Operational Database powered by Apache Accumulo 1.0.0

Installing OpDB powered by Apache Accumulo

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Contents

Installing Accumulo Parcel 1.0.0 4
Install Operational Database powered by Apache Accumulo 4
Install Operational Database powered by Apache Accumulo CSD file 4
Install CDP 4
Install Operational Database powered by Apache Accumulo parcel 5
Add Accumulo on CDP service 8
Creating trace user in unsecure Operational Database powered by Apache Accumulo deployment 11
Check trace table 12
Provide user permissions 13
Verify your Operational Database powered by Apache Accumulo installation 14

Installing Accumulo Parcel 1.1.0 16
Install Operational Database powered by Apache Accumulo 16
Install Operational Database powered by Apache Accumulo CSD file 16
Install CDP 17
Install Operational Database powered by Apache Accumulo parcel 17
Add Accumulo on CDP service 20
Verify your Operational Database powered by Apache Accumulo installation 23

Installing Accumulo Parcel 1.10 25
Install Accumulo 25
Install Accumulo CSD file 25
Install CDP 25
Install Accumulo 1.10 parcel 26
Add Accumulo on CDP service 29
Creating a trace user in unsecure Accumulo deployment 32
Check trace table 33
Provide user permissions 34
Verify your Accumulo installation 35

Installing Accumulo Parcel 1.0.0

Learn how to install the Operational Database powered by Apache Accumulo (Accumulo-on-cdp 1.0.0 parcel) on your Cloudera Private Cloud Base environment.

Install Operational Database powered by Apache Accumulo

Before installing Operational Database powered by Apache Accumulo (OpDB), you first have to install Cloudera Manager, CDP cluster services, then install the OpDB CSD and the OpDB Parcel. Ensure you verify your installation by running certain basic commands.

Install Operational Database powered by Apache Accumulo CSD file

As Operational Database powered by Apache Accumulo (OpDB) is an add-on service, you have to install its Custom Services Descriptor (CSD) file to manage the Accumulo on CDP service.

About this task

A Custom Services Descriptor (CSD) file contains all the configuration needed to describe and manage a new service. A CSD is provided in the form of a JAR file. For more information about CSD files, see the *Custom Service Descriptor Files* section in the *Add-on Services* documentation.

Before you begin

Install Cloudera Manager.

Procedure

1. Download the ACCUMULO_CDP-1.0.0 jar file for the CSD that provides the Accumulo on CDP service.

   You can download that JAR file from:

   ```
   archive.cloudera.com/p/accumulo7/1.0.0/csd
   ```

2. Copy the ACCUMULO_CDP-1.0.0.jar file to the location where Cloudera Manager is configured to look for the CSD files. That is by default in the /opt/cloudera/csd folder on the host where Cloudera Manager is running.
3. Restart Cloudera Manager as described in the *Configuring the Location of Customer Service* section in the *Add-on Services* documentation.

What to do next

Install CDP cluster and services.

Related Information

Add-on Services

Install CDP

Before you install the Operational Database powered by Apache Accumulo (OpDB) parcel, you have to install Cloudera Private Cloud Base and add the mandatory services.

The OpDB service is only supported on Cloudera Private Cloud Base. For full cluster installation Cloudera recommends following the CDP Private Cloud Base Installation Guide.

For a FIPS compliant OpDB service you have to follow the FIPS deployment CDP setup steps. For more information, see Installing and Configuring CDP with FIPS.

Ensure you install the following mandatory services for OpDB powered by Apache Accumulo:

- HDFS
- ZooKeeper

Install Operational Database powered by Apache Accumulo parcel

After you have installed the Operational Database powered by Apache Accumulo (OpDB) CSD and the required CDP cluster and services, you have to install the OpDB parcel.

There are two options to install the OpDB parcel:

- Using a Local Parcel Repository
- Using Remote Parcel Repository URLs (archive.cloudera.com)

Install Operational Database powered by Apache Accumulo parcel using Local Parcel Repository

You can install the OpDB powered by Apache Accumulo Parcel (OpDB) using your Local Parcel Repository. For this, you have to download the parcel, copy it to your Local Parcel Repository, and then distribute and activate it using Cloudera Manager.

Before you begin

- Install the OpDB CSD file
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

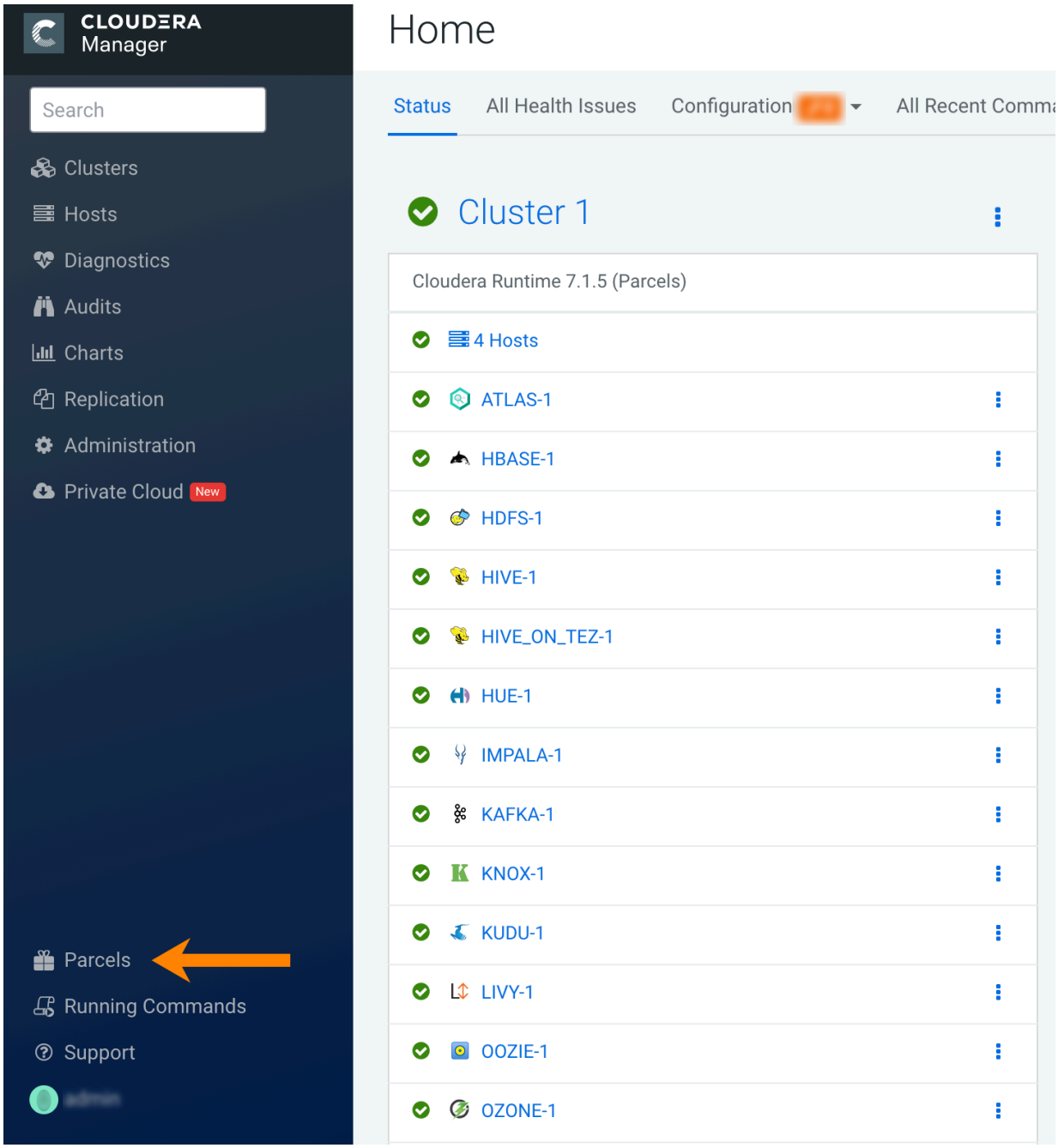
Procedure

1. Download the ACCUMULO_ON_CDP-1.0.0.p0.11738502-el7.parcel OpDB parcel from:

   ```
   archive.cloudera.com/p/accumulo7/1.0.0/parcels
   ```

2. Copy the ACCUMULO_ON_CDP-1.0.0.p0.11738502-el7.parcel file to the Local Parcel Repository. The Local Parcel Repository is by default located in /opt/cloudera/parcel-repo directory on the host where Cloudera Manager is running.

3. In Cloudera Manager, navigate to Parcels.



4. Click Check for New Parcels.
   The ACCUMULO_ON_CDP-1.0.0.p0.11738502-el7.parcel parcel appears in the Parcel list.
5. In the row of ACCUMULO_ON_CDP-1.0.0.p0.11738502-el7.parcel, click Distribute.
6. After the distribution is completed, click Activate.

Results

OpDB parcel is installed.

What to do next

Add the Accumulo on CDP service.

Install Operational Database powered by Apache Accumulo using Remote Parcel Repository

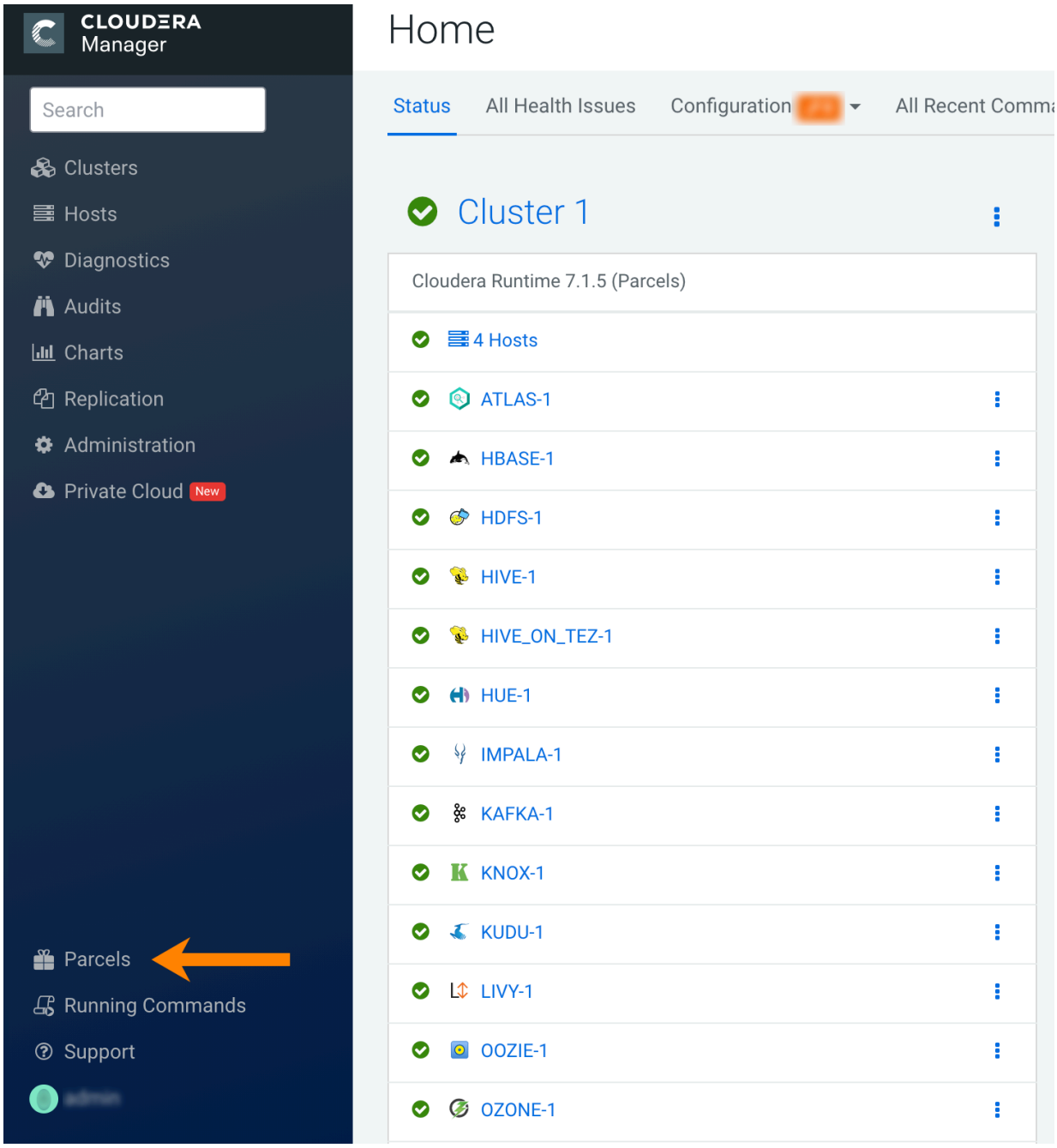
You can install the Operational Database powered by Apache Accumulo (OpDB) parcel using the archive.cloudera.com Remote Parcel Repository.

Before you begin

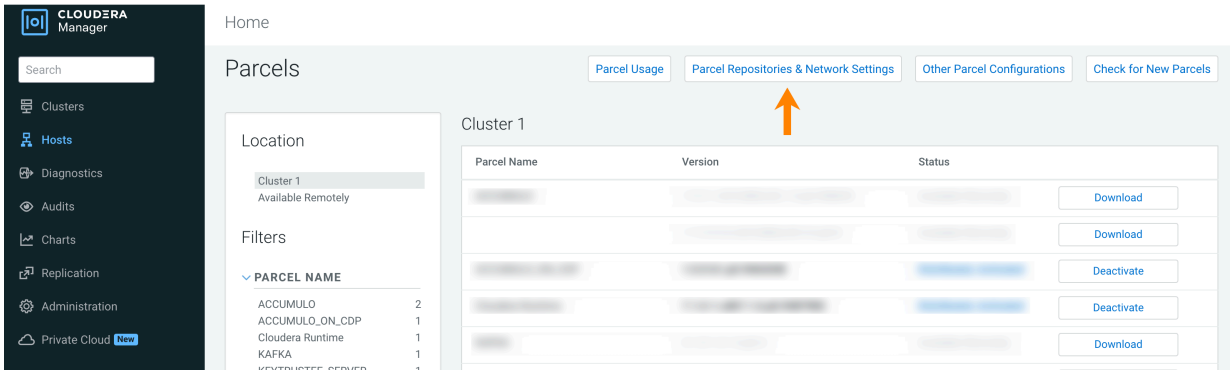
- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

Procedure

1. In Cloudera Manager, navigate to Parcels.



2. Click Parcel Repositories & Network Settings.



3. In the Remote Parcel Repository URLs section, click ⊕ (Add Another) to include another remote parcel repository URL.
4. Add the following URL:

```
https://archive.cloudera.com/p/accumulo7/1.0.0/parcels/
```

5. Click Save & Verify Configuration.
6. In the row of ACCUMULO_ON_CDP 1.0.0.p0.11738502-el7.parcel, click Download.
7. After the download is completed, click Distribute.
8. Once the distribution is completed, click Activate.

What to do next

Add the Accumulo on CDP service.

Add Accumulo on CDP service

After you have installed the Operational Database powered by Apache Accumulo (OpDB) CSD, the required CDP cluster and services, and the OpDB parcel, you can add the Accumulo on CDP service to your cluster.

You can add a secure or an unsecured Accumulo on CDP service to your CDP Private Cloud Base deployment when installing OpDB. A secure Accumulo on CDP service requires a secure cluster, which means an SASL-enabled Kerberized cluster.

The steps to add a secure Accumulo on CDP service are different from the steps to add an unsecure Accumulo on CDP service. If you require a FIPS compliant OpDB service, follow the steps in the Add secure Accumulo on CDP service to your cluster.

Add unsecure Accumulo on CDP service to your cluster

If your cluster is not an SASL enabled Kerberized cluster, add an unsecure Accumulo on CDP service to your cluster when installing Operational Database powered by Apache Accumulo (OpDB).

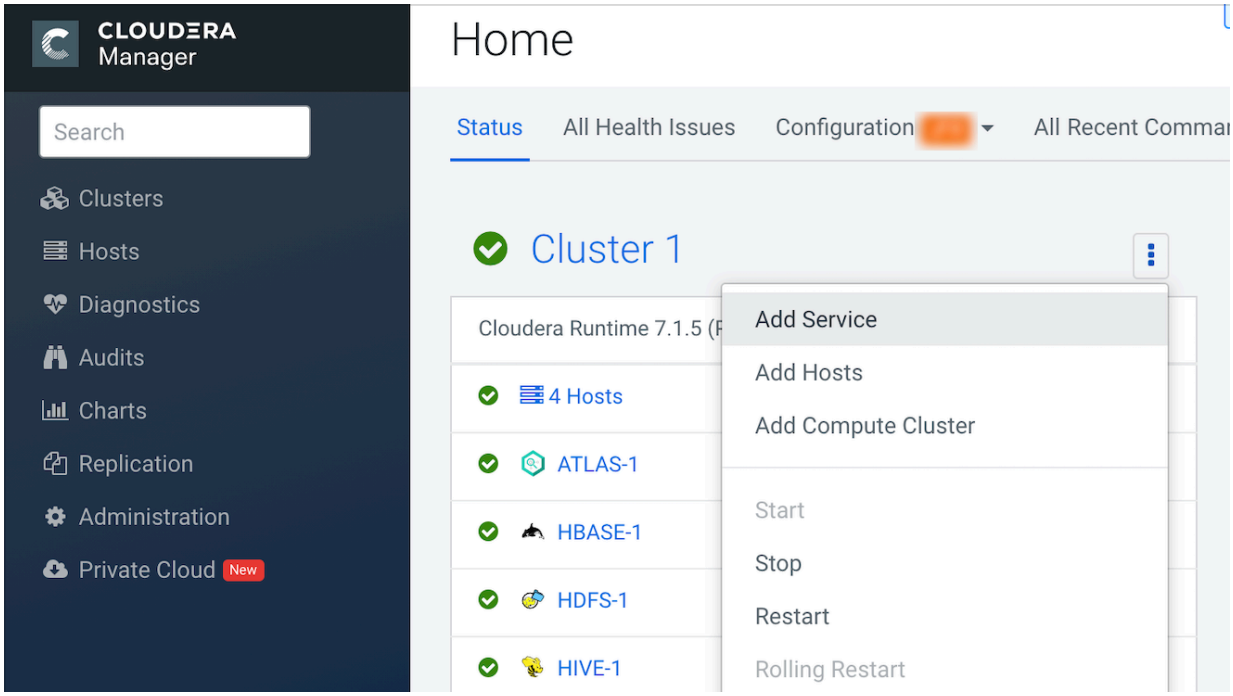
Before you begin

- Install OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.

2. Click the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, Tracer, and Master role to non-DataNodes.
   - Assign the Gateway role to any hosts where you want to use the Accumulo on CDP service, and where you do not already have any other OpDB roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.
9. Set the Trace User and Trace Password settings.

   It is recommended that you not leave the Trace User set to root, because this is not a secure configuration.
10. If this is the first installation of OpDB, ensure that the Initial Accumulo option is selected.
11. Click Continue.
12. Wait while Cloudera Manager does the initial service setup.
13. Click Continue.
14. Click Finish.

Add secure Accumulo on CDP service to your cluster

To ensure data availability to diverse sets of users with varying levels of permissions and security clearance, add a secure Accumulo on CDP service.

About this task

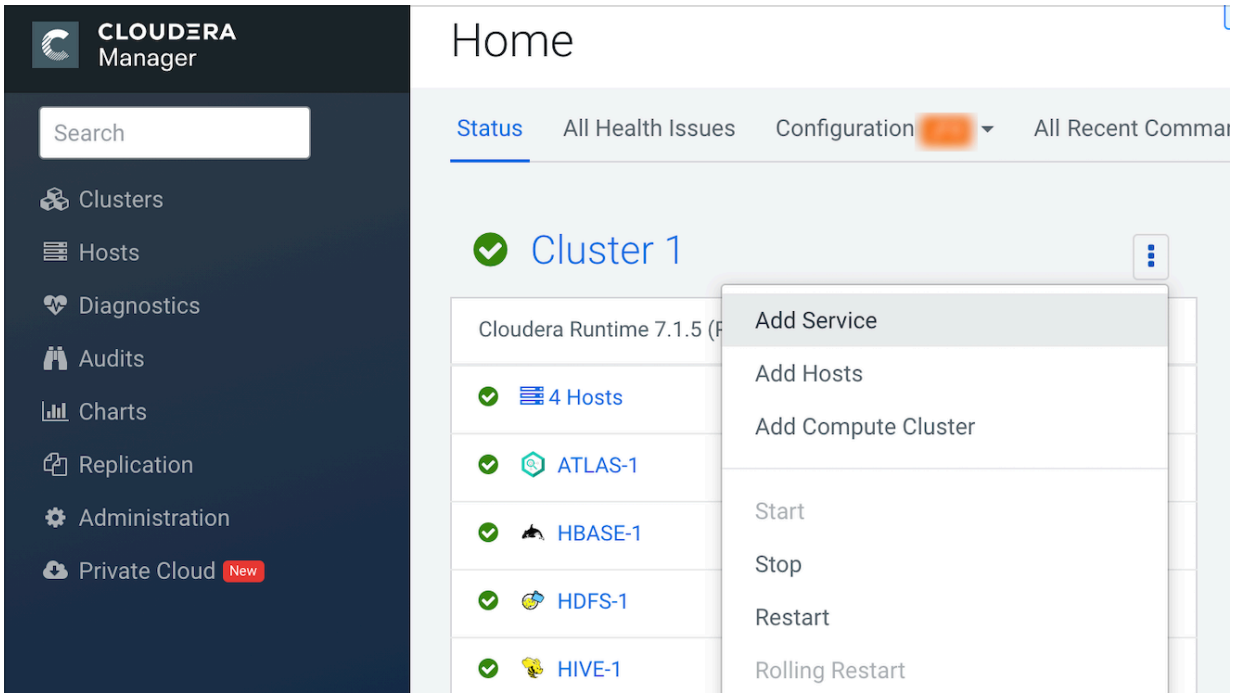
If your secure Accumulo on CDP service needs to be FIPS compliant, ensure that you have followed the FIPS specific deployment setup steps provided in Installing and Configuring CDP with FIPS.

Before you begin

- Install OpDB CSD file.
- Install CDP.
- Add the HDFS and ZooKeeper services to your CDP deployment.
- Install the OpDB parcel.
- Ensure that you have a SASL enabled Kerberized cluster.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.
2. Select the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, Tracer, and Master role to non-DataNodes.
   - Assign the Gateway role to any hosts here you want to use the OpDB service and that do not already have other OpDB roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.

9. Select Enable Kerberos Authentication.

   Note: This setting overwrites the trace user with the default Accumulo Kerberos principal. This is the reason the Tracer Role must be on the same node as the Master.

10. If this is the first installation of OpDB, ensure that the Initial Accumulo option is selected.
11. Click Continue.
12. Wait while Cloudera Manager does the initial service setup.
13. Click Continue.
14. Click Finish.
15. Restart all role except Tracers.
16. Create a client configuration file for the admin user.

    This step needs to be performed on each Gateway machine where you will run an OpDB client.

    Client configuration can be created by editing the configuration file in the following way:

```
auth.principal=accumulo/[***HOSTNAME***]
auth.type=kerberos
auth.token=/var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SER
VICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab
sasl.enabled=true
sasl.qop=auth-conf
```

    By default the Accumulo principal on which master is running becomes the administrator principal. You can set up a different administrative user. For more information, see the Administrative User section of the user manual. In this case you need to change the auth.principal and auth.token configuration properties accordingly.

Creating trace user in unsecure Operational Database powered by Apache Accumulo deployment

After you add an unsecure Accumulo on CDP service, you have to ensure that the trace user exists. This step is only required if you have an unsecure Operational Database powered by Apache Accumulo (OpDB) deployment.

About this task

This step is not required if you have a secure OpDB deployment, because in that case the trace user is automatically created when the Accumulo on CDP service is added to the cluster.

Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.
- Add an unsecure Accumulo on CDP to your deployment.

Ensure that you have added an unsecure OpDB service to your cluster.

Procedure

1. Launch the Accumulo shell for the admin user.

```
$ accumulo shell -u root
Password: ******
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
```

```
-
- type 'help' for a list of available commands
-
root@accumulo>
```

2. List the existing users and check if trace user exists: users

   If the trace user exists, you can continue your OpDB installation.

3. If the trace user does not exist, create it with the following command: createuser trace

What to do next

Ensure that the trace table exists.

Check trace table

After you have added the Accumulo on CDP service as a part of the Operational Database powered by Apache Accumulo (OpDB) installation, you have to check if the trace table, that records the time span of operations, exists.

About this task

OpDB records the time that various operations take when tracing is turned on. It follows all the requests made on behalf of the user throughout the distributed infrastructure of Accumulo, and across all threads of execution.

These timespans are inserted into the trace table in OpDB. You can browse recent traces from the Accumulo monitor page. You can also read the trace table directly like any other table.

Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.
- Add the Accumulo on CDP service to your deployment.

Procedure

1. Launch the Accumulo shell for the admin user.

   - Unsecure OpDB

     ```
     $ accumulo shell -u root
     Password: ******
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     -
     - type 'help' for a list of available commands
     -
     root@accumulo>
     ```

   - Secure OpDB

     ```
     kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
     ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
     HOSTNAME***]
     accumulo shell
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     ```

```
-
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. List tables and check if the trace table exists.

```
> tables
accumulo.metadata
accumulo.replication
accumulo.root
trace
>
```

3. If the trace table does not exist, create it with the following command: createtable trace.

What to do next

Provide user permissions.

Provide user permissions

After the Accumulo on CDP service is added as part of the Operational Database powered by Apache Accumulo (OpDB), you have to provide privileges to the principal in which the Tracer is running.

Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.
- Add the Accumulo on CDP service.
- Check the trace table.

Procedure

1. Launch the Accumulo shell for the admin user.
   - Unsecure OpDB

```
$ accumulo shell -u root
Password: ******
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
- type 'help' for a list of available commands
-
root@accumulo>
```

   - Secure OpDB

```
kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
HOSTNAME***]
accumulo shell
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
```

```
-
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. Add READ, WRITE, and ALTER_TABLE privileges to the principal in which the Tracer is running.
   - Unsecure OpDB

     ```
     grant Table.READ -t trace -u trace
     grant Table.WRITE -t trace -u trace
     grant Table.ALTER_TABLE -t trace -u trace
     ```

   - Secure OpDB

     ```
     'grant Table.READ -t trace -u accumulo/hostname@REALM.COM'
     'grant Table.WRITE -t trace -u accumulo/hostname@REALM.COM'
     'grant Table.ALTER_TABLE -t trace -u accumulo/hostname@REALM.COM'
     ```

   In an unsecure OpDB deployment if you configured the trace user with a _HOST instance component, you must repeat this command with an instance for each host that will run a Tracer or Monitor role.
3. Start all Tracer roles.

What to do next

Verify your OpDB installation.

Verify your Operational Database powered by Apache Accumulo installation

You can verify your Operational Database powered by Apache Accumulo (OpDB) installation using the Accumulo shell.

Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.
- Add the Accumulo on CDP service to your deployment.
- Check trace table.
- Provide user permissions.

Procedure

1. Launch the Accumulo shell for the admin user.
   - Unsecure OpDB

     ```
     $ accumulo shell -u root
     Password: ******
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     -
     - type 'help' for a list of available commands
     -
     root@accumulo>
     ```

- Secure OpDB

```
kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
HOSTNAME***]
accumulo shell
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. Run the following commands to verify your installation:
   a) Create a table: createtable test
   The test table is created and becomes the current table.
   b) List the admin user's permission and ensure it has admin and system level privileges: userpermission
   c) Please note, on a secure cluster the user creating the table does not get access to the new table by default. On a secure cluster these permissions have to be set manually:

```
'grant Table.READ -t test -u accumulo/hostname@REALM.COM'
'grant Table.WRITE -t test -u accumulo/hostname@REALM.COM'
'grant Table.ALTER_TABLE -t test -u accumulo/hostname@REALM.COM'
'grant Table.DROP_TABLE -t test -u accumulo/hostname@REALM.COM'
```

   d) Insert some rows to the test table:

```
insert row f1 q1 v1
insert row f2 q2 v2
insert row f3 q3 v3
```

   e) Scan the table: scan

```
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
```

   f) Delete the test table: root@accumulo test> deletetable
   Table: [test] has been deleted.

Example

The following example shows the verification of an unsecured OpDB installation:

```
root@accumulo> createtable test
root@accumulo test> userpermissions
System permissions: System.GRANT, System.CREATE_TABLE, System.DROP_TABLE, Sy
stem.ALTER_TABLE, System.CREATE_USER, System.DROP_USER, System.ALTER_USER, S
ystem.SYSTEM, System.CREATE_NAMESPACE, System.DROP_NAMESPACE, System.ALTER_N
AMESPACE, System.OBTAIN_DELEGATION_TOKEN

Namespace permissions (accumulo): Namespace.READ, Namespace.ALTER_TABLE

Table permissions (accumulo.metadata): Table.READ, Table.ALTER_TABLE
Table permissions (accumulo.replication): Table.READ
Table permissions (accumulo.root): Table.READ, Table.ALTER_TABLE
Table permissions (test): Table.READ, Table.WRITE, Table.BULK_IMPORT, Tabl
e.ALTER_TABLE, Table.GRANT, Table.DROP_TABLE, Table.GET_SUMMARIES
```

```
Table permissions (trace): Table.READ, Table.WRITE, Table.BULK_IMPORT, Tab
le.ALTER_TABLE, Table.GRANT, Table.DROP_TABLE, Table.GET_SUMMARIES
root@accumulo test> insert row f1 q1 v1
root@accumulo test> insert row f2 q2 v2
root@accumulo test> insert row f3 q3 v3
root@accumulo test> scan
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
root@accumulo test> deletetable
deletetable { test } (yes|no)? yes
Table: [test] has been deleted.
root@accumulo>
```

Installing Accumulo Parcel 1.1.0

Learn how to install the Operational Database powered by Apache Accumulo (Accumulo-on-cdp 1.1.0 parcel) on your Cloudera Private Cloud Base environment.

Install Operational Database powered by Apache Accumulo

Before installing Operational Database powered by Apache Accumulo (OpDB), you first have to install Cloudera Manager, CDP cluster services, then install the OpDB CSD and the OpDB Parcel. Ensure you verify your installation by running certain basic commands.

Install Operational Database powered by Apache Accumulo CSD file

As Operational Database powered by Apache Accumulo (OpDB) is an add-on service, you have to install its Custom Services Descriptor (CSD) file to mananage the Accumulo on CDP service.

About this task

A Custom Services Descriptor (CSD) file contains all the configuration needed to describe and manage a new service. A CSD is provided in the form of a JAR file. For more information about CSD files, see the *Custom Service Descriptor Files* section in the *Add-on Services* documentation.

Before you begin

Install Cloudera Manager.

Procedure

1. Download the ACCUMULO_CDP-1.1.0 jar file for the CSD that provides the Accumulo on CDP service.

   You can download that JAR file from:

   ```
   archive.cloudera.com/p/accumulo7/1.1.0/csd
   ```

2. Copy the ACCUMULO_CDP-1.1.0.jar file to the location where Cloudera Manager is configured to look for the CSD files. That is by default in the /opt/cloudera/csd folder on the host where Cloudera Manager is running.
3. Restart Cloudera Manager as described in the *Configuring the Location of Customer Service* section in the *Add-on Services* documentation.

What to do next

Install CDP cluster and services.

Related Information

Add-on Services

Install CDP

Before you install the Operational Database powered by Apache Accumulo (OpDB) parcel, you have to install Cloudera Private Cloud Base and add the mandatory services.

The OpDB service is only supported on Cloudera Private Cloud Base. For full cluster installation Cloudera recommends following the CDP Private Cloud Base Installation Guide.

For a FIPS compliant OpDB service you have to follow the FIPS deployment CDP setup steps. For more information, see Installing and Configuring CDP with FIPS.

Ensure you install the following mandatory services for OpDB powered by Apache Accumulo:

- HDFS
- ZooKeeper

Install Operational Database powered by Apache Accumulo parcel

After you have installed the Operational Database powered by Apache Accumulo (OpDB) CSD and the required CDP cluster and services, you have to install the OpDB parcel.

There are two options to install the OpDB parcel:

- Using a Local Parcel Repository
- Using Remote Parcel Repository URLs (archive.cloudera.com)

Install Operational Database powered by Apache Accumulo parcel using Local Parcel Repository

You can install the OpDB powered by Apache Accumulo Parcel (OpDB) using your Local Parcel Repository. For this, you have to download the parcel, copy it to your Local Parcel Repository, and then distribute and activate it using Cloudera Manager.

Before you begin

- Install the OpDB CSD file
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

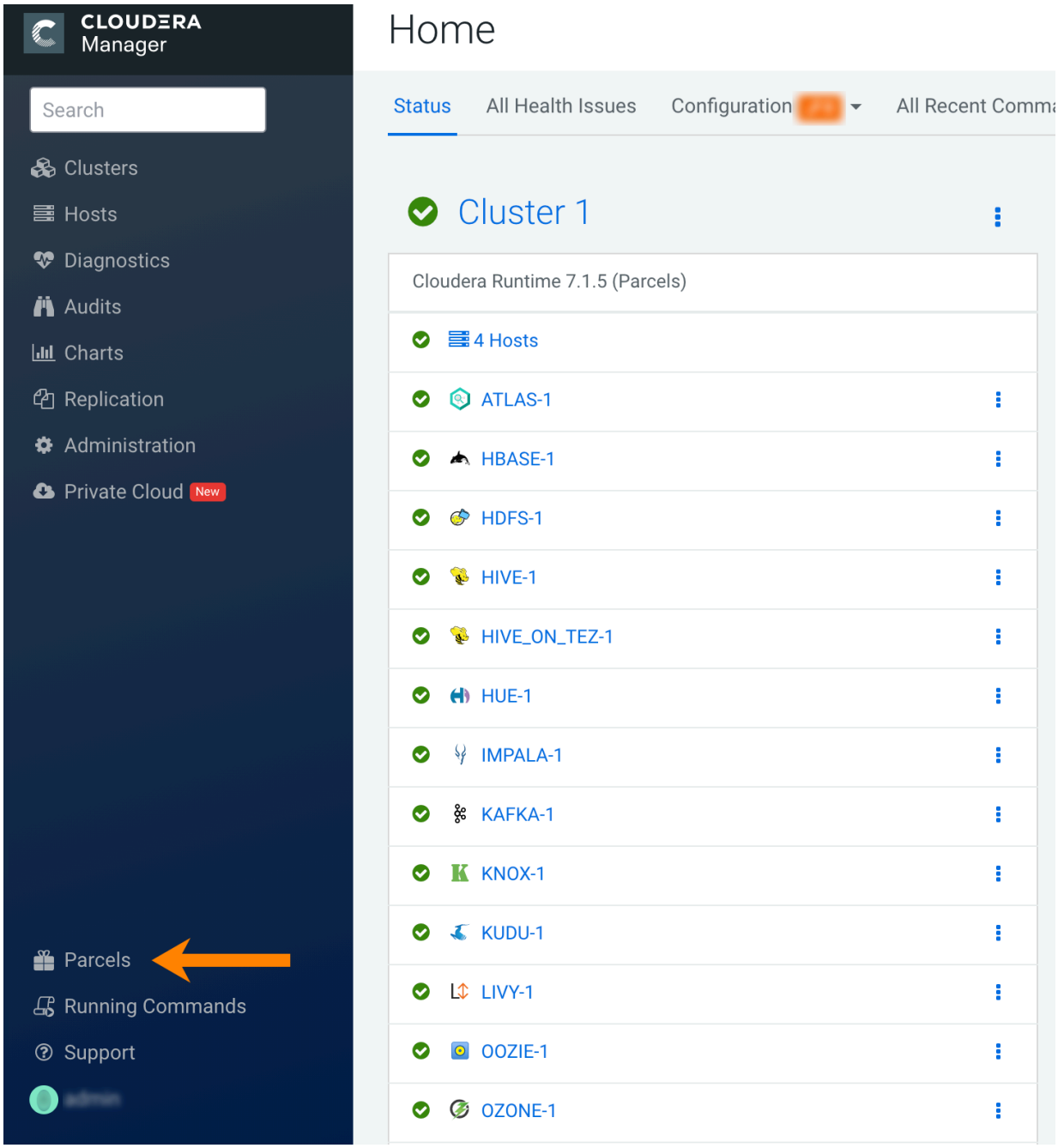
Procedure

1. Download the ACCUMULO_ON_CDP-1.1.0.p0.11738502-el7.parcel OpDB parcel from:

   ```
   archive.cloudera.com/p/accumulo7/1.1.0/parcels
   ```

2. Copy the ACCUMULO_ON_CDP-1.1.0.p0.11738502-el7.parcel file to the Local Parcel Repository. The Local Parcel Repository is by default located in /opt/cloudera/parcel-repo directory on the host where Cloudera Manager is running.

3. In Cloudera Manager, navigate to Parcels.



4. Click Check for New Parcels.
   The ACCUMULO_ON_CDP-1.1.0.p0.11738502-el7.parcel parcel appears in the Parcel list.
5. In the row of ACCUMULO_ON_CDP-1.1.0.p0.11738502-el7.parcel, click Distribute.
6. After the distribution is completed, click Activate.

Results

OpDB parcel is installed.

What to do next

Add the Accumulo on CDP service.

Install Operational Database powered by Apache Accumulo using Remote Parcel Repository

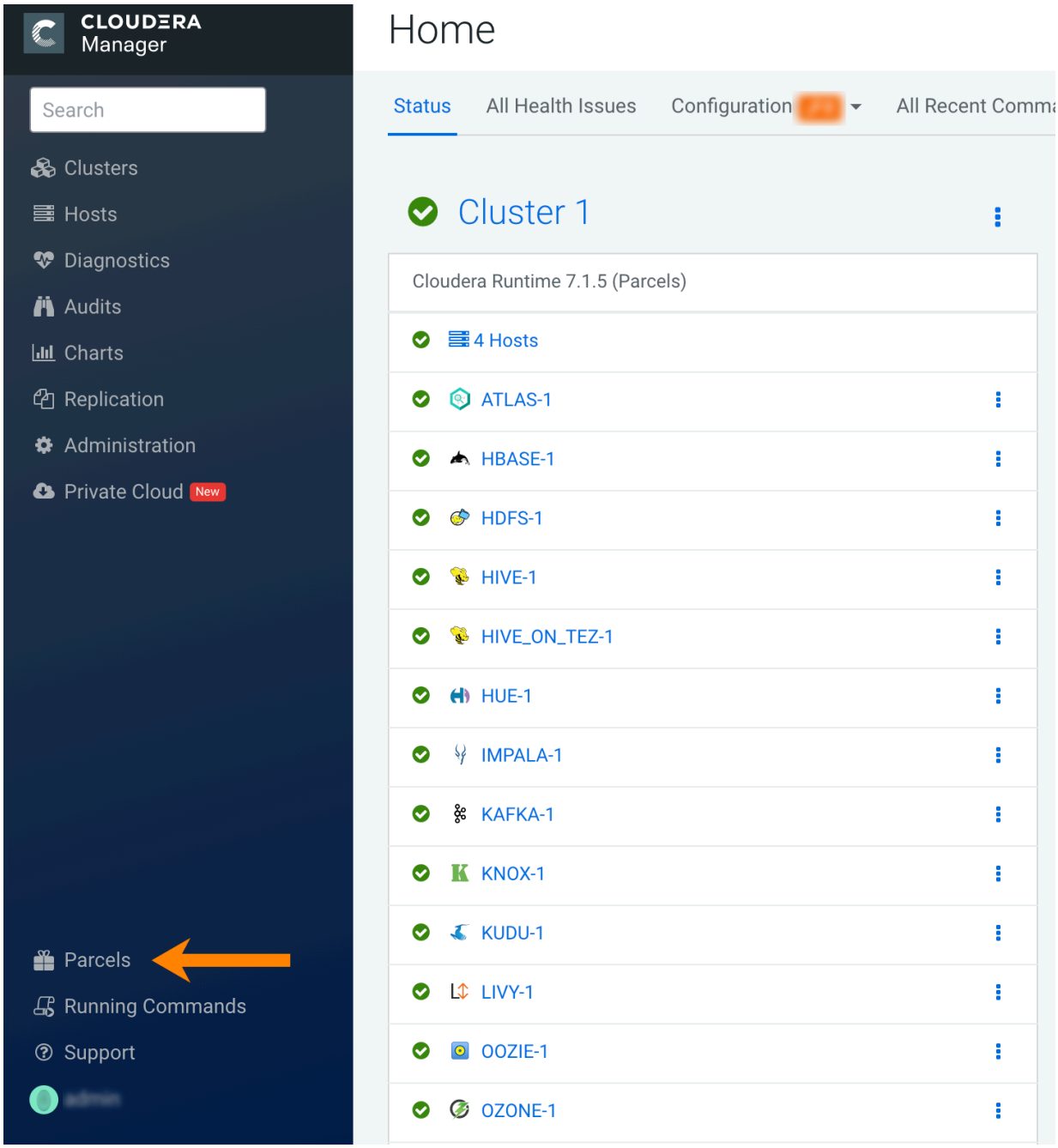
You can install the Operational Database powered by Apache Accumulo (OpDB) parcel using the archive.cloudera.com Remote Parcel Repository.

Before you begin

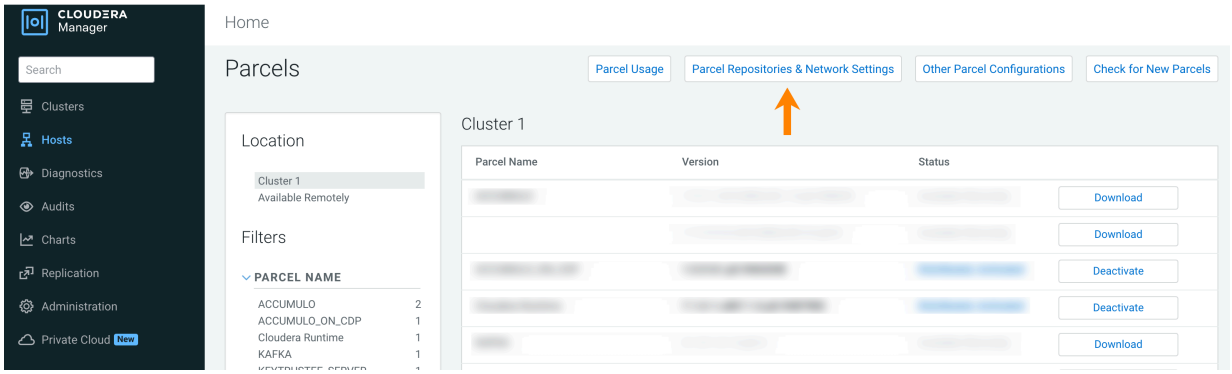
- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

Procedure

1. In Cloudera Manager, navigate to Parcels.



2. Click Parcel Repositories & Network Settings.



3. In the Remote Parcel Repository URLs section, click ⊕ (Add Another) to include another remote parcel repository URL.
4. Add the following URL:

```
https://archive.cloudera.com/p/accumulo7/1.1.0/parcels/
```

5. Click Save & Verify Configuration.
6. In the row of ACCUMULO_ON_CDP 1.1.0.p0.11738502-el7.parcel, click Download.
7. After the download is completed, click Distribute.
8. Once the distribution is completed, click Activate.

What to do next

Add the Accumulo on CDP service.

Add Accumulo on CDP service

After you have installed the Operational Database powered by Apache Accumulo (OpDB) CSD, the required CDP cluster and services, and the OpDB parcel, you can add the Accumulo on CDP service to your cluster.

You can add a secure or an unsecured Accumulo on CDP service to your CDP Private Cloud Base deployment when installing OpDB. A secure Accumulo on CDP service requires a secure cluster, which means an SASL-enabled Kerberized cluster.

The steps to add a secure Accumulo on CDP service are different from the steps to add an unsecure Accumulo on CDP service. If you require a FIPS compliant OpDB service, follow the steps in the Add secure Accumulo on CDP service to your cluster.

Add unsecure Accumulo on CDP service to your cluster

If your cluster is not an SASL-enabled Kerberized cluster, add an unsecure Accumulo on CDP service to your cluster when installing an Operational Database powered by Apache Accumulo (OpDB).

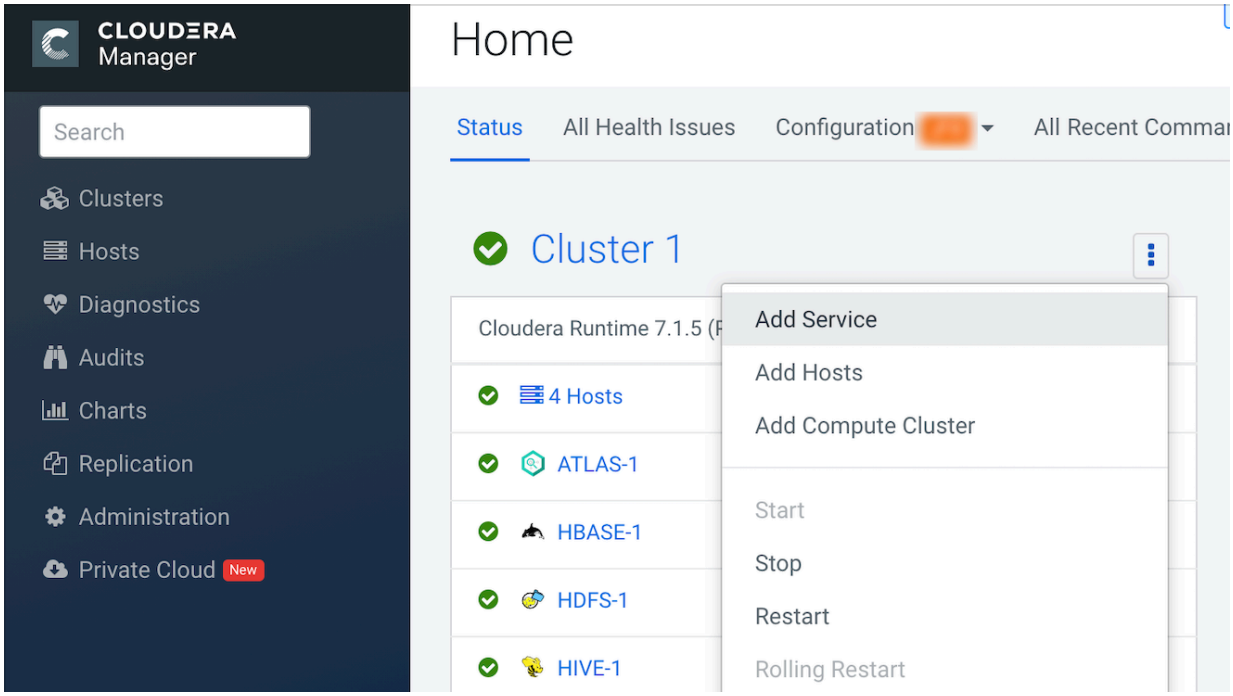
Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.

2. Click the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, and Master role to non-DataNodes.
   - Assign the Gateway role to any hosts where you want to use the Accumulo on CDP service, and where you do not already have any other OpDB roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.
9. If this is the first installation of OpDB, ensure that the Initial Accumulo option is selected.
10. Click Continue.
11. Wait while Cloudera Manager does the initial service setup.
12. Click Continue.
13. Click Finish.

Add secure Accumulo on CDP service to your cluster

To ensure data availability to diverse sets of users with varying levels of permissions and security clearance, add a secure Accumulo on CDP service.

About this task

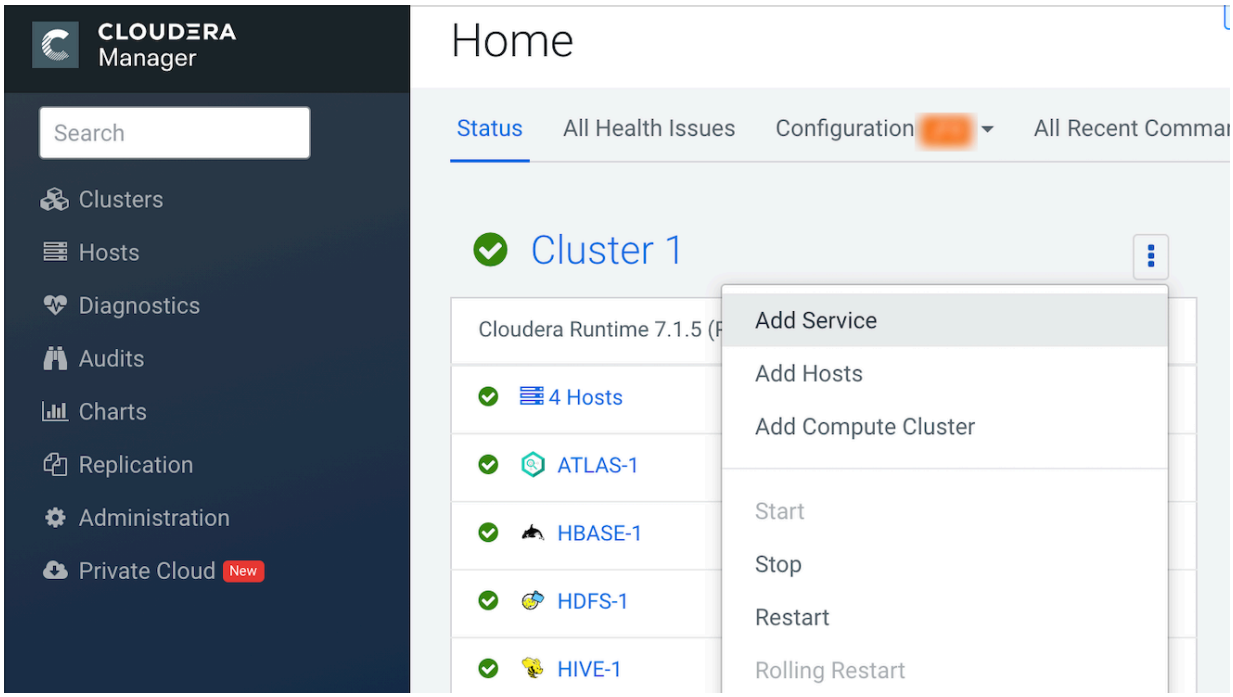
If your secure Accumulo on CDP service needs to be FIPS compliant, ensure that you have followed the FIPS specific deployment setup steps provided in Installing and Configuring CDP with FIPS.

Before you begin

- Install OpDB CSD file.
- Install CDP.
- Add the HDFS and ZooKeeper services to your CDP deployment.
- Install the OpDB parcel.
- Ensure that you have a SASL-enabled Kerberized cluster.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.
2. Select the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, and Master role to non-DataNodes.
   - Assign the Gateway role to any hosts here you want to use the OpDB service and that do not already have other OpDB roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.
9. Select Enable Kerberos Authentication.
10. If this is the first installation of OpDB, ensure that the Initial Accumulo option is selected.
11. Click Continue.
12. Wait while the Cloudera Manager does the initial service setup.

13. Click Continue.
14. Click Finish.
15. Create a client configuration file for the admin user.

    This step needs to be performed on each Gateway machine where you will run an OpDB client.

    Client configuration can be created by editing the configuration file in the following way:

```
auth.principal=accumulo/[***HOSTNAME***]
auth.type=kerberos
auth.token=/var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SER
VICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab
sasl.enabled=true
sasl.qop=auth-conf
```

    By default the Accumulo principal on which master is running becomes the administrator principal. You can set up a different administrative user. For more information, see the Administrative User section of the user manual. In this case, you need to change the auth.principal and auth.token configuration properties accordingly.

Verify your Operational Database powered by Apache Accumulo installation

You can verify your Operational Database powered by Apache Accumulo (OpDB) installation using the Accumulo shell.

Before you begin

- Install the OpDB CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the OpDB parcel.
- Add the Accumulo on CDP service to your deployment.

Procedure

1. Launch the Accumulo shell for the admin user.
   - Unsecure OpDB

```
$ accumulo shell -u root
Password: ******
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
- type 'help' for a list of available commands
-
root@accumulo>
```

   - Secure OpDB

```
kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
HOSTNAME***]
accumulo shell
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
```

```
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. Run the following commands to verify your installation:
   a) Create a table: createtable test
      The test table is created and becomes the current table.
   b) List the admin user's permission and ensure it has admin and system level privileges: userpermission
   c) On a secure cluster, the user who creates the table does not get access to the new table by default. These permissions have to be set manually:

```
'grant Table.READ -t test -u accumulo/hostname@REALM.COM'
'grant Table.WRITE -t test -u accumulo/hostname@REALM.COM'
'grant Table.ALTER_TABLE -t test -u accumulo/hostname@REALM.COM'
'grant Table.DROP_TABLE -t test -u accumulo/hostname@REALM.COM'
```

   d) Insert some rows to the test table:

```
insert row f1 q1 v1
insert row f2 q2 v2
insert row f3 q3 v3
```

   e) Scan the table: scan

```
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
```

   f) Delete the test table: root@accumulo test> deletetable
      Table: [test] has been deleted.

Example

The following example shows the verification of an unsecured OpDB installation:

```
root@accumulo> createtable test
root@accumulo test> userpermissions
System permissions: System.GRANT, System.CREATE_TABLE, System.DROP_TABLE, Sy
stem.ALTER_TABLE, System.CREATE_USER, System.DROP_USER, System.ALTER_USER, S
ystem.SYSTEM, System.CREATE_NAMESPACE, System.DROP_NAMESPACE, System.ALTER_N
AMESPACE, System.OBTAIN_DELEGATION_TOKEN

Namespace permissions (accumulo): Namespace.READ, Namespace.ALTER_TABLE

Table permissions (accumulo.metadata): Table.READ, Table.ALTER_TABLE
Table permissions (accumulo.replication): Table.READ
Table permissions (accumulo.root): Table.READ, Table.ALTER_TABLE
Table permissions (test): Table.READ, Table.WRITE, Table.BULK_IMPORT, Tabl
e.ALTER_TABLE, Table.GRANT, Table.DROP_TABLE, Table.GET_SUMMARIES
root@accumulo test> insert row f1 q1 v1
root@accumulo test> insert row f2 q2 v2
root@accumulo test> insert row f3 q3 v3
root@accumulo test> scan
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
root@accumulo test> deletetable
deletetable { test } (yes|no)? yes
Table: [test] has been deleted.
root@accumulo>
```

Installing Accumulo Parcel 1.10

Learn how to install the Accumulo parcel on your Cloudera Private Cloud Base environment.

Install Accumulo

Before installing the Accumulo, you first have to install Cloudera Manager and CDP cluster services, after that install the Accumulo CSD and the Accumulo Parcel. Ensure you verify your installation by running certain basic commands.

Install Accumulo CSD file

As Accumulo is an add-on service, you have to install its Custom Services Descriptor (CSD) file to manage the Accumulo on CDP service.

About this task

A Custom Services Descriptor (CSD) file contains all the configuration needed to describe and manage a new service. A CSD is provided in the form of a JAR file. For more information about CSD files, see the *Custom Service Descriptor Files* section in the *Add-on Services* documentation.

Before you begin

Install Cloudera Manager.

Procedure

1. Download the ACCUMULO_CDP-1.10.3_7.1.7.2000.0 jar file for the CSD that provides the Accumulo on CDP service.

   You can download that JAR file from:

   https://archive.cloudera.com/p/accumulo7/1.10.3_7.1.7.2000.0/
2. Copy the ACCUMULO_CDP-1.10.3_7.1.7.2000.0 file to the location where Cloudera Manager is configured to look for the CSD files. That is by default in the /opt/cloudera/csd folder on the host where Cloudera Manager is running.
3. Restart Cloudera Manager as described in the *Configuring the Location of Customer Service* section in the *Add-on Services* documentation.

What to do next

Install CDP cluster and services.

Related Information

Add-on Services

Install CDP

Before you install the Accumulo parcel, you have to install Cloudera Private Cloud Base and add the mandatory services.

The Accumulo service is only supported on Cloudera Private Cloud Base. For full cluster installation Cloudera recommends following the CDP Private Cloud Base Installation Guide.

For a FIPS-compliant Accumulo service, you have to follow the FIPS deployment CDP setup steps. For more information, see Installing and Configuring CDP with FIPS.

Ensure that you install the following mandatory services for Accumulo:

- HDFS

- ZooKeeper

Install Accumulo 1.10 parcel

After you have installed the Accumulo CSD and the required CDP cluster and services, you have to install the Accumulo parcel.

There are two options to install the Accumulo parcel:

- Using a Local Parcel Repository
- Using Remote Parcel Repository URLs (archive.cloudera.com)

Install Accumulo parcel using Local Parcel Repository

You can install the Accumulo Parcel using your Local Parcel Repository. For this, you have to download the parcel, copy it to your Local Parcel Repository, and then distribute and activate it using Cloudera Manager.

Before you begin

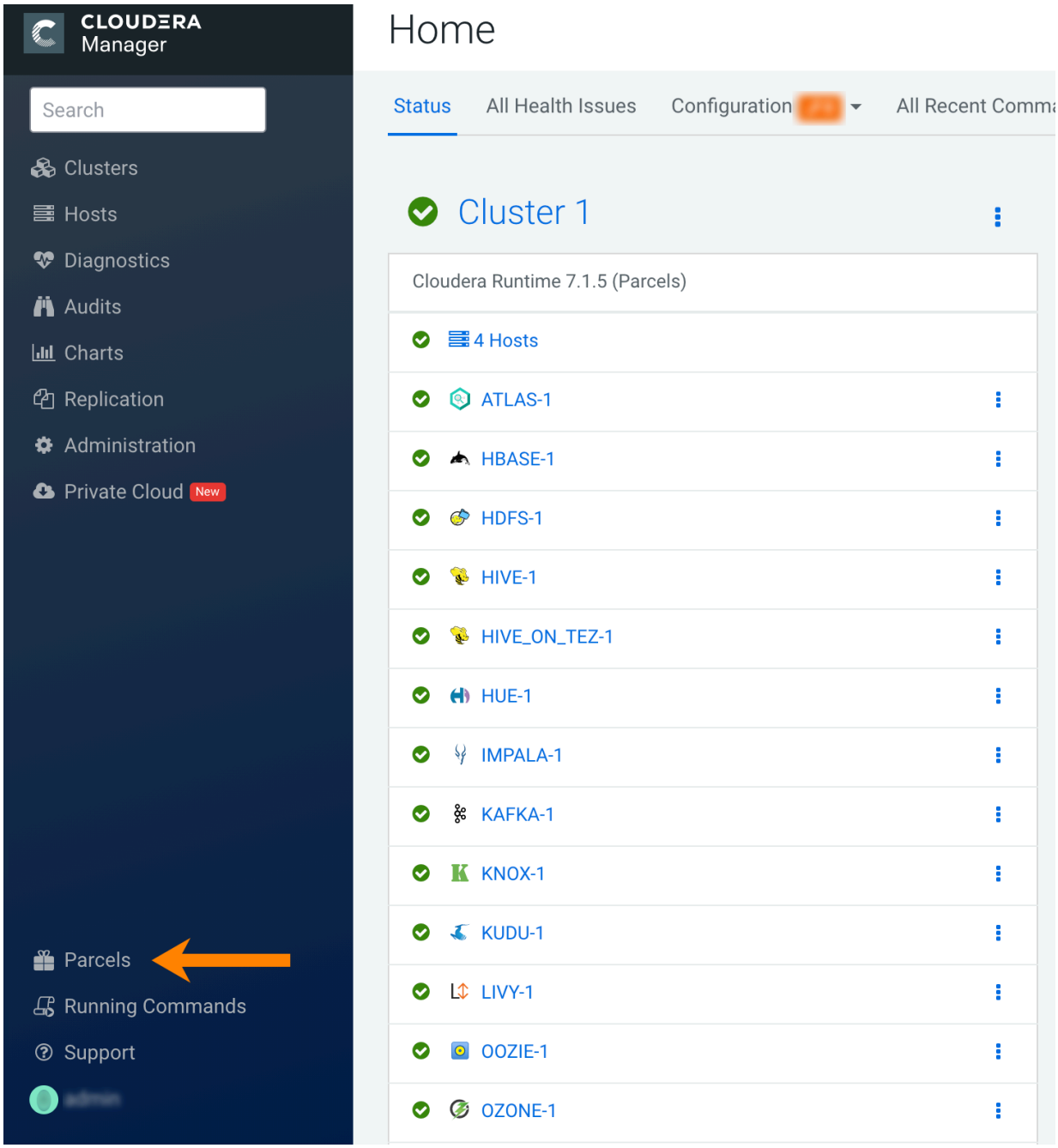
- Install the Accumulo CSD file
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

Procedure

1. Download the ACCUMULO_ON_CDP-1.10.3_7.1.7.2000.0.p0.43785444-el8.parcel Accumulo parcel from:

   https://archive.cloudera.com/p/accumulo7/1.10.3_7.1.7.2000.0/
2. Copy the ACCUMULO_ON_CDP-1.10.3_7.1.7.2000.0.p0.43785444-el8.parcel file to the Local Parcel Repository. The Local Parcel Repository is by default located in /opt/cloudera/parcel-repo directory on the host where Cloudera Manager is running.

3. In Cloudera Manager, navigate to Parcels.



4. Click Check for New Parcels.
   The ACCUMULO_ON_CDP-1.10.3_7.1.7.2000.0.p0.43785444-el8.parcel parcel appears in the Parcel list.
5. In the row of ACCUMULO_ON_CDP-1.10.3_7.1.7.2000.0.p0.43785444-el8.parcel, click Distribute.
6. After the distribution is completed, click Activate.

Results

The Accumulo parcel is installed.

What to do next

Add the Accumulo on CDP service.

Install Accumulo using Remote Parcel Repository

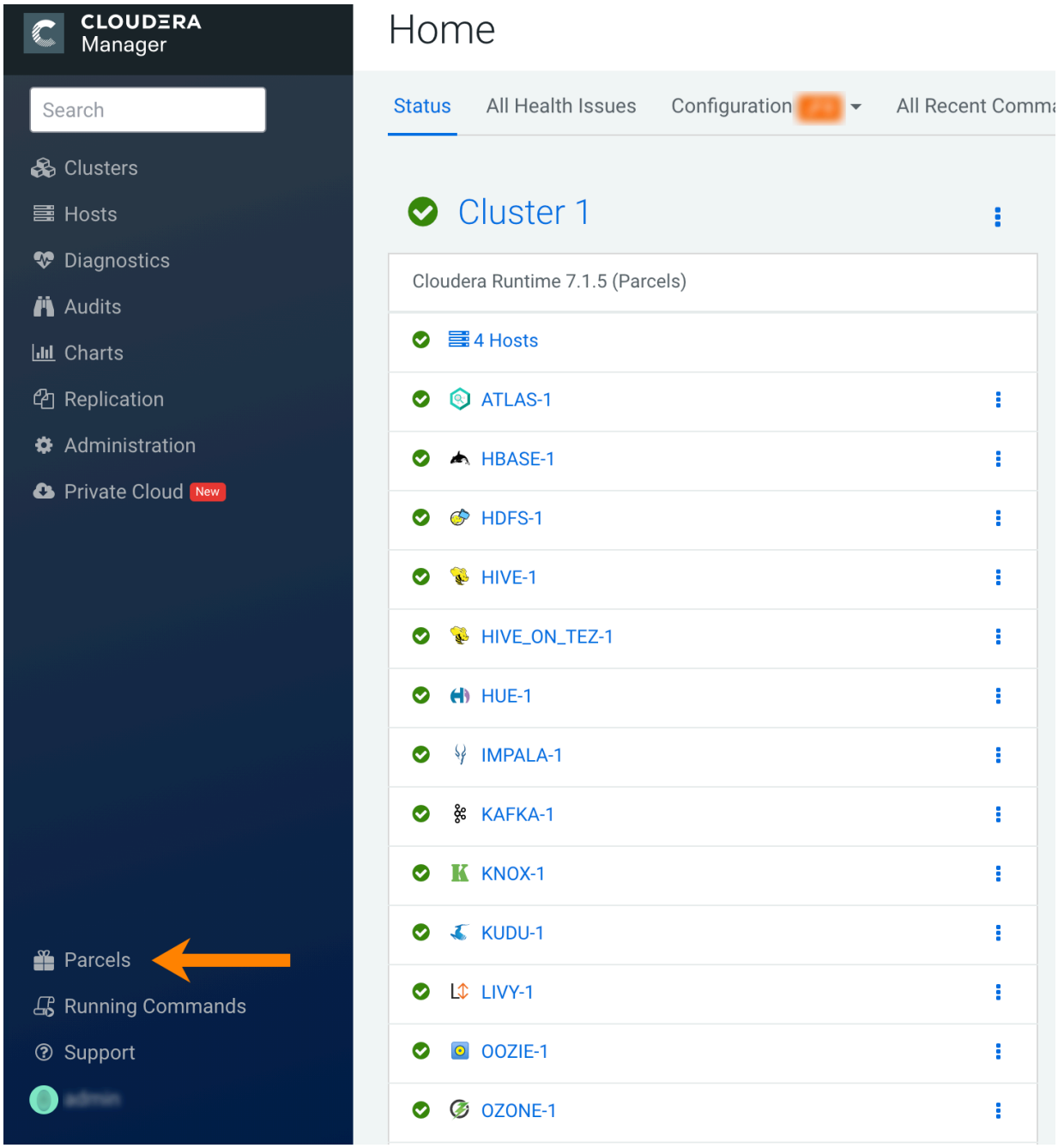
You can install the Accumulo parcel using the archive.cloudera.com Remote Parcel Repository.

Before you begin

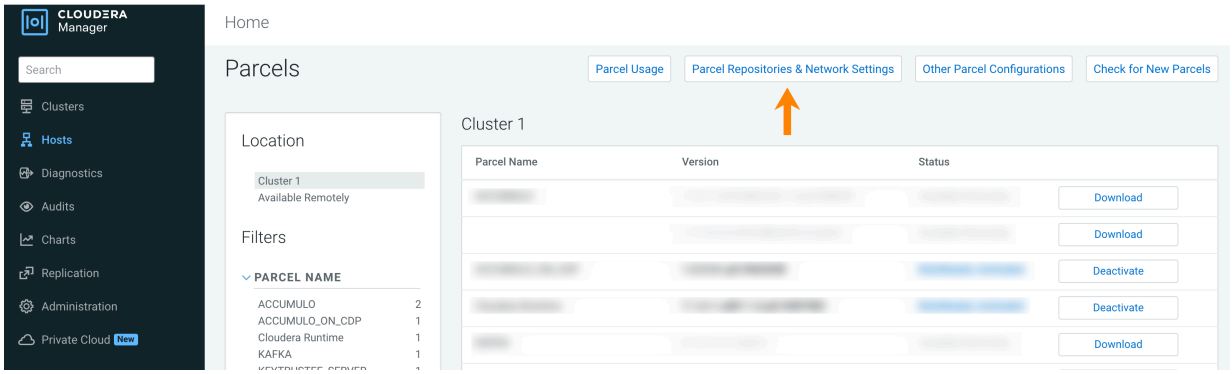
- Install the Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.

Procedure

1. In Cloudera Manager, navigate to Parcels.



2. Click Parcel Repositories & Network Settings.



3. In the Remote Parcel Repository URLs section, click ⊕ (Add Another) to include another remote parcel repository URL.
4. Add the following URL:

   https://archive.cloudera.com/p/accumulo7/1.10.3_7.1.7.2000.0/
5. Click Save & Verify Configuration.
6. In the row of ACCUMULO_ON_CDP 1.10.0.p0.11738502-el7.parcel, click Download.
7. After the download is completed, click Distribute.
8. Once the distribution is completed, click Activate.

What to do next
Add the Accumulo on CDP service.

Add Accumulo on CDP service

After you have installed the Accumulo CSD, the required CDP cluster and services, and the Accumulo parcel, you can add the Accumulo on CDP service to your cluster.

You can add a secure or an unsecured Accumulo on CDP service to your Cloudera Private Cloud Base deployment when installing Accumulo. A secure Accumulo on CDP service requires a secure cluster, which means an SASL-enabled Kerberized cluster.

The steps to add a secure Accumulo on CDP service are different from the steps to add an unsecure Accumulo on CDP service. If you require a FIPS compliant Accumulo service, follow the steps in the Add secure Accumulo on CDP service to your cluster.

Add unsecure Accumulo on CDP service to your cluster
If your cluster is not an SASL enabled Kerberized cluster, add an unsecure Accumulo on CDP service to your cluster when installing Accumulo.

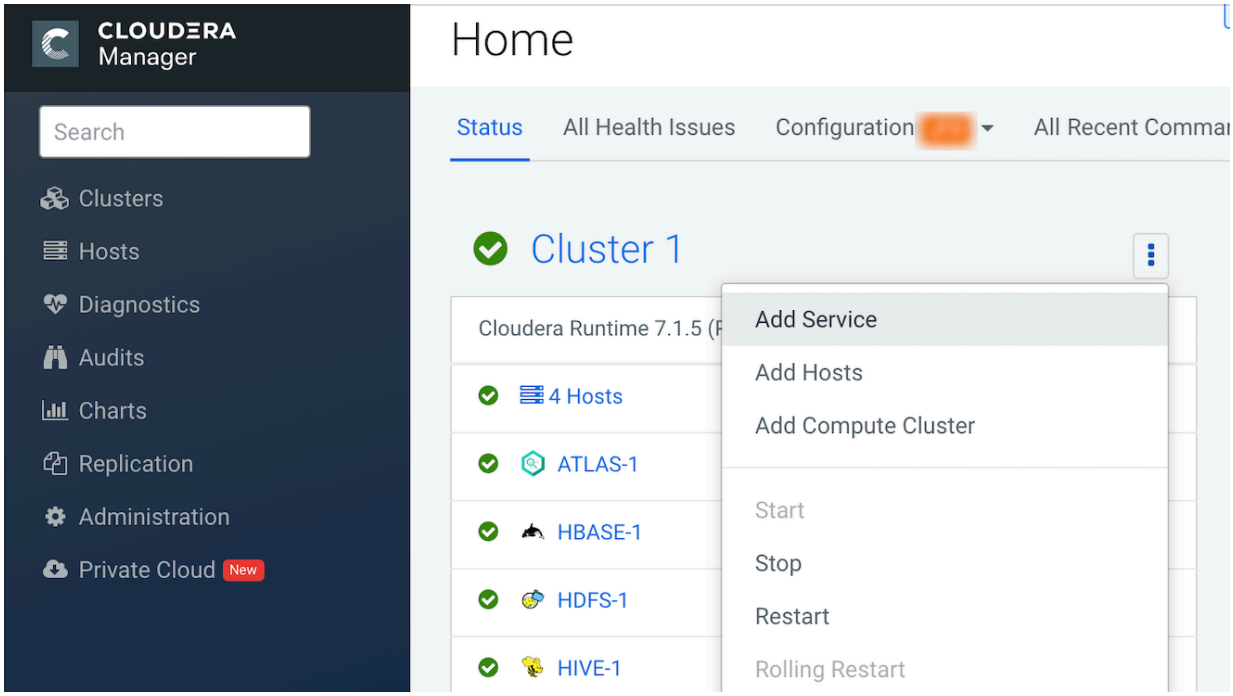
Before you begin

- Install Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the Accumulo parcel.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.

2. Click the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, Tracer, and Master role to non-DataNodes.
   - Assign the Gateway role to any hosts where you want to use the Accumulo on CDP service, and where you do not already have any other Accumulo roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.
9. Set the Trace User and Trace Password settings.

   It is recommended that you not leave the Trace User set to root, because this is not a secure configuration.
10. If this is the first installation of Accumulo, ensure that the Initial Accumulo option is selected.
11. Click Continue.
12. Wait while the Cloudera Manager does the initial service setup.
13. Click Continue.
14. Click Finish.

What to do next

Ensure that the trace user and trace table exist.

Add secure Accumulo on CDP service to your cluster

To ensure data availability to diverse sets of users with varying levels of permissions and security clearance, add a secure Accumulo on CDP service.

About this task

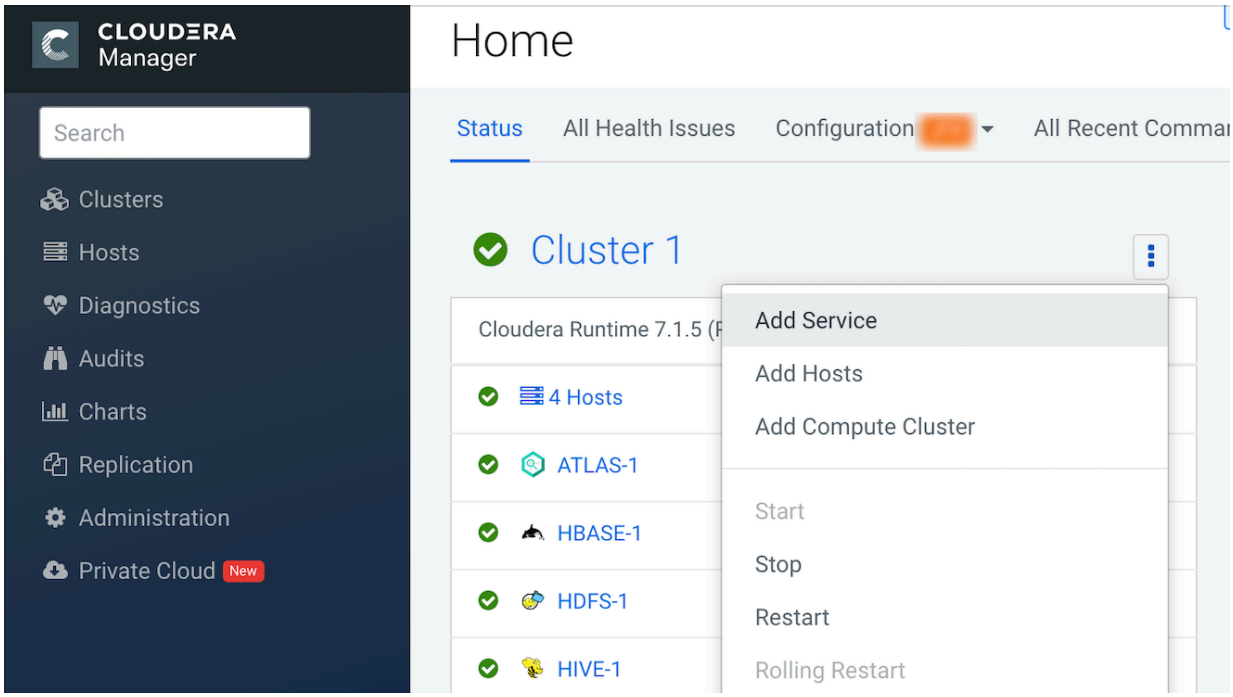
If your secure Accumulo on CDP service needs to be FIPS compliant, ensure that you have followed the FIPS specific deployment setup steps provided in Installing and Configuring CDP with FIPS.

Before you begin

- Install Accumulo CSD file.
- Install CDP.
- Add the HDFS and ZooKeeper services to your CDP deployment.
- Install the Accumulo parcel.
- Ensure that you have a SASL enabled Kerberized cluster.

Procedure

1. Navigate to the Cloudera Manager Admin Console home page.
2. Select the action menu of the cluster to which you want to add the Accumulo on CDP service (for example, Cluster 1), and select Add Service.



3. Select Accumulo on CDP and click Continue.
4. Select the dependent services and click Continue.
5. Assign the Accumulo roles to the hosts in your cluster:
   - Assign a Table Server role on each host to which the DataNode role is assigned.
   - Assign the Monitor, Garbage Collector, Tracer, and Master role to non-DataNodes. Ensure that the Tracer Role is on the same node as the Master.
   - Assign the Gateway role to any hosts here you want to use the Accumulo service and that do not already have other Accumulo roles assigned.
6. Click Continue.
7. Configure the Accumulo Instance Secret.

   Important: Cloudera recommends to protect this information, because the security of the Accumulo service relies on it.

8. Set the Accumulo Instance Name.

9. Select Enable Kerberos Authentication.

   Note: This setting overwrites the trace user with the default Accumulo Kerberos principal. This is the reason the Tracer Role must be on the same node as the Master.

10. If this is the first installation of Accumulo, ensure that the Initial Accumulo option is selected.
11. Click Continue.
12. Wait while Cloudera Manager does the initial service setup.
13. Click Continue.
14. Click Finish.
15. Restart all role except Tracers.
16. Create a client configuration file for the admin user.

    This step needs to be performed on each Gateway machine where you will run an Accumulo client.

    Client configuration can be created by editing the configuration file in the following way:

    ```
    instance.rpc.sasl.enabled=true
    rpc.sasl.qop=auth-conf
    kerberos.server.primary=accumulo
    ```

    By default, the Accumulo principal on which master is running becomes the administrator principal. You can set up a different administrative user. For more information, see the Administrative User section of the user manual. In this case you need to change the auth.principal and auth.token configuration properties accordingly.

What to do next

Ensure that the trace table exists.

Creating a trace user in unsecure Accumulo deployment

After you add an unsecure Accumulo on CDP service, you have to ensure that the trace user exists. This step is only required if you have an unsecure Accumulo deployment.

About this task

This step is not required if you have a secure Accumulo deployment, because in that case the trace user is automatically created when the Accumulo on CDP service is added to the cluster.

Before you begin

- Install the Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the Accumulo parcel.
- Add an unsecure Accumulo on CDP to your deployment.

Ensure that you have added an unsecure Accumulo service to your cluster.

Procedure

1. Launch the Accumulo shell for the admin user.

   ```
   $ accumulo shell -u root
   Password: ******
   Shell - Apache Accumulo Interactive Shell
   -
   - version: [***ACCUMULO VERSION NUMBER***]
   - instance name: [***ACCUMULO INSTANCE NAME***]
   - instance id: [***ACCUMULO INSTANCE ID***]
   -
   ```

```
- type 'help' for a list of available commands
-
root@accumulo>
```

2. List the existing users and check if trace user exists: users

   If the trace user exists, you can continue your Accumulo installation.

3. If the trace user does not exist, create it with the following command: createuser trace

What to do next

Ensure that the trace table exists.

Check trace table

After you have added the Accumulo on CDP service as a part of the Accumulo installation, you have to check whether the trace table, that records the time span of operations, exists.

About this task

Accumulo records the time that various operations take when tracing is turned on. It follows all the requests made on behalf of the user throughout the distributed infrastructure of Accumulo, and across all threads of execution.

These timespans are inserted into the trace table in Accumulo. You can browse recent traces from the Accumulo monitor page. You can also read the trace table directly like any other table.

Before you begin

- Install the Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the Accumulo parcel.
- Add the Accumulo on CDP service to your deployment.

Procedure

1. Launch the Accumulo shell for the admin user.

   - Unsecure Accumulo

     ```
     $ accumulo shell -u root
     Password: ******
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     -
     - type 'help' for a list of available commands
     -
     root@accumulo>
     ```

   - Secure Accumulo

     ```
     kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
     ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
     HOSTNAME***]
     accumulo shell
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     -
     ```

```
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. List tables and check if the trace table exists.

```
> tables
accumulo.metadata
accumulo.replication
accumulo.root
trace
>
```

3. If the trace table does not exist, create it with the following command: createtable trace.

What to do next

Provide user permissions.

Provide user permissions

After the Accumulo on CDP service is added as part of the Accumulo, you have to provide privileges to the principal in which the Tracer is running.

Before you begin

- Install the Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the Accumulo parcel.
- Add the Accumulo on CDP service.
- Check the trace table.

Procedure

1. Launch the Accumulo shell for the admin user.
   - Unsecure Accumulo

```
$ accumulo shell -u root
Password: ******
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
- type 'help' for a list of available commands
-
root@accumulo>
```

   - Secure Accumulo

```
kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
HOSTNAME***]
accumulo shell
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
```

```
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. Add READ, WRITE, and ALTER_TABLE privileges to the principal in which the Tracer is running.
   - Unsecure Accumulo

     ```
     grant Table.READ -t trace -u trace
     grant Table.WRITE -t trace -u trace
     grant Table.ALTER_TABLE -t trace -u trace
     ```

   - Secure Accumulo

     ```
     'grant Table.READ -t trace -u accumulo/hostname@REALM.COM'
     'grant Table.WRITE -t trace -u accumulo/hostname@REALM.COM'
     'grant Table.ALTER_TABLE -t trace -u accumulo/hostname@REALM.COM'
     ```

   In an unsecure Accumulo deployment if you have configured the trace user with a _HOST instance component, you must repeat this command with an instance for each host that will run a Tracer or Monitor role.
3. Start all Tracer roles.

What to do next

Verify your Accumulo installation.

Verify your Accumulo installation

You can verify your Accumulo installation using the Accumulo shell.

Before you begin

- Install the Accumulo CSD file.
- Install CDP and add the HDFS and ZooKeeper services to your deployment.
- Install the Accumulo parcel.
- Add the Accumulo on CDP service to your deployment.
- Check trace table.
- Provide user permissions.

Procedure

1. Launch the Accumulo shell for the admin user.
   - Unsecure Accumulo

     ```
     $ accumulo shell -u root
     Password: ******
     Shell - Apache Accumulo Interactive Shell
     -
     - version: [***ACCUMULO VERSION NUMBER***]
     - instance name: [***ACCUMULO INSTANCE NAME***]
     - instance id: [***ACCUMULO INSTANCE ID***]
     -
     - type 'help' for a list of available commands
     -
     root@accumulo>
     ```

   - Secure Accumulo

     ```
     kinit -kt /var/run/cloudera-scm-agent/process/[***TIMESTAMP***]-[***SERV
     ICE NAME***]-[***INSTANCE NAME***]/accumulo_on_cdp.keytab accumulo/$[***
     HOSTNAME***]
     ```

```
accumulo shell
Shell - Apache Accumulo Interactive Shell
-
- version: [***ACCUMULO VERSION NUMBER***]
- instance name: [***ACCUMULO INSTANCE NAME***]
- instance id: [***ACCUMULO INSTANCE ID***]
-
- type 'help' for a list of available commands
-
accumulo/hostname@REALM.COM@accumulo>
```

2. Run the following commands to verify your installation:
   a) Create a table: createtable test
      The test table is created and becomes the current table.
   b) Grant permission to READ or WRITE on the newly created table. For more information, see *Provide user permissions*.
   c) Run the following command to provide an additional permission to delete a table.

```
grant Table.DROP_TABLE -t test -u accumulo/hostname@REALM.COM
```

   d) List the admin user's permission and ensure it has admin and system level privileges: userpermission
   e) Insert some rows to the test table:

```
insert row f1 q1 v1
insert row f2 q2 v2
insert row f3 q3 v3
```

   f) Scan the table: scan

```
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
```

   g) Delete the test table: root@accumulo test> deletetable
      Table: [test] has been deleted.

Example

The following example shows the verification of an unsecured Accumulo installation:

```
root@accumulo> createtable test
root@accumulo test> userpermissions
System permissions: System.GRANT, System.CREATE_TABLE, System.DROP_TABLE, Sy
stem.ALTER_TABLE, System.CREATE_USER, System.DROP_USER, System.ALTER_USER, S
ystem.SYSTEM, System.CREATE_NAMESPACE, System.DROP_NAMESPACE, System.ALTER_N
AMESPACE, System.OBTAIN_DELEGATION_TOKEN

Namespace permissions (accumulo): Namespace.READ, Namespace.ALTER_TABLE

Table permissions (accumulo.metadata): Table.READ, Table.ALTER_TABLE
Table permissions (accumulo.replication): Table.READ
Table permissions (accumulo.root): Table.READ, Table.ALTER_TABLE
Table permissions (test): Table.READ, Table.WRITE, Table.BULK_IMPORT, Tabl
e.ALTER_TABLE, Table.GRANT, Table.DROP_TABLE, Table.GET_SUMMARIES
Table permissions (trace): Table.READ, Table.WRITE, Table.BULK_IMPORT, Tab
le.ALTER_TABLE, Table.GRANT, Table.DROP_TABLE, Table.GET_SUMMARIES
root@accumulo test> insert row f1 q1 v1
root@accumulo test> insert row f2 q2 v2
root@accumulo test> insert row f3 q3 v3
root@accumulo test> scan
row f1:q1 [] v1
row f2:q2 [] v2
row f3:q3 [] v3
```

```
root@accumulo test> deletetable
deletetable { test } (yes|no)? yes
Table: [test] has been deleted.
root@accumulo>
```