Cloudera Runtime 7.2.11

Managing Apache ZooKeeper

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Add a ZooKeeper service

If the Add Service wizard does not finish successfully, you can add the ZooKeeper service manually.

About this task

In a production environment, you msut deploy ZooKeeper as an ensemble with an odd number of servers. As long as a majority of the servers in the ensemble are available, the ZooKeeper service will be available. The minimum recommended ensemble size is three ZooKeeper servers, and Cloudera recommends that each server run on a separate machine. In addition, the ZooKeeper server process should have its own dedicated disk storage if possible.

Note: If a customer has experienced fsync delays and other I/O related issues with ZooKeeper, ZooKeeper's dataDir and dataLogDir can be configured to use separate disks. It is hard to determine ahead of time whether this will be necessary; even a small cluster can result in heavy ZooKeeper activity.

When adding the ZooKeeper service, the Add Service wizard automatically initializes the data directories.

When you add Zookeeper servers to an existing ensemble, a rolling restart of all Zookeeper is required in order to allow all Zookeeper servers to have the same configurations.

If you quit the Add Service wizard or it does not finish successfully, you can initialize the directories outside the wizard by following these steps:

Procedure

1. In Cloudera Manager, select the ZooKeeper service.
2. Click Action.
3. Select Initialize.
4. Click Initialize again to confirm.

   If the data directories are not initialized, the ZooKeeper servers cannot be started.

Use multiple ZooKeeper services

Only services that are not dependent can use different ZooKeeper services.

Cloudera Manager requires dependent services within Cloudera Runtime to use the same ZooKeeper service. If you configure dependent Cloudera Runtime services to use different ZooKeeper services, Cloudera Manager reports the following error:

```
com.cloudera.cmf.command.CmdExecException:java.lang.RuntimeException: java.l
ang.IllegalStateException: Assumption violated:
getAllDependencies returned multiple distinct services of the same type
at SeqFlowCmd.java line 120
in com.cloudera.cmf.command.flow.SeqFlowCmd run()
```

Because of a known limitation in Cloudera Manager, Cloudera Runtime services that are depending on each other can not use different ZooKeeper services. For example, Kafka does not depend on any services other than ZooKeeper, so Kafka can use one ZooKeeper cluster and the rest of the Cloudera Runtime services can use another one. At the same time, since Ranger also depends on ZooKeeper, if Kafka gets configured to use Ranger, then both Kafka and Ranger must use the same ZooKeeper cluster.

Replace a ZooKeeper disk

You can replace a ZooKeeper Disk but first you must stop the ZooKeeper role.

About this task

Procedure

1. In Cloudera Manager, select the ZooKeeper service.
2. Click the Configuration tab.
3. Search for data directory.
4. Find the Data Directory property and update as applicable.
5. Find the Transaction Log Directory property and update as applicable.
6. Click Save Chages.
7. Click the Instances tab.
8. Select one ZooKeeper role.
9. Click the Actions for Selected button.
10. Select Stop.
11. Move the contents to the new disk location and modify mounts as needed.
    Ensure that the permissions and ownership are correct.
12. Select the same ZooKeeper role.
13. Click the Actions for Selected button.
14. Select Start.
15. Repeat step 8-14 for any remaining ZooKeeper roles.

Update the Data and Transaction Log Directory

You can update the Data and Transaction Log Directory for ZooKeeper Service.

About this task

These instructions must be performed to update the Data and Transaction Log Directory for a ZooKeeper role. Ensure to stop the ZooKeeper role on the host you wish to update.

Procedure

1. In Cloudera Manager, access the ZooKeeper service Configuration page
2. Search for the Data Directory (dataDir) and Transaction Log Directory (dataLogDir) and modify it.
3. Save the changes
4. Move the contents from the old dataDir/dataLogDir to the new location on the host. Make sure the permissions are intact in the new disk, same as the old dataDir/dataLogDir
5. Start the ZooKeeper role on the host
6. Repeat for the remaining ZooKeeper roles. You can perform these steps on all of the nodes at the same time, unless there is a downtime

Replace a ZooKeeper role with ZooKeeper service downtime

Replace a ZooKeeper role with ZooKeeper service downtime.

Procedure

1. In Cloudera Manager, select the ZooKeeper service.
2. Click the Instances tab.
3. Select the ZooKeeper role on the old host.
4. Click the Actions for Selected button.
5. Select Stop.
6. Click the Actions for Selected button.
7. Select Delete.
8. Click the Add Role Instances button.
9. Select the new host.
10. Click Continue.
11. Confirm the changes.
12. Click Continue.
13. Restart the old ZooKeeper servers that have outdated configuration.
14. Select the ZooKeeper service.
15. Click the Status tab.
16. Confirm the ZooKeeper service elected one of the restarted hosts as a leader.
17. Restart the newly added ZooKeeper server.
18. Restart any dependent services, such as HBase, HDFS, YARN or Hive, that are marked to have stale configuration.

Replace a ZooKeeper role without ZooKeeper service downtime

If server to server SASL authentication is not enabled, you can replace a ZooKeeper role without ZooKeeper service downtime.

About this task

This process is valid only if the SASL authentication is not enabled between the ZooKeeper servers. You can check this in Cloudera Manager, if you see the Enable Server to Server SASL Authentication under the Configuration of ZooKeeper.

Procedure

1. Stop the ZooKeeper role on the old host.
2. Confirm the ZooKeeper service has elected one of the remaining hosts as a leader on the service Status page.
3. On the ZooKeeper Instances page, stop the ZooKeeper role on the old host then Delete the role instance
4. Add the new ZooKeeper role instance on the new host, this new instance appears in the list in Down state.
5. Rolling restart all the other unmigrated and running ZookeeperServer instances.

6. Start the newly added ZookeeperServer instance.
7. Confirm that a leader has been elected and the whole Zookeeper service is in green state.
8. Using the cluster Action menu perform a Deploy Client Configuration and Refresh.
9. Restart any dependent services such as HBase, HDFS, YARN, Hive, and other services that are marked to have stale configuration. If any service is deployed in highly available and/or load balancing configuration it is adviseable to perform a rolling restart the role instance to avoid the service outage. The only exception is the HBase service because rolling restarting the RegionServer roles generates region unassignment/assignemnt storms which significantly lengthen the service restart time and can trigger region assignment related failures, such as RITs, that requires manual intervention. Hence, for the HBase service we recommend the clean service stop and start. This is the only service which the ZookeeperServer instance migration results in shorter or longer outage depending on the number of the regions and the RegionServers.
10.  **Note:**

    Recommended instance restart sequence:

    a. Atlas Server
    b. Knox Gateway
    c. Livy Server
    d. Omid TSO Server
    e. Ranger (Admin, Tagsync, Usersync)
    f. Ranger KMS Server
    g. Ranger RMS Server
    h. SchemaRegistry Server
    i. Zeppelin Server
    j. HUE Server
    k. Oozie Server
    l. Impala Server
    m. Kudu Server (Master- and TabletServer)
    n. HIve MetaStore Server
    o. HiveServer2
    p. Sqoop Client
    q. Kafka Brokers
    r. HDFS (FailoverController, Quorum JournalNode, NameNode, DataNode, HTTPFS Gateway)
    s. Ozone (Storage Container Manager, Manager, Recon, Prometheus, DataNode, S3 Gateway, HTTPFS Gateway)
    t. Solr Server
    u. Spark History Server
    v. YARN QueueManager (Store, WebApp)
    w. YARN (ResourceManager, NodeManager)
    x. Phoenix Query Server
    y. HBase (MasterServer, RegionServer)

Replace a ZooKeeper role on an unmanaged cluster

You can replace a ZooKeeper Role on an unmanaged cluster, using command line.

About this task

These instructions assume you are using ZooKeeper from the command line.

Procedure

1. Stop the ZooKeeper role on the old host.
2. Confirm the ZooKeeper Quorum elected a leader.
3. Add a new ZooKeeper role on the new server.
4. Identify the dataDir locatiom from the zoo.cfg file.

   This default to /var/lib/zookeeper.
5. Identify the ID number for the ZooKeeper Server from the myid file in the configuration: cat*/VAR/LIB/ZOOKEEPER*/myid.
6. On all the ZooKeeper hosts, edit the zoo.cfg file, so the server ID references the new server hostname.

   For example:

   ```
   server.1=zk1.example.org:3181:4181 server.2=zk2.example.org:3181:4181 se
   rver.4=zk4.example.org:3181:4181
   ```
7. Restart the ZooKeeper hosts.
8. Confirm the ZooKeeper Quorum elected a leader and the other hosts are followers.
9. Restart any dependent services, such as HBase, HDFS Failover Controllers with HDFS High Availability, or YARN with High Availability.
10. Perform a failover to make on HDFS NameNode active.

Confirm the election status of a ZooKeeper service

You can determine the election status of a ZooKeeper host if you have installed telnet ot netcat and it runs from a host with network access to the ZooKeeper host.

The default ZooKeeper client port is 2181. Run the following command against each ZooKeeper host:

```
echo "stat" | nc server.example.org 2181 | grep Mode
```

For example, a follower host would return the message:

```
Mode: follower
```

You can use telnet, if you prefer:

```
$ telnet server.example.org 2181
```

Sample output would be similar to the following:

```
Trying 10.1.2.154...
Connected to server.example.org.
Escape character is '^]'.
stat
Zookeeper version: 3.4.5-cdh5.4.4--1, built on 07/06/2015 23:54 GMT
...

Latency min/avg/max: 0/1/40
Received: 631
Sent: 677
Connections: 7
Outstanding: 0
Zxid: 0x30000011a
Mode: follower                <----
Node count: 40
```

```
Connection closed by foreign host.
```