Elastic MapReduce

Getting Started

Product Documentation

Contents

Getting Started
EMR on CVM Quick Start

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This document introduces the process of quickly creating an EMR on CVM cluster through the EMR console, submitting a job, and viewing the results.

Preparations

1. Before using an EMR cluster, you need to register a Tencent Cloud account and complete identity verification. For detailed directions, see Enterprise Identity Verification Guide.
2. Grant the system default role EMR_QCSRole to the service account for EMR. For detailed directions, see Role Authorization.
3. For online account recharge, EMR on CVM offers two billing modes: pay-as-you-go and monthly subscription. Before creating a cluster, you need to recharge your account balance to ensure it is greater than or equal to the configuration fees required for cluster creation, excluding promo vouchers. For detailed directions, see Top-up.

Creating Clusters

Log in to the EMR Console, click **Create Cluster** on the EMR on CVM cluster list page, and complete the relevant configuration on the purchase page. When the cluster status shows Running, it indicates that the cluster has been successfully created.

Purchase Steps	Configuration Item	Configuration Items Description	Example
Software configuration	Region	The physical data center where the cluster is deployed. Note: Once the cluster is created, the region cannot be changed, so choose carefully.	Beijing, Shanghai, Guangzhou, Nanjing, Chengdu, and Silicon Valley
	Cluster type	EMR on CVM supports multiple cluster types, with Hadoop being the default cluster type.	Hadoop and StarRocks
	Product version	The components and their versions bundled with different product versions vary.	EMR-V2.7.0 includes Hadoop 2.8.5 and Spark 3.2.1.

	Deployment components	Optional components that can be customized and combined based on your needs.	Hive-2.3.9 and Impala-3.4.1.
Region and hardware configuration	Billing mode	Billing mode for cluster deployment	Pay-as-You-go
	Availability zone (AZ) and network configuration	AZ and cluster network settings. Note: Once the cluster is created, the AZ cannot be directly changed, so choose carefully.	Guangzhou Zone 7.
	Secure login	Network access control settings for nodes, with a security group firewall feature.	Create a security group.
	Node configuration	Select the appropriate model configuration for different node types based on business requirements. For more details, see Business Evaluation.	Enable high availability for node deployment.
Basic configuration	Associated project	Assign the current cluster to different project groups.	The associated project cannot be modified once the cluster is created.
	Cluster name	The name of the cluster, which is customizable.	EMR-7sx2aqmu
	Login method	Custom password setup and key association. SSH keys are used only for quick access through the EMR-UI.	Password.
Confirm configuration	Configuration list	Confirm if there is any error in the deployment information.	Select the terms of service and click Buy Now.

Note

You can view the information of each node in the CVM console. To ensure the normal operation of the EMR cluster, do not change the node configuration in the CVM console.

Submitting Jobs and Viewing Results

After the cluster is successfully created, you can create and submit jobs on that cluster. This document uses a submitted Spark task as an example, with the following steps.

Note

When creating an EMR cluster, you need to select the Spark component in the software configuration interface.

1. Use SSH to log in and connect to the cluster (the local system is Linux/Mac OS). For more details, see Login to Cluster.

2. In the EMR command line, use the following commands to switch to the Hadoop user and navigate to the Spark installation directory /usr/local/service/spark:

```
[root@172 ~]# su hadoop
[hadoop@172 root]$ cd /usr/local/service/spark
```

3. Submit and run the task using the following command:

```
/usr/local/service/spark/bin/spark-submit \\
--class org.apache.spark.examples.SparkPi \\
--master yarn \\
--deploy-mode cluster \\
--proxy-user hadoop \\
--driver-memory 1g \\
--executor-memory 1g \\
--executor-cores 1 \\
/usr/local/service/spark/examples/jars/spark-examples*.jar \\
10
```

4. After the job is submitted, on the EMR on CVM page, click **Cluster Services** in the row of the target cluster, and then click the **WebUI link** in the row of YARN UI. After logging in, you will enter the YARN UI page. Click the **ID** of the target job to view the job's detailed running information.

Terminating Clusters

When the created cluster is no longer needed, you can terminate the cluster and return the resources. Terminating the cluster will forcibly stop all services provided by the cluster and release the resources.

On the EMR on CVM page, select **Terminate** from the More options for the target cluster. In the pop-up dialog box, click **Terminate Now**.

EMR on TKE Quick Start

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This document introduces the complete process of quickly creating an EMR on TKE cluster through the EMR console, submitting a job, and viewing the results.

Preparations

1. Before using an EMR cluster, you need to register a Tencent Cloud account and complete identity verification. For detailed directions, see Enterprise Identity Verification Guide.
2. Grant the system default role EMR_QCSRole to the service account for EMR. For detailed directions, see Role Authorization.
3. Complete the authorization of the service account for EMR with the relevant roles. For detailed directions, see Administrative Privileges.
4. For online account recharge, EMR on TKE offers pay-as-you-go billing. Before creating a cluster, you need to recharge your account balance to ensure it is greater than or equal to the configuration fees required for cluster creation, excluding vouchers, and other promotions. For detailed instructions, see Top-up.

Creating Clusters

Log in to the EMR Console, click **Create Cluster** on the EMR on TKE cluster list page, and complete the relevant configuration on the purchase page. When the cluster status shows Running, it indicates that the cluster has been successfully created.

Configuration Item	Configuration Items Description	Example
Cluster name	The name of the cluster, which is customizable.	EMR-7sx2aqmu
Region	The physical data center where the cluster is deployed. Note: Once the cluster is created, the region cannot be changed, so choose carefully.	Beijing, Shanghai, Guangzhou, Nanjing, and Singapore.
Container type	The service role is deployed by using resources provided by the container layer, supporting both TKE General and TKE Serverless clusters.	TKE
Cluster	Used for purchasing a db. It is necessary to ensure	Guangzhou Zone 7.

network and subnet	that the EMR cluster network is consistent with the container cluster network.	
Security group	Configure security groups at the cluster level.	Create a security group.
Billing mode	Billing mode for cluster deployment	Pay-as-You-go
Product version	The components and their versions bundled with different product versions vary.	EMR-TKE1.0.0 includes Hadoop 2.8.5 and Spark 3.2.1.
Deployment service	Optional components that can be customized and combined based on your needs. Select at least one component.	Hive-2.3.9 and Impala-3.4.1.
COS bucket	Used for storing logs, JAR packages, and other information.	-
Set Password	Set the webUI password. The current password is only used to initially set up the service webUI access password.	8-16 characters, including uppercase letters, lowercase letters, numbers, and special characters. Special characters supported are !@%^*, and the password cannot start with a special character.

Submitting Jobs and Viewing Results

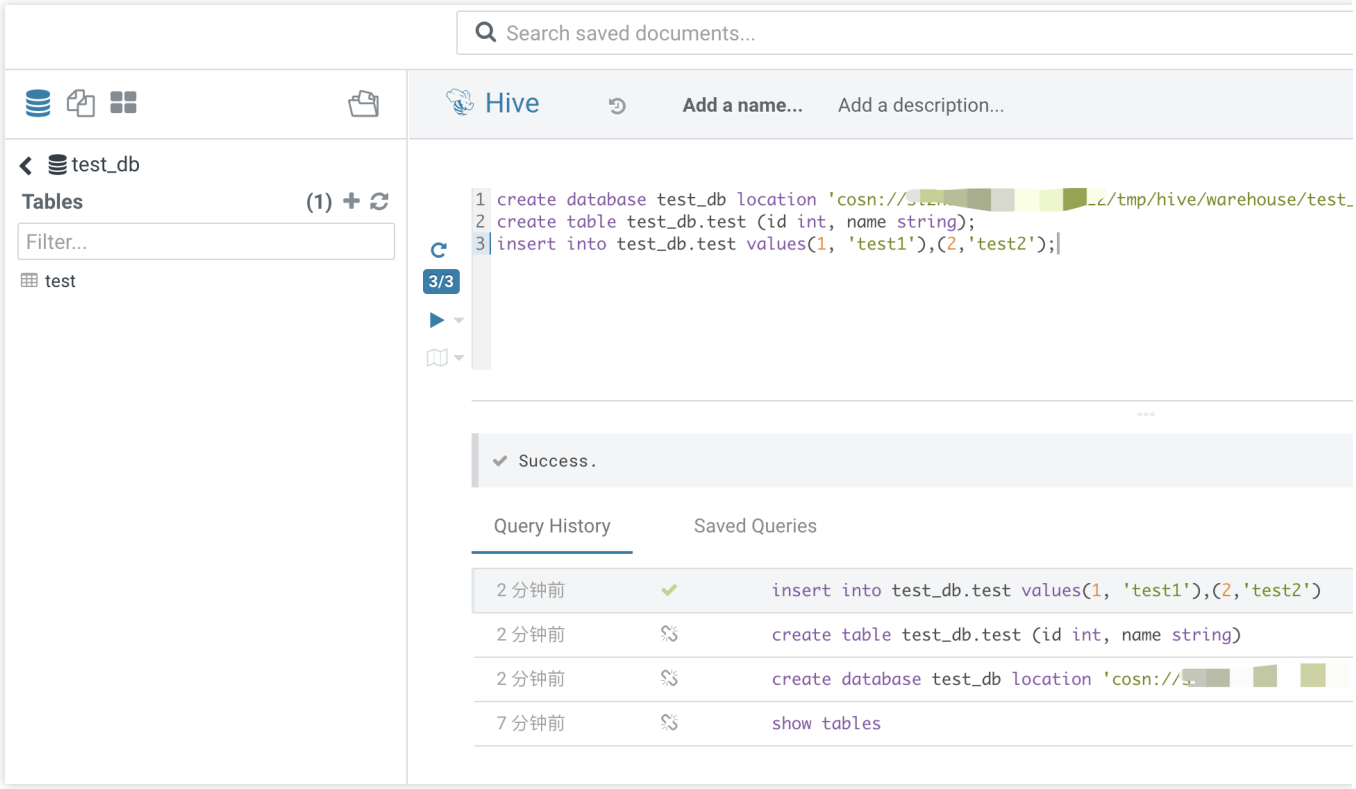
After the cluster is successfully created, you can create and submit jobs on that cluster. This document takes submitting Kyuubi Spark and Hive on Spark jobs and viewing job information as examples. The operations are as follows.

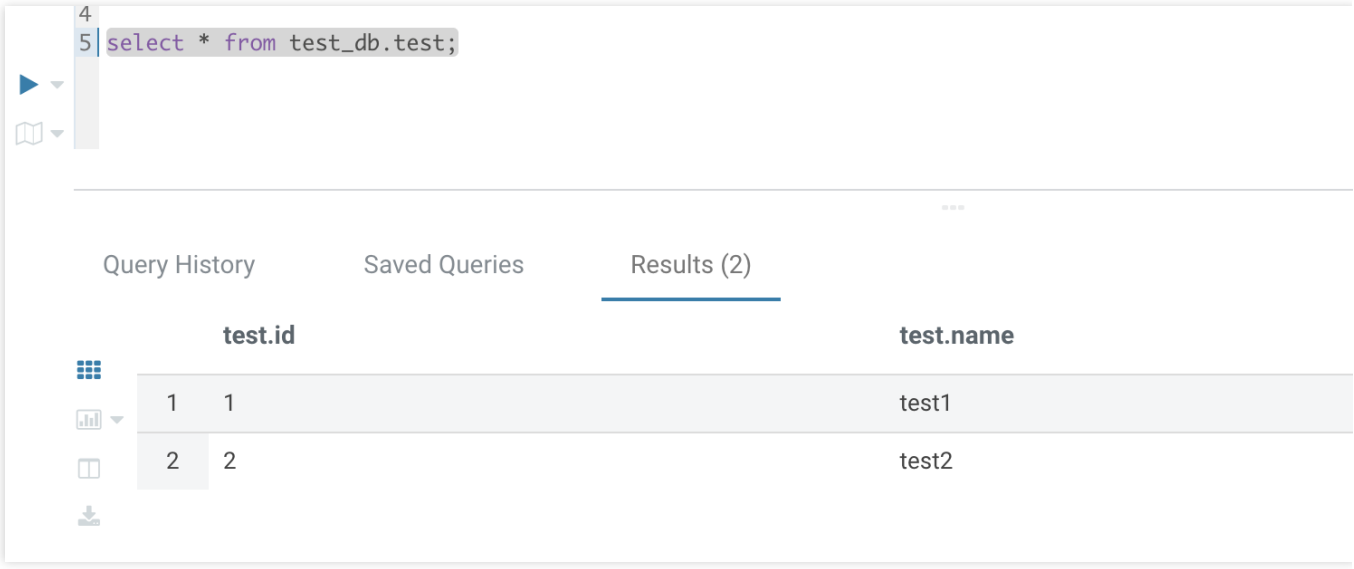
Hue Submission

1. Click the corresponding **Cluster ID/Name** in the cluster list to enter the cluster details page.
2. In the cluster details page, click **Cluster Services** and select Hue.
3. In the role management page, open the **More** dropdown in the action column, click **Enable Network Access**, then select **Public Network LB** and click **Confirm Enable**. Once the process is completed, the public network LB for the pod where hue is located will be successfully created.
4. Click **View Info/View WebUI** in the upper right corner to view the access address for Hue, and click **Access Hue WebUI**.
5. Authenticate to enter the Hue page. Typically, the authentication user is root, and the password is the one set during cluster creation.
6. Use the Hive tab to submit a Hive on Spark task.

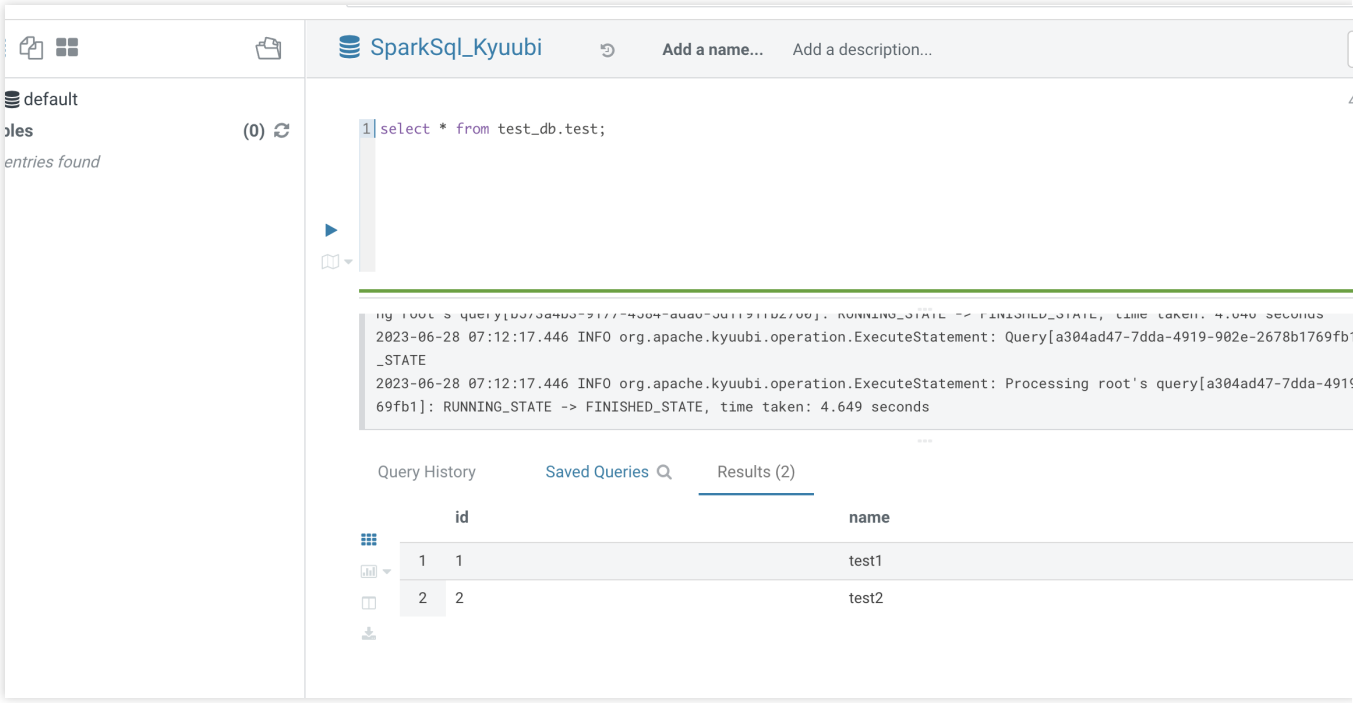
7. Use SparkSql_Kyuubi to submit a SparkSQL task.

Hive on Spark table creation and queries:





Kyuubi queries:



JDBC Submission for Hive Spark

1. If you need to connect to HiveServer using a public IP address, go to **Cluster Services > Hive > HiveServer2 > Operations > More > Enable Network Access**, and enable public network access for HiveServer2.
2. If using a public network connection, you need to check the security group in **Cluster Information**, then go to **CVM > Security Groups** and edit the security group to allow client IP access to port 7001. If using a private network connection, you can skip steps 1 and 2.

Using Maven to Write JDBC Code

First, add the following dependencies required for JDBC in the pom.xml file:

```
<dependency>
      <groupId>org.apache.hive</groupId>
      <artifactId>hive-jdbc</artifactId>
      <version>2.3.7</version>
</dependency>
<dependency>
      <groupId>org.apache.hadoop</groupId>
      <artifactId>hadoop-common</artifactId>
      <version>2.8.5</version>
</dependency>
```

Add the following packaging and compilation plugins:

```
<build>
<plugins>
```

```
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-compiler-plugin</artifactId>
    <configuration>
      <source>1.8</source>
      <target>1.8</target>
      <encoding>utf-8</encoding>
    </configuration>
  </plugin>
  <plugin>
    <artifactId>maven-assembly-plugin</artifactId>
    <configuration>
      <descriptorRefs>
      <descriptorRef>jar-with-dependencies</descriptorRef>
      </descriptorRefs>
    </configuration>
    <executions>
      <execution>
        <id>make-assembly</id>
        <phase>package</phase>
        <goals>
          <goal>single</goal>
        </goals>
      </execution>
    </executions>
  </plugin>
</plugins>
</build>
```

Create a file named HiveJdbcTest.java as follows:

```
package org.apache.hive;
import java.sql.*;


/**
 * Created by tencent on 2023/6/20.
 */
public class HiveJdbcTest {
  private static String driverName =
          "org.apache.hive.jdbc.HiveDriver";
  public static void main(String[] args)
          throws SQLException {
    try {
      Class.forName(driverName);
    } catch (ClassNotFoundException e) {
      e.printStackTrace();
```

```
      System.exit(1);
    }
    Connection con = DriverManager.getConnection(
            "jdbc:hive2://$hs2host:7001/test_db", "hadoop", "");
    Statement stmt = con.createStatement();
    String tableName = "test_jdbc";
    stmt.execute("drop table if exists " + tableName);
    stmt.execute("create table " + tableName +
            " (key int, value string)");
    System.out.println("Create table success!");
    // show tables
    String sql = "show tables '" + tableName + "'";
    System.out.println("Running: " + sql);
    ResultSet res = stmt.executeQuery(sql);
    if (res.next()) {
      System.out.println(res.getString(1));
    }
    // describe table
    sql = "describe " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(res.getString(1) + "\\t" + res.getString(2));
    }
    sql = "insert into " + tableName + " values (42,\\"hello\\"),(48,\\"world\\")";
    stmt.execute(sql);
    sql = "select * from " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(String.valueOf(res.getInt(1)) + "\\t"
              + res.getString(2));
    }
    sql = "select count(1) from " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(res.getString(1));
    }
  }
}
```

Replace $hs2host in the code with your HiveServer2 address.This program will create a test_jdbc table in test_db, insert two records, and query to output the data. Run the following command to package the entire project:

```
mvn package
```

Uploading JAR and Running

Upload the JAR packaged by using the above command to a machine that can access the HiveServer2 service or to your local machine (if it is local, ensure it can access HiveServer2 properly), and run it using the following command:

```
java -classpath ${package}-jar-with-dependencies.jar org.apache.hive.HiveJdbcTest
```

Package is your custom artifactId-version. The results are as follows:

```
Create table success!
Running: show tables 'test_jdbc'
test_jdbc
Running: describe test_jdbc
key     int
value   string

Running: select * from test_jdbc
42      hello
48      world
Running: select count(1) from test_jdbc
2
```

JDBC Submission for Hive Spark

1. If you need to connect to HiveServer using a public IP address, go to **Cluster Services > Kyuubi > KyuubiServer > Operations > More > Enable Network Access**, and enable public network access for HiveServer2.
2. If using a public network connection, you need to check the security group in **Cluster Information**, then go to **CVM > Security Groups** and edit the security group to allow client IP access to port 10009. If using a private network connection, you can skip steps 1 and 2.

Using Maven to Write JDBC Code

The JDBC dependencies and packaging plugin configurations are the same as in JDBC Submission for Hive Spark. Create KyuubiJdbcTest.java with the following content:

```
package org.apache.hive;
import java.sql.*;
package org.apache.hive;
import java.sql.*;


/**
 * Created by tencent on 2023/6/20.
 */
public class KyuubiJdbcTest {
```

```
  private static String driverName =
          "org.apache.hive.jdbc.HiveDriver";
  public static void main(String[] args)
          throws SQLException {
    try {
      Class.forName(driverName);
    } catch (ClassNotFoundException e) {
      e.printStackTrace();
      System.exit(1);
    }
    Connection con = DriverManager.getConnection(
            "jdbc:hive2://$kyuubihost:10009/test_db", "hadoop", "");
    Statement stmt = con.createStatement();
    String tableName = "test_kyuubi";
    stmt.execute("drop table if exists " + tableName);
    stmt.execute("create table " + tableName +
            " (key int, value string)");
    System.out.println("Create table success!");
    // show tables
    String sql = "show tables '" + tableName + "'";
    System.out.println("Running: " + sql);
    ResultSet res = stmt.executeQuery(sql);
    if (res.next()) {
      System.out.println(res.getString(1));
    }
    // describe table
    sql = "describe " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(res.getString(1) + "\\t" + res.getString(2));
    }
    sql = "insert into " + tableName + " values (42,\\"hello\\"),(48,\\"world\\")";
    stmt.execute(sql);
    sql = "select * from " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(String.valueOf(res.getInt(1)) + "\\t"
              + res.getString(2));
    }
    sql = "select count(1) from " + tableName;
    System.out.println("Running: " + sql);
    res = stmt.executeQuery(sql);
    while (res.next()) {
      System.out.println(res.getString(1));
    }
```

```
    }
  }
```

Replace $kyuubihost in the code with your KyuubiServer address.This program will create a test_jdbc table in test_db, insert two records, and query to output the data. Run the following command to package the entire project:

```
mvn package
```

Uploading JAR and Running

The upload process is the same as in JDBC Submission for Hive Spark. Run KyuubiJdbcTest using the following command:

```
#### Uploading JAR and Running
The upload process is the same as in JDBC Submission for Hive Spark. Run KyuubiJdbc
java -classpath ${package}-jar-with-dependencies.jar org.apache.hive.HiveJdbcTest

Package is your custom artifactId-version. The results are as follows:
<<p243>Create table success!
Running: show tables 'test_kyuubi'
test_db
Running: describe test_kyuubi
key     int
value   string
Running: select * from test_kyuubi
42      hello
48      world
Running: select count(1) from test_kyuubi
```

Terminating Clusters

When the created cluster is no longer needed, you can terminate the cluster and return the resources. Terminating the cluster will forcibly stop all services provided by the cluster and release the resources.
On the EMR on TKE page, select **Terminate** from the More options for the target cluster. In the pop-up dialog box, click **Terminate Now**.