

Tuning Apache Impala

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Setting Up HDFS Caching

Set up HDFS caching with Impala for improved performance.

Before you begin

Decide how much memory to devote to the HDFS cache on each host. The total memory available for cached data is the sum of the cache sizes on all the hosts. By default, any data block is only cached on one host although you can cache a block across multiple hosts by increasing the replication factor.

Procedure

1. Enable or disable HDFS caching through Cloudera Manager, using the configuration setting Maximum Memory Used for Caching for the HDFS service.

This control sets the HDFS configuration parameter `dfs_datanode_max_locked_memory`, which specifies the upper limit of HDFS cache size on each node. Set up the HDFS caching for your Hadoop cluster.

- All the other manipulation of the HDFS caching settings, such as what files are cached, is done through the command line, either Impala DDL statements or the Linux `hdfs cacheadmin` command.

2. Using the `hdfs cacheadmin` command, set up one or more pools owned by the same user as the `impalad` daemon (typically `impala`).

For example:

```
hdfs cacheadmin -addPool four_gig_pool -owner impala -limit 4000000000
```

3. Once HDFS caching is enabled and one or more pools are available, on the Impala side, you specify the cache pool name defined by the `hdfs cacheadmin` command in the Impala DDL statements that enable HDFS caching for a table or partition, such as `CREATE TABLE ... CACHED IN pool` or `ALTER TABLE ... SET CACHED IN pool`.
4. You can use `hdfs cacheadmin -listDirectives` to get a list of existing cache pools.
5. You can use `hdfs cacheadmin -listDirectives -stats` to get detailed information about the pools.

Setting up Data Cache for Remote Reads

When Impala compute nodes and its storage are not co-located, the network bandwidth requirement goes up as the network traffic includes the data fetch as well as the shuffling exchange traffic of intermediate results. To mitigate the pressure on the network, you can enable the compute nodes to cache the working set read from remote filesystems, such as, remote HDFS data node, S3, ABFS, ADLS.

About this task

To enable remote data cache as follows.

Procedure

1. In Cloudera Manager, navigate to ClustersImpala Service.
2. In the Configuration tab, select Enable Local Data Cache to enable the local Impala Daemon data cache for caching of remote reads.
3. In Impala Daemon Data Cache Directories, add the directories Impala Daemon will use for caching of remote read data.
4. In Impala Daemon Data Cache Per Directory Capacity, specify the maximum amount of local disk space Impala will use per daemon in each of the configured directories for caching of remote read data.

5. Click Save Changes and restart the Impala service.

Configuring Dedicated Coordinators and Executors

Configure a dedicated coordinator and a dedicated executor roles to improve scalability of Impala.

Guidelines for Dedicated Coordinators and Executors

- Dedicated coordinator:
 - Should be on an edge node with no other services running on it.
 - Does not need large local disks but still needs some that can be used for Spilling.
 - Require at least the same or even larger memory allocation than executors.
- (Dedicated)Executors:
 - Should be co-located with DataNodes.
 - The number of hosts with dedicated executors typically increases as the cluster grows larger and handles more table partitions, data files, and concurrent queries.

Procedure

1. In Cloudera Manager, navigate to ClustersImpalaConfigurationRole Groups.
2. Click Create to create two role groups with the following values.
 - a) Group for Coordinators
 1. Group Name: Coordinators
 2. Role Type: Impala Daemon
 3. Copy from:
 - Select Impala Daemon Default Group if you want the existing configuration gets carried over to the Coordinators.
 - Select None if you want to start with a blank configuration.
 - b) Group for Executors
 1. Group Name: Executors
 2. Role Type: Impala Daemon
 3. Copy from:
 - Select Impala Daemon Default Group if you want the existing configuration gets carried over to the Executors.
 - Select None if you want to start with a blank configuration.
3. In the Role Groups page, click Impala Daemon Default Group.
 - a) Select the set of nodes intended to be coordinators.
 1. Click Action for Selected and select Move To Different Role Group....
 2. Select the Coordinators.
 - b) Select the set of nodes intended to be Executors.
 1. Click Action for Selected and select Move To Different Role Group....
 2. Select the Executors.
4. Click Configuration. In the search field, type Impala Daemon Specialization.
5. Click Edit Individual Values.
6. For Coordinators role group, select COORDINATOR_ONLY.
7. For Executors role group, select EXECUTOR_ONLY.
8. Click Save Changes and then restart the Impala service.

Related Information[Dedicated Coordinator](#)