP Runtime version compatible with CDP Private Cloud Data Services. You must first set up the Private Cloud Base cluster, then you can install the Private Cloud Containerized cluster.

For more information about the requirements for the Private Cloud Base cluster, see [CDP Private Cloud Base Requirements and Supported Versions](#) and the Base Cluster section of the [Software Support Matrix for ECS](#) on page 4.

The following CDP Private Cloud Base cluster services are required to fully access the Data Services:

- Zookeeper
- HBase
- Hive Metastore (HMS)
- Hive on Tez (needed for using compaction)
- Ranger
- Atlas
- HDFS
- Ozone
- YARN
- Kafka
- Solr

In addition to this, the hive user should be able to create and list an Ozone bucket. For information about creating and listing ozone bucket, see *Managing buckets*.

Related Information

[Managing buckets](#)

CDP Private Cloud Data Services Hardware Requirements

Minimum and recommended hardware to successfully install and run Private Cloud Data Services.

In addition to the resources required for the Control Plane, additional resources will be required depending on the Data Service(s) you intend to run. Minimum and recommended additional resource requirements for each of the Data Services can be found in the pages below. To calculate the total minimum or recommended resource requirements for your CDP Private Cloud Data Services cluster, add the resources required for the Control Plane to the total minimum or recommended additional resources for your chosen Data Service(s).

You can also use the CDP Private Cloud Data Services Spreadsheet to model the number and specification of hosts required for a deployment. See [How to use the CDP Private Cloud Data Services sizing spreadsheet](#) on page 8.

Requirements for HA and Non-HA Control Plane

Standard resource mode requirements for standalone HA and Non-HA Control Plane.

Component	Minimum	Recommended
Node Count	1 (Non-HA)	3 (HA)
CPU	16 cores	32 cores (per node)
Memory	32 GB	64 GB (per node)

Component	Minimum	Recommended
Storage	300 GB	1 TB (per node)
Network Bandwidth	1GB/s to all nodes and base cluster	1GB/s to all nodes and base cluster

Additional resource requirements for Cloudera Data Warehouse

Standard resource mode requirements for Cloudera Data Warehouse.

The following table lists the minimum and recommended compute (processor), memory, storage, and network bandwidth required for each OpenShift or ECS worker node using the Standard Resource Mode for production use case. Note that the actual node still needs some extra resources to run the operating system, Kubernetes engine, and Cloudera Manager agent on ECS.

Component	Minimum	Recommended
Node Count	4	10
CPU per worker	16 cores [or 8 cores or 16 threads that have Simultaneous Multithreading (SMT) enabled]	32+ cores (can also be achieved by enabling SMT)
Memory per worker	128 GB per node	384 GB* per node
FAST (Fully Automated Storage Tiering) Cache - Locally attached SCSI device(s) on every worker. Preferred: NVMe and SSD. OCP uses Local Storage Operator. ECS uses Local Path Provisioner.	1.2 TB* SATA, SSD per host	1.2 TB* NVMe/SSD per host
Network Bandwidth	1 GB/s guaranteed bandwidth to every CDP Private Cloud Base node	10 GB/s guaranteed bandwidth to every CDP Private Cloud Base node



Important: When you add memory and storage, it is very important that you add it in the increments as follows:

- Increments of 128 GB of memory
- Increments of 600 GB of locally attached SSD/NVMe storage

If you add memory or storage that is not in the above increments, the memory and storage that exceeds these increments is not used for executor pods. Instead, the extra memory and storage can be used by other pods that require fewer resources.

For example, if you add 200 GB of memory, only 128 GB is used by the executor pods. If you add 2 TB of locally attached storage, only 1.8 TB is used by the executor pods.

Additional resource requirements for Cloudera Data Engineering

For standalone Cloudera Data Engineering, Cloudera recommends three nodes (one master and two workers) with the following minimum memory, storage, and hardware requirements for each node:

Component	Minimum	Recommended
Node Count	2	4
CPU	16 cores for CDE workspace (base and virtual cluster) and 8 cores for workload	16 cores for CDE workspace (base and virtual cluster) and 32 cores (you can extend this depending upon the workload size)
Memory	64 GB for CDE workspace (base and virtual cluster) and 32 GB (you can extend this depending upon the workload size)	64 GB for CDE workspace (base and virtual cluster) and 64 GB (you can extend this depending upon the workload size)

* Depending on the number of executors you want to run on each physical node, the per-node requirements change proportionally. For example, if you are running 3 executor pods per physical node, you require 384 GB of memory and approximately 1.8TB (600GB per executor) of locally attached SSD/NVMe storage for FAST Cache.

Component	Minimum	Recommended
Storage	200 GB block storage and 500 GB NFS storage	200 GB block storage and 500 GB NFS storage
Network Bandwidth	1 GB/s to all nodes and base cluster	10 GB/s to all nodes and base cluster



Important: Optionally, if you want to use GPU in Spark, the Spark RAPIDS library is validated and certified by Nvidia for *NVIDIA P100, V100, T4 and A2/A10/A30/A100* GPU architecture.

CDE Service and Virtual Cluster requirements

- CDE Service requirements: Overall for a CDE service, it requires 110 GB Block PV or NFS PV, 7 CPU cores, and 15 GB memory.

Table 1: The following are the CDE Service requirements:

Component	vCPU	Memory	Block PV or NFS PV	Number of replicas
Embedded DB	4	8 GB	100 GB	1
Config Manager	500 m	1 GB	--	2
Dex Downloads	250 m	512 MB	--	1
Knox	250 m	1 GB	--	1
Management API	1	2 GB	--	1
NGINX Ingress Controller	100 m	90 MB	--	1
FluentD Forwarder	250 m	512 MB	--	1
Grafana	250 m	512 MB	10 GB	1
Data Connector	250 m	512 MB	--	1
Total	7	15 GB	110 GB	

- CDE Virtual Cluster requirements:
 - For Spark 3: Overall storage of 400 GB Block PV or Shared Storage PV, 5.35 CPU cores, and 15.6 GB per virtual cluster.
 - For Spark 2: If you are using Spark 2, you need additional 500 m CPU, 4.5 GB memory and 100 GB storage, that is, the overall storage of 500 GB Block PV or Shared Storage PV, 5.85 CPU cores, and 20.1 GB per virtual cluster.



Important: The CDE service and virtual cluster requirements does not include workloads. See the below workload information on the additional resources based on workload.

Table 2: The following are the CDE Virtual Cluster requirements for Spark 3:

Component	vCPU	Memory	Block PV or NFS PV	Number of replicas
Airflow API	350 m	612 MB	100 GB	1
Airflow Scheduler	1	1 GB	100 GB	1
Airflow Web	250 m	512 MB	--	1
Runtime API	250 m	512 MB	100 GB	1
Livy	3	12 GB	100 GB	1
SHS	250 m	1 GB		1
Pipelines	250 m	512 MB	--	1

Component	vCPU	Memory	Block PV or NFS PV	Number of replicas
Total	5350 m	15.6 GB	400 GB	

- Workloads: Depending upon the workload, you must configure resources.
 - The Spark Driver container uses resources based on the configured driver cores and driver memory and additional 40% memory overhead.
 - In addition to this, Spark Driver uses 110 m CPU and 232 MB for the sidecar container.
 - The Spark Executor container uses resources based on the configured executor cores and executor memory and additional 40 % memory overhead.
 - In addition to this, Spark Executor uses 10 m CPU and 32 MB for the sidecar container.
 - Minimal Airflow jobs need 100 m CPU and 200 MB memory per Airflow worker.

Additional resource requirements for Cloudera Machine Learning

Standard resource mode requirements for standalone Cloudera Machine Learning. Node count should not be a limiting factor assuming the other memory and CPU minimums are reached.

Component	Minimum	Recommended
Node Count	1	1 per workspace + additional nodes depending on expected user workloads
CPU	32 Cores Per Workspace+ additional Cores depending on expected user workloads	32 Cores Per workspace + additional Cores depending on expected user workloads
Memory	128 GB + additional memory depending on the expected workloads	256 GB Per Workspace + additional memory depending on the expected workloads
Storage	Set up ECS/Longhorn with SSDs with a minimum of 600 GB and recommended cumulative 4500 GB of Block storage for project use. For Production environments, it is strongly recommended to setup an External NFS environment with at least 1000 GB of NFS storage with additional Block storage based on project file sizing.	
Network Bandwidth	1GB/s to all nodes and base cluster	1GB/s to all nodes and base cluster

Additional Resources for User Workloads:

Component	Minimum	Recommended
CPU	1 Core per concurrent workload	2–16 cores per concurrent workload (dependent on use cases)
Memory	2 GB per concurrent workload	4–64 GB per concurrent workload (dependent on use cases)

How to use the CDP Private Cloud Data Services sizing spreadsheet

You can use the sizing spreadsheet to model the hardware requirements for a CDP Private Cloud Data Services deployment.

Overview

The CDP Private Cloud Data Services Sizing spreadsheet is a spreadsheet that you can use to model the quantity and specifications for worker hosts required in a CDP Private Cloud Data Services deployment.

This spreadsheet is intended to use information about workloads you are planning to run and hardware specifications for worker nodes to arrive at an approximate number of worker nodes required for your deployment. Due to the complexity of estimating workloads, Cloudera recommends you review any sizing or purchasing decisions with Cloudera Professional Services before committing to those decisions.

How to access the spreadsheet

You can access the spreadsheet here: [CDP Private Cloud Data Services Sizing](#). The file is in Microsoft Excel format. You can open the file in Excel, or upload it to Google Sheets.

There are three tabs in the spreadsheet. You will make your inputs only on the Worker Node Totals tab. Do not modify the following tabs (these tabs contain data used to calculate values in the spreadsheet and should not be modified):

- Component Lookup
- K8s Resources



Important: Do not modify any cells except for the ones indicated below. Modifying the formulas in other cells will result in inaccurate calculations.

Workload inputs

The spreadsheet calculates the total amount vcores, RAM, and storage required based on information you enter about the combined workloads you intend to deploy. Then based on the hardware specifications entered, calculates the number of worker nodes required, which is displayed in cell E24.

The following sections describe values you must enter into the spreadsheet. Values are required for each Data Service you intend to deploy, and values to enter for the hardware specifications for your worker nodes.

Control plane monitoring

Label	Cell	Description
CP Monitoring	B3	Increment this number by one for each environment.

Cloudera Data Warehouse (CDW)

If you will deploy CDW, on the Worker Node Totals tab, enter the following information:

Label	Cell	Description
CDW Data Catalog (min 1 per env)	B5	Enter the number of Data Catalogs you will need in your deployment. You must have at least one Data Catalog.
CDW LLAP warehouses	B6	Enter the number of LLAP warehouses you will need for each Virtual Warehouse in your deployment.
-- LLAP Executors	B7	Enter the total number of LLAP Executors you will need in your deployment.
CDW Impala warehouses	B8	Enter the number of CDW Impala warehouses for each Virtual Warehouse you will need in your deployment.
-- Impala Coordinators (2 x for HA)	B9	Enter the number of Impala Warehouses you will need in your deployment. If you have enabled high availability, enter twice the number of Warehouses.
-- Impala Executors	B10	Enter the number of Impala Executors you will need in your deployment.
CDW Cache	B11	Enter the amount of CDW Cache space for each coordinator and executor (Default 600)
Data Viz - small instances	B12	Enter the size selected when creating a Data Visualization instance.
Data Viz - medium instances	B13	
Data Viz - large instances	B14	

For more information about sizing Cloudera Data Warehouse deployments, see:

- (OCP) [CDE hardware requirements](#).

- (ECS) [Additional resource requirements for Cloudera Data Engineering](#)

Cloudera Machine Learning (CML)

Sizing for a CML deployment depends on the number of concurrent jobs you expect to run and the number of Workspaces you provision.

Label	Cell	Description
CML Workspace (min of 1)	B16	Enter the number of workspaces you need in your deployment.
-- CML Small concurrent sessions	B17	Enter the number of concurrent small-sized sessions you intend to run.
-- CML Average concurrent sessions	B18	Enter the number of concurrent average-sized sessions you intend to run.

For more information about sizing the Cloudera Data Engineering service, see the following topics:

- [Additional resource requirements for Cloudera Machine Learning](#).
- (OCP) [Cloudera Machine Learning requirements](#)
- (ECS) [Cloudera Machine Learning requirements](#)

Cloudera Data Engineering (CDE)

Label	Cell	Description
CDE Service (min/max 1 per cluster)	B20	Enter the number of CDE clusters you will need in your deployment.
CDE Virtual Cluster	B21	Enter the number of CDE Virtual Clusters you will need in your deployment.
-- CDE Small concurrent jobs	B22	Enter the number of concurrent small-sized jobs you intend to run.
-- CDE Average concurrent jobs	B23	Enter the number of concurrent average-sized jobs you intend to run.

For more information about sizing the Cloudera Data Engineering service, see [Additional resource requirements for Cloudera Data Engineering](#).

Worker node hardware specifications

Based on the inputs you supplied for your workloads, the spreadsheet totals the number of vcores, RAM, and storage required for the cluster in cells C20-C26. Then, based on the worker node hardware specifications you enter in cells B26-B29, divides the totals for vcores, RAM and storage by each of the worker node specifications to arrive at the required number of nodes for vcores, RAM and storage shown in cells D5-D29. The final number, in cell E27 chooses the higher value of these cells.

You may notice that the calculated values in cells D26 and D27 are different. This indicates that some nodes are oversubscribed for RAM or vcores. Adjust the hardware specifications for CPU and RAM until the two cells are closer together in value. Changing these values may also change the calculated number of worker nodes.

Label	Cell	Description
CPU recommend 40+ cores (80 vcores)	B27	Enter the number of vcores for each worker node.
RAM (GB) recommend 415 GB RAM	B28	Enter the amount of RAM, in gigabytes, for each worker node.

Label	Cell	Description
Disk (GB) Block (OCP CSI block, ECS Longhorn)	B29	Enter the number of gigabytes Block required for: - OpenShift Container Platform: CSI block - Embedded Container Service: ECS Longhorn
Disk (GB) Fast Cache for CDW (nvme,ssd)	B30	Enter the number of gigabytes of Fast Cache used in Cloudera Data Warehouse.
CP Block Overhead per host (300 to 1024)	B31	Enter the Control Plane block overhead
NFS (GB) (choose 1 from below)	B33	Enter required storage in either cell B34 or cell B35
-- Embedded nfs - (subtract from Block provider) non-prod	B34	Enter the number of gigabytes storage for an embedded NFS.
-- External nfs	B35	Enter the number of gigabytes of storage for an External NFS.
ECS Master Node requires 1 for non HA - 3 for HA If you are using the Embedded Container Service, you will also need to provision a host for the ECS Master Node (a node running the ECS Server component). The values described here contain Cloudera's recommendations for specifications for the ECS Master node.	B38	Minimum: 16 vcores Recommended: 32 vcores
	B39	Minimum: 32 GB RAM Recommended: 64 GB RAM
	B40	Minimum: 300 GB HDD (This amount is adequate for a proof-of-concept cluster.) Recommended: 1 TB HDD

Docker repository access

You must ensure that the cluster has access to the Docker Container Repository in order to retrieve the container images for deployment.

There are several types of Docker Repositories you can use:

Embedded Repository

During installation, a Docker daemon is provisioned to act as the Repository. Passwords and certificates are auto generated. No additional set up is needed. Images are copied to the repository during installation. During upgrades, only the new and changed images are copied. Copying images generally takes one to two hours.

It is important to note that the Embedded Repository can be a single point of failure. If the node that runs the Docker Repository fails or becomes unavailable, some cluster functionalities might become unavailable. Moving the Docker Repository to another node is a complex process and will require engaging Cloudera Professional Services.

Cloudera Repository

Using the Cloudera Repository requires that the cluster have internet connectivity to the Cloudera public repository. Using the Cloudera Repository is the fastest option.

The Cloudera-hosted Docker Repository option may increase the time required to deploy or start the services in the cluster. Cloudera generates Docker Repository credentials that are identical to your payroll credentials. Refer to your welcome letter for the credentials or use the credential generator on cloudera.com to generate credentials from your license key.

This option is best suited for proof-of-concept, non-production deployments or deployments that do not have security requirements that disallow internet access.

Custom Repository

A Custom Repository is a repository that you manage in your environment and can be Enterprise grade and highly available.

During installation and upgrade, a custom script is generated that you use to copy the images. Copying images can take 4 - 5 hours.

Only TLS-enabled custom Docker Registry is supported. Ensure that you use a TLS certificate to secure the custom Docker Registry. The TLS certificate can be self-signed, or signed by a private or public trusted Certificate Authority (CA).



Important: When using an Embedded Container Service cluster, passwords must not contain the \$ character.

CDP Private Cloud Data Services Software Requirements

This release ships with Cloudera Manager 7.11.3 CHF 6. If you have an existing CDP Private Cloud Base cluster set up using an earlier version of Cloudera Manager, you must first upgrade Cloudera Manager to version 7.11.3 CHF 6.

For more information about specific software requirements, see the [Software Support Matrix for ECS](#) on page 4.

Additionally, you must perform the following:

- For CML, you must install `nfs-utils` in order to mount longhorn-nfs provisioned mounts. The `nfs-utils` package is required on every node of the ECS cluster. Run this command `yum install nfs-utils` to install `nfs-utils`.
- If you have nodes with GPU, ensure that the GPU hosts have `nVidia Drivers` and `nvidia-container-runtime` installed. You must confirm that drivers are properly loaded on the host by executing the command `nvidia-smi`. You must also install the `nvidia-container-toolkit` package.
- You must have a minimum of one agent node for ECS.
- Set up Kerberos on these clusters using an Active Directory.
- Enable TLS on the Cloudera Manager cluster for communication with components and services.
- If you do not have entitlements, contact your Cloudera account team to get the necessary entitlements.
- The default docker service uses `/docker` folder. Whether you wish to retain `/docker` or override `/docker` with any other folder, you must have a minimum of 300 GiB free space.
- Ensure that all of the hosts in the ECS cluster have more than 300 GiB of free space in the `/var/lib` directory at the time of installation.
- The cluster generates multiple hosts and host based routing is used in the cluster in order to route it to the right service. You must decide on a domain for the services which Cloudera Manager by default points to one of the host names on the cluster. However, during the installation, you should check the default domain and override the default domain (only if necessary) with what you plan to use as the domain. The default domain must have a wildcard DNS entry. For example, `*.apps.myhostname.com`.
- You must install `nvidia-container-toolkit`. (`nvidia-container-runtime` migrated to `nvidia-container-toolkit`, see [Migration Notice](#).) The steps for this are shown in the [NVIDIA Installation Guide](#). If using Red Hat Enterprise Linux (RHEL), use `dnf` to install the package. For an example with RHEL 8.7, see [Installing the NVIDIA Container Toolkit](#).
- Python 3.8 is required for Cloudera Manager version 7.11.3.0 and higher versions. Cloudera Manager agents will not start unless Python 3.8 is installed on the cluster nodes.

Related Information

[Software Support Matrix for ECS](#)

Installation using the Embedded Container Service (ECS)

Preparing CDP Private Cloud Base

Use Cloudera Manager to configure your Private Cloud Base cluster in preparation for the Private Cloud Data Services installation.

1. Configure the Private Cloud Base cluster to use TLS. [Configuring TLS Encryption for Cloudera Manager Using Auto-TLS](#).
2. Configure Cloudera Manager with a JKS-format (not PKCS12) TLS truststore. [Database requirements](#).
3. Configure Cloudera Manager to include a root certificate that trusts the certificate for all Cloudera Manager server hosts expected to be used with the Private Cloud, LDAP server (if you are using LDAP), and the Postgres DB of all Hive Metastores that you use with Private Cloud. If a single CA is used to sign all of them, then just that single CA must be imported.
 - a. Import the necessary certificates into the truststore configured in Configure Administration > Settings > Security > Cloudera Manager TLS/SSL Client Trust Store File.
4. Enable Kerberos for all the services in the cluster. [Enabling Kerberos for authentication](#).
5. Configure Ranger and LDAP for user authentication. Ensure that you have configured Ranger user synchronization. [Configure Ranger authentication for LDAP](#) and [Ranger usersync](#).
6. Configure LDAP using Cloudera Manager. IPA, Microsoft Active Directory (AD), and OpenLDAP are currently supported. [Configure authentication using an LDAP-compliant identity service](#).
7. Check if all the running services in the cluster are healthy. To check this using Cloudera Manager, go to Cloudera Manager > Clusters > [***CLUSTER NAME***] > Health Issues. If there are no health issues, the No Health Issues message is displayed.
8. If you want to reuse data from your legacy CDH or HDP deployment in your Private Cloud, copy the data from your CDH or HDP deployments into the CDP Private Cloud Base cluster that will be accessed by CDP Private Cloud Data Services. For more information about data migration, see the [Data Migration Guide](#).
9. For installing CDP Private Cloud Base, see [Install CDP Private Cloud Base](#)

CDP Private Cloud Base checklist

Use this checklist to ensure that your CDP Private Cloud Base is configured and ready for installing CDP Private Cloud Data Services.



Note: The Cloudera Manager mentioned in this checklist is the CDP Private Cloud Base Cloudera Manager using which you want to install CDP Private Cloud Data Services.

Table 3: CDP Private Cloud Base checklist to install CDP Private Cloud Data Services

Item	Summary	Documentation	Notes
Runtime components	Ensure that you have Ranger, Atlas, Hive, HDFS, and Ozone installed in your CDP Private Cloud Base cluster.	<ul style="list-style-type: none"> • Software Support Matrix for ECS on page 4 • CDP Private Cloud Base requirements 	If you do not install these components, you see an error when creating an environment in CDP Private Cloud Data Services.
Network requirement	Ensure that all the network routing hops in production. Cloudera recommends not to use more than 4:1 oversubscription between the spine-leaf switches.		

Item	Summary	Documentation	Notes
Cloudera Manager database requirement	Refer to the the CDP Private Cloud Base database requirements.	<ul style="list-style-type: none"> Database Requirements Cloudera Support Matrix 	N/A
Cloudera Manager TLS configuration	Ensure that Cloudera Manager in the CDP Private Cloud Base cluster is configured to use TLS.	Configuring TLS Encryption for Cloudera Manager Using Auto-TLS	You can also manually configure TLS to complete this task. See Manually Configuring TLS Encryption for Cloudera Manager
Cloudera Manager JKS-format TLS truststore	Ensure that the Cloudera Manager is configured with a JKS-format (not PKCS12) TLS truststore.	Obtain and Deploy Keys and Certificates for TLS/SSL	N/A
Cloudera Manager truststore and root certificate	Ensure that the Cloudera Manager truststore contains a root certificate that trusts the certificate for all Cloudera Manager server hosts used with CDP Private Cloud Data Services.	How to Add Root and Intermediate CAs to Truststore for TLS/SSL	Import the necessary certificates into the truststore configured in Configure Administration > Settings > Security > Cloudera Manager TLS/SSL Client Trust Store File .
LDAP configuration	Ensure that you configure LDAP using Cloudera Manager.	N/A	Only Microsoft Active Directory (AD) and OpenLDAP are currently supported.
Apache Ranger configuration for LDAP	Ensure that the CDP Private Cloud Base cluster is configured with Apache Ranger and LDAP for user authentication.	Configure Ranger authentication for LDAP	N/A
Apache Ranger usersync configuration	Ensure that you have configured Apache Ranger and Apache Ranger usersync.	Ranger usersync	Apache Ranger user synchronization is used to get users and groups from the corporate ActiveDirectory to use in policy definitions.
Kerberos configuration	Ensure that Kerberos is enabled for all services in the cluster.	Enabling Kerberos for authentication	Custom Kerberos principals are not currently supported.
Internet access or air gap installation	Ensure that CDP Private Cloud Base and the ECS hosts have access to the Internet. If you do not have access to the Internet, you must do an air gap installation.	Install CDP Private Cloud Data Services in air gap environment	You need access to the Docker registries and the Cloudera repositories during the installation process.
Services health check	Ensure that all services running in the cluster are healthy.	Cloudera Manager Health Tests	N/A
CDP Private Cloud entitlement	Ensure that you have the necessary CDP entitlement from Cloudera to access the Private Cloud installation.	N/A	
Reuse data from CDH or HDP (Optional)	To reuse data from your legacy CDH or HDP deployment in your Private Cloud, ensure that you have migrated that data into your CDP Private Cloud Base. You must be using Cloudera Runtime 7.1.7 for migrating data from your CDH or HDP cluster.	Data Migration Guide	N/A

Item	Summary	Documentation	Notes
(Recommended) Configure HDFS properties to optimize logging	CDP uses “out_webhdfs” Fluentd output plugin to write records into HDFS, in the form of log files, which are then used by different data services to generate diagnostic bundles. To optimize the size of logs that are captured and stored on HDFS, you must update a few HDFS configurations in the hdfs-site.xml file using Cloudera Manager.	Configuring HDFS properties to optimize logging	N/A

Embedded Container Service (ECS) checklist

Use this checklist to ensure that your Embedded Container Service (ECS) is configured and ready for installing CDP Private Cloud Data Services.

Table 4: Embedded Container Service (ECS) checklist to install CDP Private Cloud Data Services

Item	Summary	Documentation	Notes
DNS configuration	Ensure that you have set up the DNS and Reverse DNS between Embedded Container Service (ECS) hosts and CDP Private Cloud Base. This is required for obtaining Kerberos ticket-granting tickets.	N/A	A wildcard DNS entry is required for resolving the ingress route for applications. The ingress route is usually behind a load balancer.
Check that ECS Ingress can be resolved in DNS.	Ensure that Embedded Container Service (ECS) application hostnames can be accessed from outside the cluster. You can test this by creating an ingress point on the target cluster.	The cluster generates multiple hosts and host-based routing is used in the cluster in order to route it to the right service. You must decide on a domain for the services which Cloudera Manager, by default points to one of the hostnames on the cluster. However, during the installation, you should check the default domain and override the default domain (only if necessary) with what you plan to use as the domain. The default domain must have a wildcard DNS entry. For example, *.apps.myhostname.com.	Perform a DNS query on the ingress point, to check if you can access the hostnames outside the cluster.
Clock time from NTP source	Ensure that the NTP clock in CDP Private Cloud Base is in sync with the time configured in the Embedded Container Service (ECS) cluster. This is an important step if your setup does not have access to the Internet.	Enable an NTP Service	Installing CDP Private Cloud Data Services (ECS)
Default subnet created for docker service	The default subnet used by docker is 172.17.0.0/16. Since the IP range within the subnet is used by docker, any internal applications running or using an IP in this range will not be accessible.	Docker documentation	Ensure 172.17.0.0/16 IP range is not used by other applications or services, to avoid conflicts with the docker subnet. You can use a different subnet for docker if needed.

Adding a CDP Private Cloud Data Services cluster

Using Cloudera Manager 7.11.3 CHF 6, you can either install Private Cloud Data Services by downloading the repository from the Internet, or you can do an air gap installation if Cloudera Manager does not have access to the Internet.

Before you begin:



Important:

RHEL 7.x support on ECS has been dropped in CDP Private Cloud Data Services 1.5.4 and higher versions. If you are running RHEL 7.x, you must upgrade to a higher version before installing CDP Private Cloud Data Services.

- Ensure that you have Cloudera Manager 7.11.3 CHF 6 installed and you have the entitlements to the CDP Private Cloud Data Services product.
- Python 3.8 is required for Cloudera Manager version 7.11.3.0 and higher versions. Cloudera Manager agents will not start unless Python 3.8 is installed on the cluster nodes.
- Only TLS 1.2 is supported for authentication with Active Directory/LDAP. You require TLS 1.2 to authenticate the CDP control plane with your LDAP directory service like Active Directory.
- The Kubeconfig file is available in `/etc/rancher/rke2/rke2.yaml`
- If the installer fails, do not cancel the installation. For more information, see [Manually uninstalling ECS from a cluster](#).
- Do not use any antivirus or other security tools on the ECS nodes. These third-party tools may cause issues with ECS functionality.

Installing CDP Private Cloud Data Services using ECS

Follow the steps in this topic to install CDP Private Cloud Data Services with the Embedded Container Service (ECS).

About this task



Important:

RHEL 7.x support on ECS has been dropped in CDP Private Cloud Data Services 1.5.4 and higher versions. If you are running RHEL 7.x, you must upgrade to a higher version before installing CDP Private Cloud Data Services.

Procedure

1. If you are installing ECS on RHEL 8 or RHEL 9:

- a) Run the following command to check to see if the `nm-cloud-setup.service` and `nm-cloud-setup.timer` services are enabled:

```
systemctl status nm-cloud-setup.service nm-cloud-setup.timer
```

- b) If the `nm-cloud-setup.service` and `nm-cloud-setup.timer` services are enabled, disable them by running the following command on each host you added:

```
systemctl disable nm-cloud-setup.service nm-cloud-setup.timer
```

For more information, see [Known issues and limitations](#).

- c) If you disabled the `nm-cloud-setup.service` and `nm-cloud-setup.timer` services, reboot the added hosts.

2. In Cloudera Manager, click Data Services in the left menu.

The screenshot shows the Cloudera Manager interface. On the left, the 'Data Services' menu item is highlighted with a blue box and a 'New' badge. The main content area displays 'Cluster 1' with a list of services:

Service Name	Status	Issues
Cloudera Runtime 7.1.9 (Parcels)	✓	
3 Hosts	✓	2
ATLAS-1	✓	
CORE_SETTINGS-1	○	
CRUISE_CONTROL-1	✓	
HBASE-1	✓	1
HDFS-1	✓	1
HIVE-1	✓	1
HIVE_ON_TEZ-1	✓	1
HUE-1	✓	

On the right, there are two charts: 'Cluster CPU' showing usage across hosts at 14.2%, and 'Cluster Disk IO' showing total disk bytes at 32M/s.

The Add Private Cloud Containerized Cluster page appears. Click Continue.

The screenshot shows the 'Add Private Cloud Containerized Cluster' page. The main heading is 'Add Private Cloud Containerized Cluster'. Below it, there is a diagram of a cluster and a 'Continue' button. The text on the page reads:

Private Cloud Containerized Cluster New

Add a Private Cloud Containerized Cluster to access our latest data analytic data services on a container cloud with separated compute and storage.

[Selected](#)

CDP Private Cloud is a next-generation data platform with container-native, self-service analytic data services bringing the speed, scale, and economics of the cloud to on-premise data centers.

Click **Continue** to add a CDP Private Cloud Containerized Cluster, accessing data stored in HDFS or Ozone on an existing storage cluster running Cloudera Runtime 7.x. This cluster will be managed by this Cloudera Manager instance.

Other Options

Click [here](#) to install the same CDP Private Cloud Data Services as above, but in a separately provisioned and managed container application platform such as OpenShift. Cloudera Manager will not be managing this OpenShift instance.

At the bottom right, there are 'Back' and 'Continue' buttons, with 'Continue' highlighted by a blue box.



Note: You can also click **Add Add Cluster** at the top right in Cloudera Manager, then select **Private Cloud Containerized Cluster** as the cluster type.

3. On the Getting Started page of the installation wizard, select Internet or Air Gapped as the Install Method.

Internet install method (To use a custom repository link provided to you by Cloudera, click Custom Repository) :

Add Private Cloud Containerized Cluster CDP Deployment from 2024-APR-22 12:02

- 1 Getting Started
- 2 Cluster Basics
- 3 Specify Hosts
- 4 Assign Roles
- 5 Configure Docker Repository
- 6 Configure Data Services
- 7 Configure Databases
- 8 Install Parcels
- 9 Check Prerequisites
- 10 Inspect Cluster
- 11 Install Data Services
- 12 Summary

Getting Started

This wizard provides step-by-step guidance for installing CDP Private Cloud Containerized cluster.

Installation of the CDP Private Cloud Data Services components (for trial purposes or for production use) requires an appropriate license key.

Visit the [CDP Private Cloud Installation](#) documentation for more information.

Install Method

Internet Air Gapped

1. Select Repository

Custom Repository

You are about to install CDP Private Cloud Data Services version 1.5.4-1.

What's new in version 1.5.4-1.

- [Release Notes](#)
- RHEL 7.x support has been removed for CDP Private Cloud Data Services 1.5.4 and above. Please ensure that prior to upgrading the Data Services Cluster, an OS upgrade is performed first. Installations and upgrades will fail for CDP Private Cloud Data Services if the OS requirement is not met. Please note that this restriction applies to ECS deployment of Data Services only.

Cancel
← Back
Continue →

If you select the Air Gapped install option, extra steps are displayed. Follow these steps to download and mirror the Cloudera archive URL using a local HTTP server.

- a. Download everything under <https://archive.cloudera.com/p/cdp-pvc-ds/latest>

```
wget -l 0 --recursive --no-parent -e robots=off -nH --cut-dirs=2 --reject="index.html*" -t 10 https://<username>:<password>@archive.cloudera.com/p/cdp-pvc-ds/latest
```

- b. Edit the manifest.json file in the downloaded directory. Change "http_url": "..." to

```
"http_url": "http://your_local_repo/cdp-pvc-ds/latest"
```

- c. Mirror the downloaded directory to your local http server, e.g. http://your_local_repo/cdp-pvc-ds/latest
- d. Click Custom Repository and add http://your_local_repo/cdp-pvc-ds/latest as a custom repository.
- e. Click the Select Repository drop-down and select http://your_local_repo/cdp-pvc-ds/latest

Add Private Cloud Containerized Cluster

CDEP Deployment from 2024-Apr-22 12:02

- 1 Getting Started**
- 2 Cluster Basics
- 3 Specify Hosts
- 4 Assign Roles
- 5 Configure Docker Repository
- 6 Configure Data Services
- 7 Configure Databases
- 8 Install Parcels
- 9 Check Prerequisites
- 10 Inspect Cluster
- 11 Install Data Services
- 12 Summary

Getting Started

This wizard provides step-by-step guidance for installing CDP Private Cloud Containerized cluster.

Installation of the CDP Private Cloud Data Services components (for trial purposes or for production use) requires an appropriate license key.

Visit the [CDP Private Cloud Installation](#) documentation for more information.

Install Method

Internet Air Gapped

Installing via a local mirror with an http server. You will need to setup a full mirror of Cloudera's repositories via a temporary http server within the perimeter network of all hosts.

- Download everything under `https://archive.cloudera.com/p/cdp-pvc-ds/latest`

```
$ wget -l 0 --recursive --no-parent -e robots=off -nH --cut-dirs=2 --reject="index.html*" -t 10 https://<username>:<password>@archive.cloudera.com/p/cdp-pvc-ds/latest
```

- Modify the file `manifest.json` inside the downloaded directory, change `"http_url": "..."` to `"http_url": "http://your_local_repo/cdp-pvc-ds/latest"`
- Mirror the downloaded directory to your local http server, e.g. `http://your_local_repo/cdp-pvc-ds/latest`
- Add `http://your_local_repo/cdp-pvc-ds/latest` to your [Custom Repository](#) settings and select it from the dropdown below.
- Select Repository

Custom Repository

You are about to install CDP Private Cloud Data Services version **1.5.4-1000**.

What's new in version **1.5.4-1000**.

Cancel

← Back
Continue →

Click Continue.

- On the Cluster Basics page, type a name for the Private Cloud cluster that you want to create in the Cluster Name field. From the Base Cluster drop-down list, select the cluster that has the storage and SDX services that you want this new Private Cloud Data Services instance to connect with. Click Continue.


CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- Getting Started
- 2 Cluster Basics**
- 3 Specify Hosts
- 4 Assign Roles
- 5 Configure Docker Repository
- 6 Configure Data Services
- 7 Configure Databases
- 8 Install Parcels
- 9 Check Prerequisites
- 10 Inspect Cluster
- 11 Install Data Services
- 12 Summary

Cluster Basics

Cluster Name



Private Cloud Containerized Cluster

A Private Cloud Containerized Cluster helps you to install and run CDP Private Cloud Data Services such as Machine Learning and Data Warehouse with data from an existing Base Cluster. Learn more at [CDP Private Cloud Containerized Cluster](#).

Base Cluster

Use Default Configuration
Use embedded Docker Repository, Vault and Database with default settings, and use default configurations for Role Assignments. Not recommended for production.

[Cancel](#) [← Back](#) [Continue →](#)

5. On the Specify Hosts page, hosts that have already been added to Cloudera Manager are listed on the Currently Managed Hosts tab. You can select one or more of these hosts to add to the ECS cluster.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- 3 Specify Hosts**
- 4 Assign Roles
- 5 Configure Docker Repository
- 6 Configure Data Services
- 7 Configure Databases
- 8 Install Parcels
- 9 Check Prerequisites
- 10 Inspect Cluster
- 11 Install Data Services
- 12 Summary

Specify Hosts

Currently Managed Hosts (3/3 Selected) New Hosts

These hosts do not belong to any clusters. Select some to form your cluster.

<input checked="" type="checkbox"/> Hostname (FQDN) ↑	IP Address	Rack	Version	Cores
<input checked="" type="checkbox"/> ecsxm-1.vpc.cloudera.com	10.65.219.71	/default	None	8
<input checked="" type="checkbox"/> ecsxm-2.vpc.cloudera.com	10.65.215.116	/default	None	8
<input checked="" type="checkbox"/> ecsxm-3.vpc.cloudera.com	10.65.213.166	/default	None	8

1 - 3 of 3

Cancel
← Back
Continue →

You can also click the New Hosts tab to specify one or more hosts that have not been added to Cloudera Manager. Enter a Fully Qualified Domain Name in the Hostname box, then click Search.



Note: Click the pattern link under the Hostname box to display more information about allowed FQDN patterns.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- 3 Specify Hosts**
- 4 Select JDK
- 5 Enter Login Credentials
- 6 Install Agents
- 7 Assign Roles
- 8 Configure Docker Repository
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services

Specify Hosts

Currently Managed Hosts (0/3 Selected) [New Hosts \(3 Selected\)](#)

Hosts should be specified using the same hostname (FQDN) that they will identify themselves with.

Hostname

Hint: Search for hostnames or IP addresses using [pattern](#)

SSH Port

3 hosts scanned, 3 running SSH.

<input checked="" type="checkbox"/>	Expanded Query	Hostname (FQDN) ↑	IP Address	Currently Managed	Result
<input checked="" type="checkbox"/>	ecsx-1.vpc.cloudera.com	ecsx-1.vpc.cloudera.com	10.65.204.178	No	Host was successfully scanned.
<input checked="" type="checkbox"/>	ecsx-2.vpc.cloudera.com	ecsx-2.vpc.cloudera.com	10.65.200.92	No	Host was successfully scanned.
<input checked="" type="checkbox"/>	ecsx-3.vpc.cloudera.com	ecsx-3.vpc.cloudera.com	10.65.207.200	No	Host was successfully scanned.

1 - 3 of 3

After you have finished specifying the ECS hosts, click Continue.

6. On the Select JDK page, select any one from the below options:
- Manually manage JDK
 - Install a Cloudera-provided version of OpenJDK
 - Install a system-provided version of OpenJDK

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- 4 Select JDK
- 5 Enter Login Credentials
- 6 Install Agents
- 7 Assign Roles
- 8 Configure Docker Repository
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Select JDK

CDH Version	Supported JDK Version
7.1.9 and above	OpenJDK 8, 11, 17 or Oracle JDK 8, 11, 17
7.1.1 to 7.1.8	OpenJDK 8, 11 or Oracle JDK 8, 11
7.0 and above	OpenJDK 8 or Oracle JDK 8
6.3 and above	OpenJDK 8 or Oracle JDK 8
6.2	OpenJDK 8 or Oracle JDK 8
6.1 or 6.0	Oracle JDK 8
5.16 and above	OpenJDK 8 or Oracle JDK 8
5.7 to 5.15	Oracle JDK 8

1 - 8 of 8 [More details on supported JDK version.](#)

If you plan to use JDK 11 with CDH 7.1.x and above or JDK 17 with CDH 7.1.9 and above , you will need to install it manually on all hosts and then select the **Manually manage JDK** option below.

Manually manage JDK

i Please ensure that a supported JDK is **already installed** on all hosts. You will need to manage installing the unlimited strength JCE policy file, if necessary.

Install a Cloudera-provided version of OpenJDK

By proceeding, Cloudera will install a supported version of OpenJDK version 8.

Install a system-provided version of OpenJDK

By proceeding, Cloudera will install the default version of OpenJDK version 8 provided by the Operating System.

Cancel
← Back
Continue →

- On the Enter Login Credentials page, All hosts accept the same password is selected by default. Enter the user name in the SSH Username box, and type in and confirm the password. You can also select the All hosts accept the same private key option and provide the Private Key and passphrase.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- 5 Enter Login Credentials**
- 6 Install Agents
- 7 Assign Roles
- 8 Configure Docker Repository
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Enter Login Credentials

Root access to your hosts is required to install the Cloudera packages. This installer will connect to your hosts via SSH and log in either directly as root or as another user with password-less sudo/pbrun privileges to become root.

SSH Username

Authentication Method All hosts accept same password
 All hosts accept same private key

Password

Confirm Password

SSH Port

Simultaneous Installations
(Running a large number of installations at once can consume large amounts of network bandwidth and other system resources)

[Cancel](#) [← Back](#) [Continue →](#)

8. The Install Agents page appears and displays a progress indicator as the agent packages are installed.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- ✓ Select JDK
- ✓ Enter Login Credentials
- 6 Install Agents**
- 7 Assign Roles
- 8 Configure Docker Repository
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Install Agents

Installation in progress.

0 of 3 host(s) completed successfully. [Abort Installation](#)

Hostname	IP Address	Progress	Status
ecsx-1.vpc.cloudera.com	10.65.204.178	<div style="background-color: #0070C0; width: 100%; height: 10px;"></div>	⌚ Installing cloudera-manager-agent package... Details
ecsx-2.vpc.cloudera.com	10.65.200.92	<div style="background-color: #0070C0; width: 100%; height: 10px;"></div>	⌚ Installing cloudera-manager-agent package... Details
ecsx-3.vpc.cloudera.com	10.65.207.200	<div style="background-color: #0070C0; width: 100%; height: 10px;"></div>	⌚ Installing cloudera-manager-agent package... Details

1 - 3 of 3

[Cancel](#)[← Back](#)[Continue →](#)

9. On the Assign Roles page, you can customize the roles assignment for your new Private Cloud Containerized cluster.



Important: Cloudera does not recommend altering assignments unless you have specific requirements such as having selected a specific host for a specific role.

CDP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- ✓ Select JDK
- ✓ Enter Login Credentials
- ✓ Install Agents
- 7 **Assign Roles**
- 8 Configure Docker Repository
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Assign Roles

You can customize the role assignments for your new cluster here, but if assignments are made incorrectly, such as assigning too many roles to a single host, this can impact the performance of your services. Cloudera does not recommend altering assignments unless you have specific requirements, such as having pre-selected a specific host for a specific role.

You can also view the role assignments by host. [View By Host](#)

DOCKER

Docker Server × 1 New

ecsx-3.vpc.cloudera.com

ECS

Ecs Server × 1 New

ecsx-1.vpc.cloudera.com

Ecs Agent × 2 New

ecsx-[2-3].vpc.cloudera.com

Cancel
← Back
Continue →

Single node ECS installation is supported, but is only intended to enable CDSW to CML migration. If you are installing ECS on a single node, only the Docker and ECS Server roles are assigned. The ECS Agent role is not required for single node installation.

Click Continue.

10. Configure a Docker Repository.

There are several options for configuring a Docker Repository. For more information about these options, see [Docker repository access](#) on page 11.

The following ports must be opened and allowed no matter which Docker repository option you choose.

- Ports required for Cloudera Manager/Cloudera Manager agent (port 5000 is required for Cloudera Machine Learning):

Protocol	Port
TCP	7180-7192
TCP	19001
TCP	5000
TCP	9000

- Inbound rules for ECS Server nodes (Kubernetes/RKE2):

Protocol	Port
TCP	9345
TCP	6443
UDP	8472
TCP	10250
TCP	2379
TCP	2380
TCP	30000-32767

- Inbound Rules for the ECS Agent (Kubernetes/RKE2):

Protocol	Port
UDP	4789

On the Configure Docker Repository page, select one of these options:

- Embedded Docker Repository

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- ✓ Select JDK
- ✓ Enter Login Credentials
- ✓ Install Agents
- ✓ Assign Roles
- 8 **Configure Docker Repository**
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Configure Docker Repository

Cloudera uses a Docker Repository to deliver CDP Private Cloud Data Services. [Learn more](#) about how to set up custom Docker Repository for CDP Private Cloud Data Services.

Use an embedded Docker Repository
 Use Cloudera's default Docker Repository
 Use a custom Docker Repository

This release comes with 301 container images that need to be deployed to the Docker repository. Some images are optional and can be skipped by toggling them from the list below. Other images are always installed.

Default Select the Optional Images

Cloudera Machine Learning
 Docker images required to create a Cloudera Machine Learning workspace. Without these images, it will not be possible to use Cloudera Machine Learning.

The system will deploy 301 container images, approximately 173 GiB, to the embedded Docker repository.

Cancel
← Back
Continue →

If you select the Internet Install Method option on the Getting Started page, images are copied over the internet from the Cloudera repository.

If you select the Air Gapped option, images are copied from a local http mirror you have set up in your environment.

Select Default to deploy all of the default Docker images to the repository, or select Select the Optional Images to choose which images to deploy. If you will be deploying Cloudera Machine Learning (CML), toggle the Cloudera Machine Learning switch on to copy the images for CML.

- Cloudera default Docker Repository

This option requires that cluster hosts have access to the internet and you have selected Internet as the install method.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

Getting Started

Cluster Basics

Specify Hosts

Select JDK

Enter Login Credentials

Install Agents

Assign Roles

8 Configure Docker Repository

9 Configure Data Services

10 Configure Databases

11 Install Parcels

12 Check Prerequisites

13 Inspect Cluster

14 Install Data Services

15 Summary

Configure Docker Repository

Cloudera uses a Docker Repository to deliver CDP Private Cloud Data Services. [Learn more](#) about how to set up custom Docker Repository for CDP Private Cloud Data Services.

Use an embedded Docker Repository

Use Cloudera's default Docker Repository

Use a custom Docker Repository

Cancel ← Back Continue →

- Custom Docker Repository

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- ✓ Select JDK
- ✓ Enter Login Credentials
- ✓ Install Agents
- ✓ Assign Roles
- 8 **Configure Docker Repository**
- 9 Configure Data Services
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Configure Docker Repository

Cloudera uses a Docker Repository to deliver CDP Private Cloud Data Services. [Learn more](#) about how to set up custom Docker Repository for CDP Private Cloud Data Services.

Use an embedded Docker Repository
 Use Cloudera's default Docker Repository
 Use a custom Docker Repository

Custom Docker Repository ⓘ

Prepare your Docker Repository from a machine that is running Docker locally and has access to all the Docker images either directly from Cloudera or from a local http mirror in your network. If your custom repository already has all the Docker images for this version, this section can be skipped.

1. [Generate the copy-docker script](#)
2. Optionally, review the script. The file contains usage information and lists the Docker images that it will download and push.
3. Login to your custom Docker Registry and run the script with the following commands (Note: this downloads 100+ Docker images and it will take a while):

```
docker login <your_custom_registry> -u <user_with_write_access>
bash copy-docker.txt
```

I confirm that I have downloaded all the Docker images to my custom Docker Repository.

Docker Username ⓘ

Docker Password ⓘ

Docker Certificate ⓘ

[Choose File](#)

[Cancel](#)
[← Back](#)
[Continue →](#)

This option requires that you set up a Docker Repository in your environment and that all cluster hosts have connectivity to the repository.



Note: If you are installing ECS on a single node, you should select the Use a Custom Docker Repository option. Single node ECS installation is supported, but is only intended to enable CDSW to CML migration.

You must enter the following options:

- Custom Docker Repository – Enter the URL for your Docker Repository
- Docker Username – Enter the username for the Docker Repository.
- Docker Password – Enter the password for the Docker Repository.



Important: Do not use the \$ character for this password.

- Docker Certificate – Click the Choose File button to upload a TLS certificate to secure communications with the Docker Repository.

Click the Generate the copy-docker script button to generate and download a script that copies the Docker images from Cloudera, or (for air-gapped installation) from a local http mirror in your network.

Run the script from a machine that is running Docker locally and has access to the Docker images using the following commands:

```
docker login [***URL for Docker Repository***] -u [***username of user  
with write access***]  
  
bash copy-docker.txt
```

The copying operation may take 4 - 5 hours.

11. On the Configure Data Services page, you can modify configuration settings such as the data storage directory, number of replicas, and so on. If there are multiple disks mounted on each host with different characteristics (HDD and SSD), then Local Path Storage Directory must point to the path belonging to the optimal storage. Ensure that you have reviewed your changes. If you want to specify a custom certificate, place the certificate and the private key in a specific location on the Cloudera Manager server host and specify the paths in the input boxes

labelled as Ingress Controller TLS/SSL Server Certificate/Private Key File below. This certificate will be copied to the Control Plane during the installation process.



Note:

The "Ingress Controller TLS/SSL Server Certificate File (PEM Format)" must only contain -----BEGIN CERTIFICATE----- through -----END CERTIFICATE----- (inclusive) for the server and CA certs. It cannot include any preamble text and, and must not include a private key.

The "Ingress Controller TLS/SSL Server Private Key File (PEM Format)" must only contain the unencrypted key, and only the header through the footer, with no preamble text.

Both of these files must be readable by the "cloudera-scm" account.

For information on the required entries that must be present in DNS and TLS certificates when not using wildcards, refer to 'No Wildcard DNS/TLS Setup'

Click Continue.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
- Install Agents
- Assign Roles
- Configure Docker Repository
- Configure Data Services**
- 10 Configure Databases
- 11 Install Parcels
- 12 Check Prerequisites
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Configure Data Services

The Private Cloud Containerized Cluster needs to act as a TLS/SSL Server. By default, Cloudera Manager generates a self-signed certificate and uses it for all communication for example from the browser to the Private Cloud Containerized Cluster using TLS. If you want to specify a custom certificate, place the certificate and the private key in a specific location on the Cloudera Manager server host and specify the paths in the input boxes labelled as Ingress Controller TLS/SSL Server Certificate/Private Key File, below. This certificate must be valid for the application domain and one level underneath it. For example, if your application domain is 'apps.example.com', you must provide a wildcard certificate '*.apps.example.com' The certificate will be copied to the Private Cloud Containerized Cluster during the installation process.

Data Storage Directory	DOCKER (Service-Wide) ⓘ
defaultDataPath	<input type="text" value="/docker"/>
Edit Individual Values	
defaultDataPath	ECS (Service-Wide) ⓘ
	<input type="text" value="/ecs/longhorn-storage"/>
Application Domain	ECS (Service-Wide) ⓘ
app_domain	<input type="text" value="ecsx-1.vpc.cloudera.com"/>
app_domain	
Local Path Storage Directory	ECS (Service-Wide) ⓘ
isoDataPath	<input type="text" value="/ecs/local-storage"/>
isoDataPath	
Number of Replicas	ECS (Service-Wide) ⓘ
longhorn_replication	<input type="text"/>
longhorn_replication	
Number of replicas	ECS (Service-Wide) ⓘ
target_redundancy	<input type="text" value="2"/>
target_redundancy	
Use internal alias for registry	<input type="checkbox"/> ECS (Service-Wide) ⓘ
internal_mirror	
Cluster Signing Duration	ECS (Service-Wide) ⓘ
cluster_signing_duration	<input type="text" value="365"/>
Cluster IP Range	ECS (Service-Wide) ⓘ
cluster_cidr	<input type="text" value="10.42.0.0/16"/>
cluster_cidr	
Service IP Range	ECS (Service-Wide) ⓘ
service_cidr	<input type="text" value="10.43.0.0/16"/>
service_cidr	

Cancel
← Back
Continue →

12. On the Configure Databases page, click Continue.

CDEP Deployment from 2024-Apr-22 12:02

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
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- 10 Configure Databases**
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- 13 Inspect Cluster
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Configure Databases

CDP Private Cloud Control Plane uses an embedded Database to store configuration and other metadata information for the cluster being managed.

Embedded Database Disk Space (GiB) ⓘ

[Cancel](#) [← Back](#) [Continue →](#)

13. On the Install Parcels page, the selected parcel is downloaded to the Cloudera Manager server host, distributed, unpacked, and activated on the ECS cluster hosts. Click Continue.

The screenshot shows the 'Install Parcels' page in Cloudera Manager. The left sidebar contains a navigation menu with steps 1 through 15. Step 11, 'Install Parcels', is currently active. The main content area displays the progress of installing the 'Embedded Container Service 1.5.4' parcel. The progress bar shows 'Downloaded: 100%', 'Distributed: ...', 'Unpacked: 3/3', and 'Activated: 3/3'. Below the progress bar, there are radio buttons for 'All (3)', 'Running (0)', 'Failed (0)', and 'Completed (3)'. A table shows the status of three hosts:

Hostname	Throughput	Status	Errors
tina-rhel89-2.vpc.cloudera.com	79.3 MIB/s	UNPACKING	
tina-rhel89-1.vpc.cloudera.com	89.1 MIB/s	UNPACKING	
tina-rhel89-3.vpc.cloudera.com	79.2 MIB/s	UNPACKING	

At the bottom of the page, there are 'Cancel', 'Back', and 'Continue' buttons.

14. If the hosts do not meet the prerequisites, the Check Prerequisites page displays the applicable issues. Correct the issues, then click Run Again. After all of the issues have been resolved, click Continue.

The following prerequisites are checked:

Host Prerequisite Inspection	Validation
StorageInspection	Checks for a minimum of 300GiB space in the /var/lib and docker data directories. Checks if /var/lib/longhorn or its parent directories are symlinked. If they are, this inspection will fail.
CPUInspection	Checks to make sure the hosts have 16 virtual cores.
PortsInspection	Checks for the availability of ports 443 and 80.

EcsHostDnsInspection	<p>Checks to make sure there are less than 3 nameserver entries in the <code>/etc/resolv.conf</code> file, and checks the connections to the Cloudera Manager cluster and the CDP console. It also checks to see if <code>vault.localhost.localdomain</code>'s ping can be resolved. If not, it is likely that the host <code>/etc/nsswitch.conf</code> file is misconfigured.</p> <p>If this inspection fails:</p> <ul style="list-style-type: none">• Check the <code>/etc/resolv.conf</code> and <code>/etc/nsswitch.conf</code> files and ensure that <code>/etc/resolv.conf</code> does not contain 3 or more nameservers, and that <code>/etc/nsswitch.conf</code> does not contain <code>myhostname</code> under the <code>hosts</code> field.• Check to see if the connections were resolved correctly. If connection to the CDP console fails, check to see if your DNS wildcard is configured properly.
VersionInspection	Checks that Java is installed and consistent among all ECS hosts.
IPTablesInspection	<p>Checks that if the <code>iptables</code> command exists, rules are cleared. If the <code>iptables</code> command does not exist, <code>iptables</code> gets installed during <code>FirstRun</code> so this inspection passes.</p> <p>If <code>iptables</code> are installed and the rules are not cleared, this inspection will fail.</p>

EcsCleanupHostInspection

Checks to make sure that the /var/lib/rancher and docker data directories do not contain any files.

CDEP Deployment from 2024-Apr-23 12:43

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
- Install Agents
- Assign Roles
- Configure Docker Repository
- Configure Data Services
- Configure Databases
- Install Parcels
- 12 Check Prerequisites**
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Check Prerequisites

We are verifying if your hosts meet minimum storage, ports, cpu, and network requirements. The minimum requirements must be met before proceeding.

✖ Host Prerequisites

Error(s) were detected, review the inspector results and correct the problems found. Once corrected, please run the inspections again.

Status **Finished** Last Run a few seconds ago Duration 7.56s [Show Inspector Results](#) [Run Again](#)

[More](#)

Status	Description
!	A minimum of 16 cores are required for the hosts in a Private Cloud Containerized Cluster. The following hosts do not satisfy the minimum number of cores: View Details

[Cancel](#) [← Back](#) [Continue →](#)

7.9.5 (#36767575 UP TO 7.11.3.1 (#52405469 DOWN TO 7.9.5 (#36767575 UP TO 7.11.3.9 (#52290838

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
- Install Agents
- Assign Roles
- Configure Docker Repository
- Configure Data Services
- Configure Databases
- Install Parcels
- 12 Check Prerequisites**
- 13 Inspect Cluster
- 14 Install Data Services
- 15 Summary

Check Prerequisites

We are verifying if your hosts meet minimum storage, ports, cpu, and network requirements. The minimum requirements must be met before proceeding.

✔ Host Prerequisites

No issues were detected, review the inspector results to see what checks were performed.

Status **✔ Finished** Last Run a few seconds ago Duration 7.95s [Show Inspector Results](#) [Run Again](#) [More](#)

Cancel [← Back](#) [Continue →](#)

15. On the Inspect Cluster page, click Inspect Hosts and Inspect Network Performance to inspect your hosts and network performance. If the Inspect tool displays any issues, you can fix those issues and click Run Again to rerun the inspections. After all of the issues have been resolved, click Continue.

**Note:**

These inspections are more comprehensive host and network tests that you can optionally run. To skip these tests, select the I understand the risks of not running the inspections or the detected issues, let me continue with cluster setup checkbox.

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
- Install Agents
- Assign Roles
- Configure Docker Repository
- Configure Data Services
- Configure Databases
- Install Parcels
- Check Prerequisites
- 13 Inspect Cluster**
- 14 Install Data Services
- 15 Summary

Inspect Cluster

You have created a new empty cluster. Here are additional inspections Cloudera recommends you to run. For accurate measurements, Cloudera recommends that they are performed sequentially.

✖ Host Inspector

Error(s) were detected, review the inspector results and correct the problems found.

Status ● **Finished** Last Run a few seconds ago Duration 5.74s [Show Inspector Results](#) [Run Again](#) [More](#)

Status	Description
❌	Starting with CDH 6, Hue requires Python version 2.7. This warning can be ignored if hosts will not be running CDH 6. The following hosts do not satisfy this requirement: View Details tina-rhel89-[1-3].vpc.cloudera.com
❌	The hosts in a Private Cloud Containerized Cluster that have GPUs are required to have nVidia Drivers and nvidia-container-runtime installed. The following hosts do not satisfy this requirement: View Details tina-rhel89-[1-3].vpc.cloudera.com

✔ Network Performance Inspections

[Advanced Options](#)

Status ● **Finished** Last Run a few seconds ago Duration 10.18s [Show Inspector Results](#) [Run Again](#) [More](#)

Tested within **Containerized Cluster 1:**

✔ Latency Test [?](#)

Minimum	Average	Maximum
0.09ms	0.13ms	0.17ms

I understand the risks of not running the inspections or the detected issues, let me continue with cluster setup.

[Cancel](#)
[← Back](#)
[Continue →](#)

16. The installation progress is displayed on the Install Data Services page. When the installation is complete, click Continue.

CDEP Deployment from 2024-Apr-23 12:43

Add Private Cloud Containerized Cluster

- Getting Started
- Cluster Basics
- Specify Hosts
- Select JDK
- Enter Login Credentials
- Install Agents
- Assign Roles
- Configure Docker Repository
- Configure Data Services
- Configure Databases
- Install Parcels
- Check Prerequisites
- Inspect Cluster
- 14 Install Data Services**
- 15 Summary

Install Data Services

First Run Command

Status ✔ **Finished** Context [Containerized Cluster 1.5.4](#) 📅 Apr 24, 6:46:03 PM ⌚ 17.8m

Finished First Run of the following services successfully: DOCKER, ECS.

✔ **Completed 1 of 1 step(s).**

Show All Steps Show Only Failed Steps Show Only Running Steps

✔ Run a set of services for the first time. Successfully completed 1 steps.	Apr 24, 6:46:03 PM	17.8m
✔ Execute 2 steps in sequence Successfully completed 1 steps.	Apr 24, 6:46:03 PM	17.8m
✔ Start DOCKER	Apr 24, 6:46:03 PM	47.21s
✔ Start ECS	Apr 24, 6:46:51 PM	17m

Cancel

← Back
Continue →


17. When the installation is complete, the Summary page appears. Click Launch CDP Private Cloud. You can also click Finish and then access the Data Services cluster from Cloudera Manager.

CDEP Deployment from 2024-Apr-23 12:43

Add Private Cloud Containerized Cluster

- ✓ Getting Started
- ✓ Cluster Basics
- ✓ Specify Hosts
- ✓ Select JDK
- ✓ Enter Login Credentials
- ✓ Install Agents
- ✓ Assign Roles
- ✓ Configure Docker Repository
- ✓ Configure Data Services
- ✓ Configure Databases
- ✓ Install Parcels
- ✓ Check Prerequisites
- ✓ Inspect Cluster
- ✓ Install Data Services
- 15
 Summary

Summary



Congratulations, you have successfully installed CDP Private Cloud Management Console.

Launch CDP Private Cloud

Click **Finish** to exit the wizard. You can also access links to CDP Private Cloud Data Services from Home -> Data Services.
The default login is admin/admin.

Cancel
← Back
Finish →

18. When the installation is complete, you can access your Private Cloud Data Services instance from Cloudera Manager. Click Data Services, then click Open Private Cloud Data Services for the applicable Data Services cluster.

If the installation fails, and you see the following error message in the stderr output during the Install Longhorn UI step, retry the installation by clicking the Resume button.

```
++ openssl passwd -stdin -apr1 + echo 'cm-longhorn:$apr1$gp2nrbtq$1KYPGIOQN1
FJ21o5sV6210' + kubectl -n longhorn-system create secret generic basic-auth
--from-file=auth + rm -f auth + kubectl -n longhorn-system apply -f /opt/cloudera/cm-agent/service/ecs/longhorn-ingress.yaml Error from server (Internal
Error): error when creating "/opt/cloudera/cm-agent/service/ecs/longhorn-ingress.yaml":
Internal error occurred: failed calling webhook "validate.nginx.ingress.kubernetes.io": Post "https://rke2-ingress-nginx-controller-admission.kube-system.svc:443/networking/v1/ingresses?timeout=10s": x509: certificate signed by
unknown authority
```


What to do next

- If you specified a custom certificate, select the ECS cluster in Cloudera Manager, then select Actions > Update Ingress Controller. This command copies the cert.pem and key.pem files from the Cloudera Manager server host to the ECS Management Console host.
- Click Open Private Cloud Data Services to launch your CDP Private Cloud Data Services instance.
- Log in using the default username and password admin.
- On the Welcome to CDP Private Cloud page, click Change Password to change the Local Administrator Account password.
- Set up external authentication using the URL of the LDAP server and a CA certificate of your secure LDAP. Follow the instructions on the Welcome to CDP Private Cloud page to complete this step.
- Click Test Connection to ensure that you are able to connect to the configured LDAP server.
- [Create your first Virtual Warehouse in the CDW Data Service](#)
- [Provision an ML Workspace in the CML Data Service](#)
- [Add a CDE service in the CDE Data Service](#)

Related Information

[No Wildcard DNS/TLS Setup](#)

ECS Server High Availability

ECS Server High Availability (HA) is not enabled by default – you must enable it after installing ECS. If you do not wish to enable ECS HA, you can safely ignore this section. If you are enabling ECS HA, you should review the following notes and supported ECS Server scenarios before proceeding.



Note:

- Longhorn replication defaults to two replicas. This can be set only during the installation time. Three or more replicas potentially have performance issues.
- Kubectl delete node <host> permanently removes host from cluster and any data on the host is lost. You must reformat the host before readding to the cluster.
- Single node failure may cause the Control Plane or any other management service to be unavailable. In 1.3.4 or later, it will take several minutes to recover automatically.

ECS Server scenarios

Clusters with only two servers are not supported. This is only for the temporary transition from a single server cluster to a three server cluster.

1. Three or more servers

- Redundancy requirements:
 - One failure requires three or more servers
 - Two failures require five or more servers
 - For more information see, [Fault Tolerance](#)
- To recover, you must scale-up the ECS Server roles. For more information on adding ECS node to a cluster, see the following section.

2. Two servers to one server

- Only after a double failure in a three server cluster
- To recover:
 - Stop the ECS service
 - Remove both the failed ECS server roles and hosts from cluster
 - On the surviving server, run the following command `/opt/cloudera/parcels/ECS/bin/rke2 server --cluster-reset`
 - Start the ECS service

3. Single server

- No failure supported

Enable ECS Server HA Post ECS Installation

If you want to enable ECS Server for High Availability after installing ECS, then you must proceed with this section. If you do not want to enable ECS HA, you can safely ignore this section.

As a prerequisite, during the installation, you must have installed ECS with 1 master (with app_domain as Load Balancer URL) + agents. When you are adding more masters, ensure that you add Docker server as well.

Install iptables on the new ECS master nodes

You must install iptables on all of the additional ECS master nodes.

If your ECS hosts are running the CentOS 8.4, OEL 8.4, or RHEL 8 operating systems, you must install iptables on all the ECS hosts. Run the following command on each additional ECS master node:

```
yum --setopt=tsflags=noscripts install -y iptables
```

Adding hosts to the containerized cluster

You must add hosts to the containerized cluster.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Click the Actions drop-down.
4. Click the Add Hosts button. The Add Hosts page appears.
5. Select the Add hosts to cluster option.
6. Select the cluster where you want to add the host from the drop-down list. Click Continue.
7. In the Specify Hosts page, provide a list of available hosts or you can add new hosts. You can provide the Fully Qualified Domain Name (FQDN) in the following patterns: You can specify multiple addresses and address ranges by separating them by commas, semicolons, tabs, or blank spaces, or by placing them on separate lines. Use this technique to make more specific searches instead of searching overly wide ranges.

For example, use host[1-3].network.com to specify these hosts: host1.network.com, host2.network.com, host3.network.com.

Click Continue.

8. In the Select Repository page, you must specify the repository location. Choose any one of the following:
 - a. Cloudera Repository (Requires direct internet access on all hosts)
 - b. Custom Repository
9. In the Select JDK page, select any one from the below options:
 - a. Manually manage JDK
 - b. Install a Cloudera-provided version of OpenJDK
 - c. Install a system-provided version of OpenJDK
10. In the Enter Login Credentials page select the SSH Username and provide the password.
11. The Install Agents page appears. Click Continue.
12. In the Install Parcels page, the selected parcels are downloaded and installed on the host cluster. Click Continue.
13. In the Inspect Hosts page, you can inspect your hosts. If the inspect tool displays any issues, you can fix those issues and run the inspect tool again. Click Continue.
14. In the Select Host Template page, select the hosts.
15. The Deploy Client Config page appears. Click Finish.

Adding Role Instances to Docker Server

You must add role instances to the docker server.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.

3. Open Docker Server.
4. Click the Actions drop-down.
5. Click the Add Role Instances button.
6. Select the hosts.
7. Click OK.

Adding Role Instances to Containerised Cluster

You must add the role instances to the containerised cluster.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Click the Actions drop-down.
4. Click the Add Role Instances button. The Add Role Instances page appears.
5. In the Assign Roles page, specify the role assignments for your new roles. Click Continue.
6. In the Review Changes page, click Finish.

Starting Docker Server on Nodes

You must start the Docker server on nodes.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Open Docker Server.
4. Click the Actions for Selected drop-down.
5. Click Start. Docker Server starts.

Starting ECS Server on Nodes

You must start the ECS server on nodes.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Click the Instances tab.
4. Select the nodes by clicking the checkbox
5. Click the Actions for Selected drop-down.
6. Click Start. ECS Server starts.

Refreshing ECS

You must refresh the ECS servers.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Click the Actions drop-down.
4. Click the Refresh button.

Checking Nodes and Pods in the UI

You must check the nodes and pods in the UI.

1. Log in to Cloudera Manager.
2. Navigate to the ECS service.
3. Click the Web UI drop-down.
4. Click ECS Web UI. The Kubernetes web UI page opens in a new tab.
5. Check the Nodes and Pods on the Web UI.

Enable ECS Server HA and promote agents Post ECS Installation

If you want to enable ECS Server for High Availability after installing ECS, then you must proceed with this section. If you do not want to enable ECS HA, you can safely ignore this section.

As a prerequisite, during the installation, you must have installed ECS with 1 master (with app_domain as Load Balancer URL) + agents. This allows you to promote Agents as masters.

Enabling ECS Server deployment for High Availability

You can enable ECS Server deployment for High Availability by installing a Load Balancer and promoting the existing ECS Agents to ECS Server. By performing this procedure, you will be able to deploy HA on your existing ECS Server. You must have an ECS cluster installed and configured with a single ECS Server.

If you have a production quality ECS cluster, Cloudera recommends that you configure ECS Server High Availability. You can also consider having an ECS Server HA for any non-production ECS cluster that you expect to be available long-term.

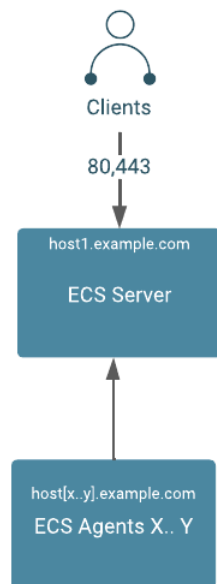
Enabling ECS Server deployment for High Availability involves preparing your cluster, configuring a DNS wildcard entry, adding a Load Balancer into the topology, and promoting ECS Agents to the ECS Server. An ECS High Availability cluster must consist of:

- An odd number of server nodes that will run etcd, the Kubernetes API, and other control plane services. Cloudera recommends a minimum of three ECS Server nodes.
- Two or more agent nodes that are designated to run CDP data services.
- A software or hardware Load balancer using TCP mode (non-terminating https).

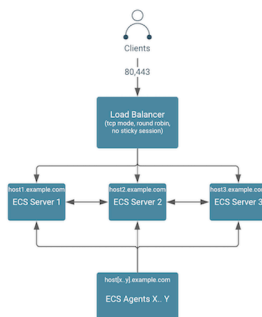


Note: A Load Balancer is required for the ECS Server HA. This documentation uses HAProxy as an example. However, Cloudera recommends that you use your production quality Load Balancer technology from commercial vendors.

Architecture of CDP Private Cloud Data Services on a single ECS Server:



Architecture of CDP Private Cloud Data Services with High Availability:



Preparing the cluster for High Availability:

Review the table to understand the requirements for enabling the High Availability.

1. This process has been tested with a minimum of five ECS hosts. However, Cloudera recommends six or more hosts.
2. DNS requirements for ECS High Availability must be fulfilled.

Hostname	Subdomain	Expected Roles	DNS ForwardZone	Reverse Zone PTR
“Wildcard” (hostname = *)	apps.ecs.example.com The string “apps” is required, “ecs” is up to user	Virtual app domain wildcard	“A Record” wildcard (hostname = *), may be a CNAME on certain DNS systems that use text-based config. Resolves to fixed IP of ha_proxy (or VIP of some commercial LB’s)	N
“apps alias”	apps.ecs.example.com	Virtual app domain alias	“CNAME” alias points to A Record of ha_proxy (or VIP). Alternatively, this can be an ARecord with IP of ha_proxy (or VIP)	N/A
HAProxy (or commercial LB)	<domain of your LB>	HA Load Balancer	Depends on vendor/software	
ecs-master1	example.com	ECS Server 1 Docker server	“A Record” resolves to IP of ecs-master1	Y
ecs-master2	example.com	ECS Server 2 Docker server	“A Record” resolves to IP of ecs-master2	Y
ecs-master3	example.com	ECS Server 3 Docker server	“A Record” resolves to IP of ecs-master3	Y
ecs-agentN	example.com	ECS Agent N Docker server N	“A Record” resolves to IP of ecs-agentN	Y



Note:

1. The above table uses a consistent subdomain (“example.com”) but this is not mandatory. To support multiple domains, you must follow certain steps to ensure that the domains are forward and reverse resolvable using DNS, from all Base cluster and ECS cluster hosts (that is through forest/domain level trusts and/or hosts level /etc/resolv.conf config). You must avoid the use of /etc/hosts entries.
2. A predefined wildcard DNS record allows the resolution of *.apps.<app domain name> to the IP address of the Load Balancer. You cannot proceed further until this is in place.

High Level steps to enable an ECS High Availability cluster

Review the high level steps to understand the steps in enabling High Availability.

Enabling ECS High Availability Cluster

- 1 [Verifying DNS Setup](#)
- 2 [Installing Load Balancer](#)
- 3 [Promoting ECS Agents to ECS Servers](#)
- 4 [Refreshing ECS Cluster](#)



Note:

1. You must have installed an ECS with one ECS server and other nodes that are ECS Agents.
2. You must have a DNS wildcard record that has an IP address pointing to your Load Balancer (hostname or VIP). For more information, see the [KB article](#).

Verifying DNS setup

You must verify the DNS setup to ensure that the app domain DNS hostname points to the Load Balancer.

Procedure

1. Verify that the app domain DNS hostname has moved from single non-HA ECS Server to the Load Balancer.

Hostname	Expected Roles	DNS
ecs-loadbalancer.example.com	Load Balancer	Resolves to IP of LB host (or VIP). The example uses 10.10.0.99. Both *.apps.ecs.example.com and apps.ecs.example.com resolve to 10.10.0.99.

2. Verify the DNS setup with nslookup.



Note: You must verify that a random hostname resolves in the wildcard entry. In this example, Cloudera uses foobar.apps.ecs.example.com as the random name. Both entries should resolve to the same IP address.

For example,

```
$ hosts="apps.ecs.example.com foobar.apps.ecs.example.com"
$ for target in $hosts; do nslookup $target; done

Server: 10.10.xx.xx
Address: 10.10.xx.xx#53

apps.ecs.example.com canonical name = ecs-loadbalancer.example.com.
Name: ecs-loadbalancer.example.com
```

```
Address: 10.10.0.99

Server: 10.10.xx.xx
Address: 10.10.xx.xx#53

Name: foobar.apps.ecs.example.com
Address: 10.10.0.99
```

Results

DNS setup is verified.

What to do next

You must now install the Load Balancer.

Installing Load Balancer

To install the HAProxy Load Balancer, Cloudera uses an example that uses a single instance of HAProxy, configured with round robin balancing and TCP mode. This allows for non-terminating https (https passthrough). The HAProxy service can be configured for High Availability using keepalived.

Before you begin

You must consult your operating system vendor's documentation for requirements and the install guide for configuring HAProxy with keepalived.

To install a HAProxy Load Balancer, you must ssh into the HAProxy host, install, and then configure HAProxy:

Procedure

1. `sudo su -`
2. `yum install haproxy -y`
3. `cp /etc/haproxy/haproxy.cfg /etc/haproxy/haproxy.cfg.bak`
4. `cat > /etc/haproxy/haproxy.cfg << EOF`

```
global
```

log	127.0.0.1 local2
chroot	/var/lib/haproxy
pidfile	/var/run/haproxy.pid
user	haproxy
group	haproxy
daemon	

```
defaults
```

mode	tcp
log	global
option	tcplog
option	dontlognull
option	redispatch
retries	3
maxconn	5000

timeout connect	5s
timeout client	50s
timeout server	50s

listen stats

bind *:8081
mode http
stats enable
stats refresh 30s
stats uri /stats
monitor-uri /healthz

frontend fe_k8s_80

bind *:80
default_backend be_k8s_80

backend be_k8s_80

balance roundrobin
mode tcp
server ecs-server1.example.com 10.10.0.1:80 check
server ecs-server2.example.com 10.10.0.2:80 check
server ecs-server3.example.com 10.10.0.3:80 check

frontend fe_k8s_443

bind *:443
default_backend be_k8s_443

backend be_k8s_443

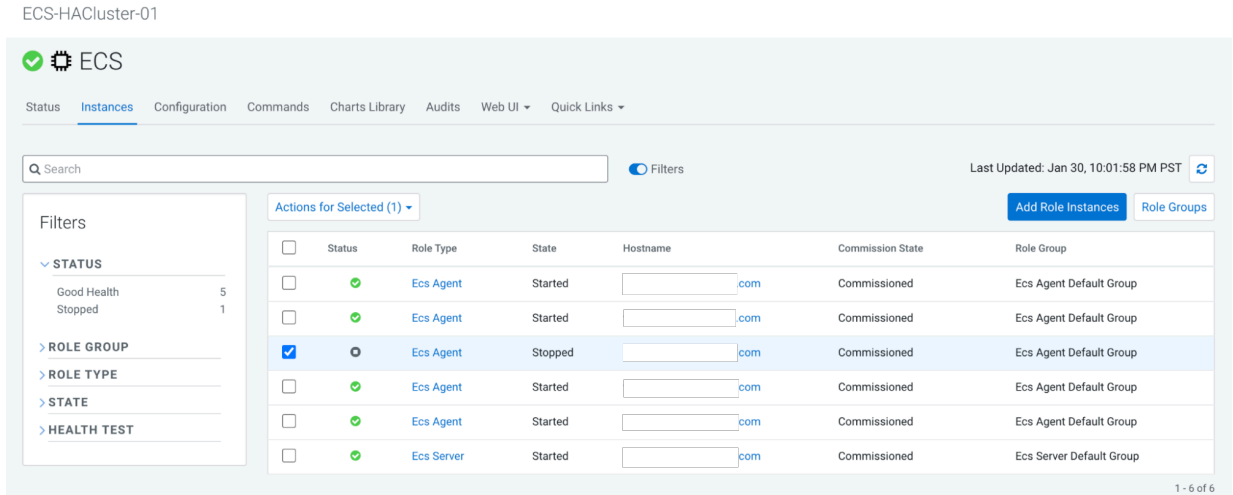
balance roundrobin
mode tcp
server ecs-server1.example.com 10.10.0.1:443 check
server ecs-server2.example.com 10.10.0.2:443 check
server ecs-server3.example.com 10.10.0.3:443 check

EOF

systemctl enable haproxy
systemctl restart haproxy
systemctl status haproxy

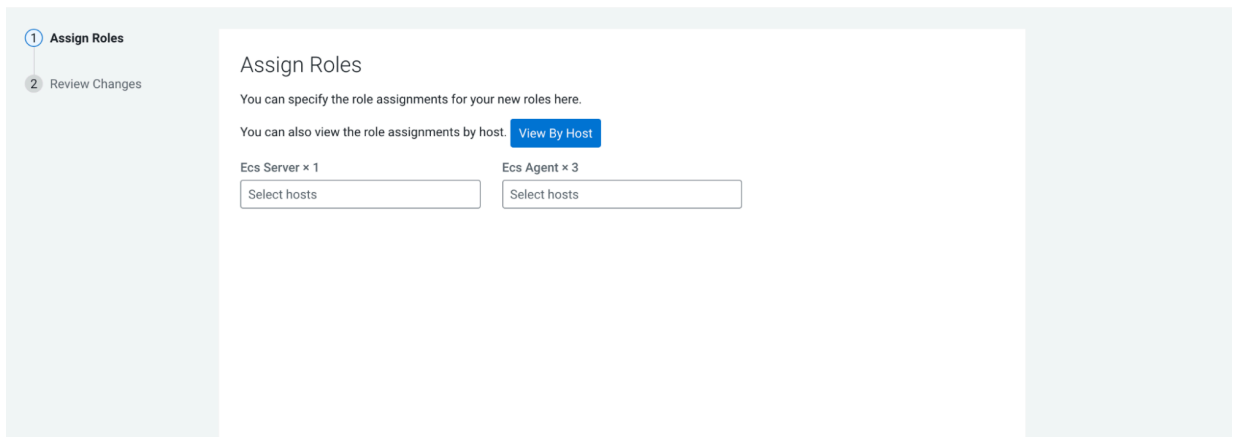
Procedure

1. In Cloudera Manager, select the ECS cluster, then click ECS. Stop the ECS agent running on agent1 and then delete the agent.



2. In ECS, click Add Role Instances.

Add Role Instances to ECS



3. Add the available host agent1 as an ECS server in the Add Role Instances to ECS pop-up. Click OK.

3 Hosts Selected

Select hosts for a new or existing role. The host list is filtered to remove hosts that are not valid candidates; these include hosts that are unhealthy, members of other clusters, or have an incompatible version of the software installed on them.

Enter hostnames: host01, IP addresses or rack

<input type="checkbox"/>	Hostname	IP Address	Rack	Cores	Physical Memory	Existing Roles	Added Roles
<input checked="" type="checkbox"/>	clev-ws1.sme-clev.athens.cloudera.com	10.113.207.11	/default	16	62.8 GIB	DS, ES	ES
<input checked="" type="checkbox"/>	[redacted].com	10.113.207.12	/default	16	62.8 GIB	DS	ES
<input checked="" type="checkbox"/>	[redacted].com	10.113.207.13	/default	16	62.8 GIB	DS	ES
<input type="checkbox"/>	[redacted].com	10.113.207.14	/default	16	62.8 GIB	DS, EA	
<input type="checkbox"/>	[redacted].com	10.113.207.18	/default	16	62.8 GIB	DS, EA	
<input type="checkbox"/>	[redacted].com	10.113.207.19	/default	16	62.8 GIB	DS, EA	

Cancel OK

Add Role Instances to ECS

1 Assign Roles

2 Review Changes

Assign Roles

You can specify the role assignments for your new roles here.

You can also view the role assignments by host: [View By Host](#)

Ecs Server x (1 + 2 New)

Ecs Agent x 3

Select hosts

4. Click Continue.

Experiences Cluster 1

ECS Actions

Status **Instances** Configuration Commands Charts Library Web UI Quick Links

Search Filters Last Updated: Jan 6, 3:58:16 AM UTC

Filters

- STATUS
 - Good Health 4
 - Stopped 2
- ROLE GROUP
- ROLE TYPE
- STATE
- HEALTH TEST

Actions for Selected

<input type="checkbox"/>	Status	Role Type	State	Hostname	Commission State	Role Group
<input type="checkbox"/>	Good Health	Ecs Agent	Started	[redacted].com	Commissioned	Ecs Agent Default Group
<input type="checkbox"/>	Good Health	Ecs Agent	Started	[redacted].com	Commissioned	Ecs Agent Default Group
<input type="checkbox"/>	Good Health	Ecs Agent	Started	[redacted].com	Commissioned	Ecs Agent Default Group
<input type="checkbox"/>	Stopped	Ecs Server	Stopped	[redacted].com	Commissioned	Ecs Server Default Group
<input type="checkbox"/>	Stopped	Ecs Server	Stopped	[redacted].com	Commissioned	Ecs Server Default Group
<input type="checkbox"/>	Good Health	Ecs Server	Started	[redacted].com	Commissioned	Ecs Server Default Group

1 - 6 of 6

5. Start the new ECS server from the ECS Instances view. For example, start the ECS server on agent1.

6. Confirm the node's status from the Web UI or the command line by running the following command:

```
sudo /var/lib/rancher/rke2/bin/kubectl --kubeconfig=/etc/rancher/rke2/rke2.yaml get nodes
```



Note: Do not proceed until the node status is Ready. This may take several minutes.

Name	Labels	Ready	CPU requests (cores)	CPU limits (cores)	Memory requests (bytes)	Memory limits (bytes)	Pods	Created
agent1.com	beta.kubernetes.io/arch: amd64 beta.kubernetes.io/os: linux ecs_role: master	True	4.54 (28.38%)	0.00m (0.00%)	0.00 (0.00%)	0.00 (0.00%)	12 (10.91%)	48 seconds ago

What to do next

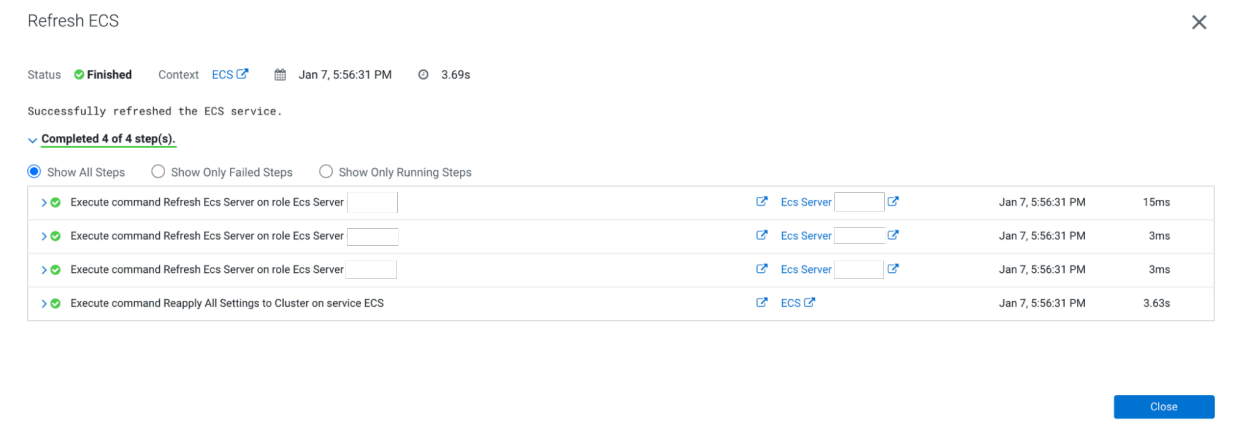
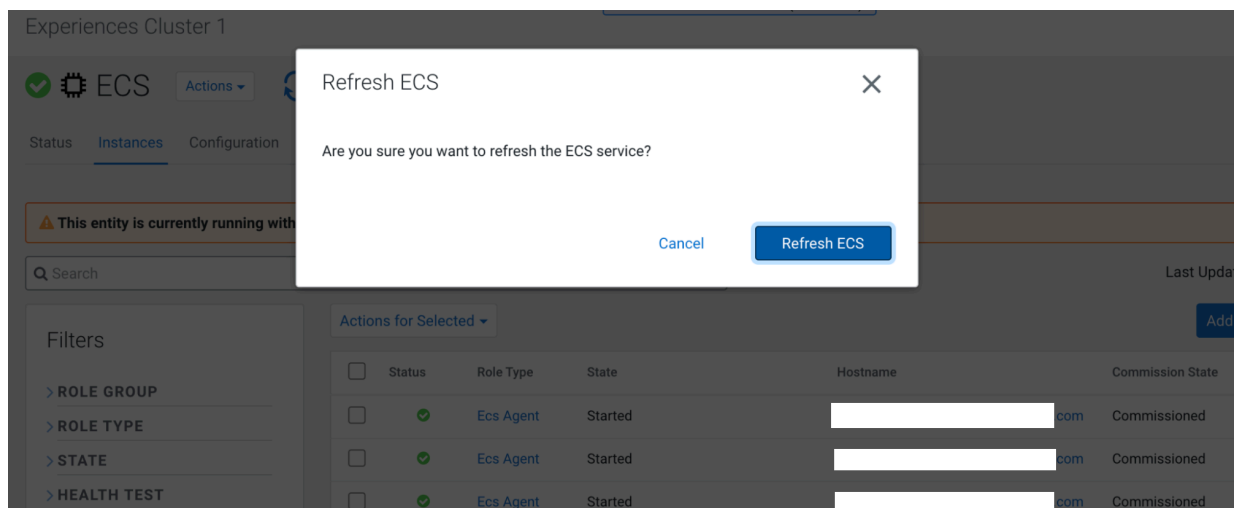
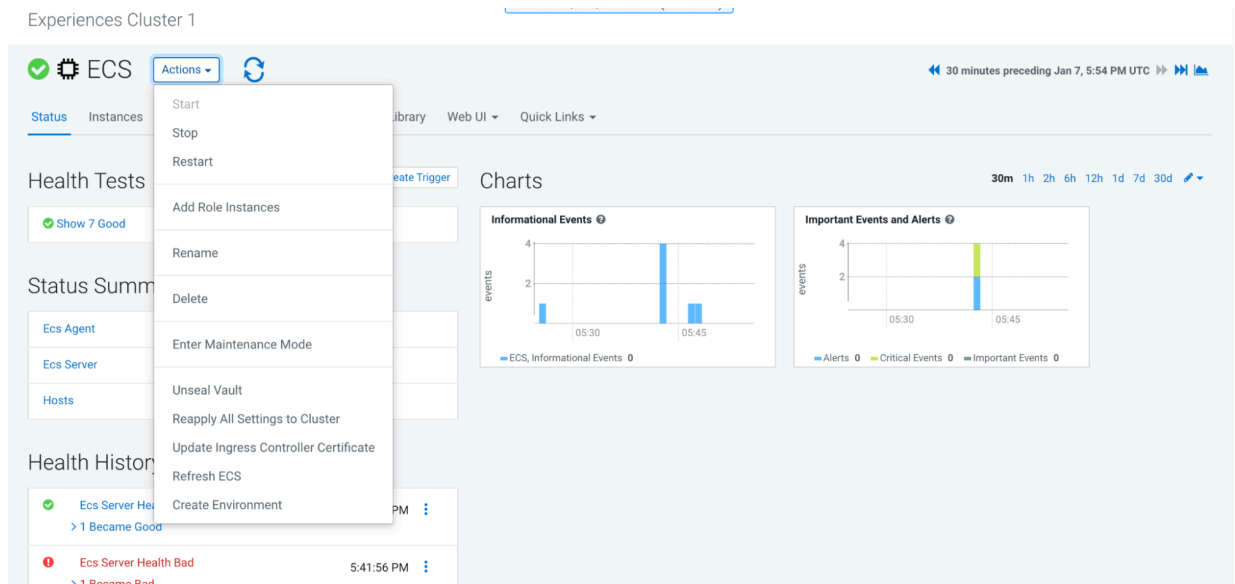
When agent1 is ready, you can promote agent2. To promote agent2, perform steps 1-8 again using agent2.example.com.

Refreshing ECS

After all the ECS Agents are promoted to ECS Servers, you must log in to Cloudera Manager and refresh the ECS cluster.

Procedure

1. Navigate to ECS Cluster >> ECS view >> Actions >> Refresh ECS. This sets the ingress proxy so that all three servers are eligible to process incoming commands.



4. Confirm that there are no alerts in the ECS service.

ECS1

The screenshot displays the ECS service dashboard. At the top, there is a green checkmark icon, a gear icon, and the text 'ECS' next to an 'Actions' dropdown menu. Below this is a navigation bar with tabs for 'Status' (underlined), 'Instances', 'Configuration', 'Commands' (with a play button and '1'), and 'Charts Library'. The main content area is titled 'Health Tests' and includes a 'Create Trigger' button. A summary box shows a green checkmark and the text 'Show 7 Good'. Below this is a 'Status Summary' section with a table:

Ecs Agent	✔ 1 Good Health
Ecs Server	✔ 3 Good Health
Hosts	✔ 4 Good Health

Results

High Availability is now deployed on your ECS cluster.

Manually uninstalling ECS from a cluster

You can manually uninstall ECS from your cluster.

Before you begin

Before performing this procedure, ensure that you have activated the ECS parcel on the cluster hosts.

During the installation time of ECS, the directory for Longhorn and the LSO are decided by Cloudera Manager and defaults to /ecs.

Data Storage Directory defaultDataPath Edit Individual Values defaultDataPath	DOCKER (Service-Wide) ⓘ <input type="text" value="/docker"/>
	ECS (Service-Wide) ⓘ <input type="text" value="/ecs/longhorn-storage"/>
Application Domain app_domain app_domain	ECS (Service-Wide) ⓘ <input type="text" value="cloudera.com"/>
Local Path Storage Directory IsoDataPath IsoDataPath	ECS (Service-Wide) ⓘ <input type="text" value="/ecs/local-storage"/>

Procedure

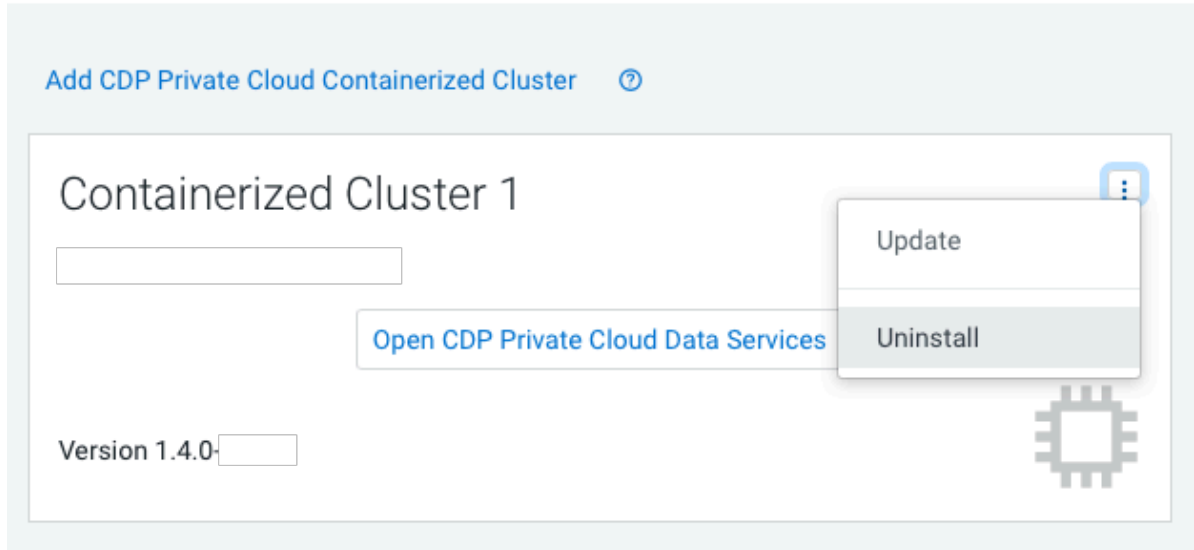
1. On each host in the cluster:
 - a) `/opt/cloudera/parcels/ECS/docker/docker container stop registry`
 - b) `/opt/cloudera/parcels/ECS/docker/docker container rm -v registry`
 - c) `/opt/cloudera/parcels/ECS/docker/docker image rm registry:2`
2. Stop the ECS cluster in Cloudera Manager
3. On each host:
 - a) `cd /opt/cloudera/parcels/ECS/bin`
 - b) `./rke2-killall.sh` # usually 2 times is sufficient
 - c) Use `umount` to unmount all NFS disks.
 - d) `./rke2-uninstall.sh`
 - e) `rm -rf /ecs/*` # assumes the default defaultDataPath and IsoDataPath
 - f) `rm -rf /var/lib/docker_server/*` # deletes the auth and certs
 - g) `rm -rf /etc/docker/certs.d/*` # delete the ca.crt
 - h) `rm -rf /docker` # assumes the default defaultDataPath for docker
 - i) `rm -rf /var/lib/rancher/*`

4. Delete the ECS cluster in Cloudera Manager.

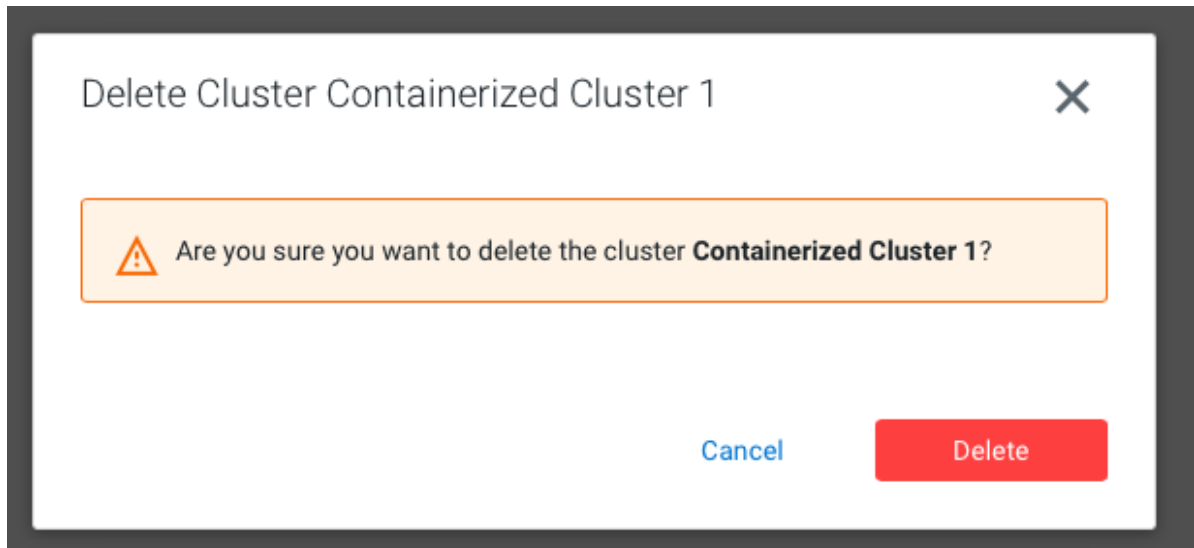
a)

In Cloudera Manager, navigate to CDP Private Cloud Data Services and click . Click Uninstall.

CDP Private Cloud Data Services



b) The Delete Cluster wizard appears. Click Delete.



5. Clean IPTables on each host:

```
echo "Reset iptables to ACCEPT all, then flush and delete all other chains";
declare -A chains=( [filter]=INPUT:FORWARD:OUTPUT
[raw]=PREROUTING:OUTPUT [mangle]=PREROUTING:INPUT:FORWARD:OUTPUT:POSTROUTING
[security]=INPUT:FORWARD:OUTPUT [nat]=PREROUTING:INPUT:OUTPUT:POSTROUTING );
for table in "${!chains[@]}"; do
echo "${chains[$table]}" | tr : $"\n" | while IFS=
read -r;
do sudo iptables -t "$table" -P "$REPLY" ACCEPT
done
```

```
sudo iptables -t "$table" -F
sudo iptables -t "$table" -X
done
```



Note: Alternatively, an experimental script is available. This script combines steps three through five. The script is available here: <https://github.com/cloudera-labs/snippets/blob/main/private-cloud/kill-2-rke>
.sh script

6. Reboot the host(s).
7. Before you install ECS again, ensure that the IP tables list is empty by executing the following command: #iptables -s -L