云数据库 HBase

快速入门

产品文档

腾讯云

文档目录

快速入门
Step1.连接和访问

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获取连接IP

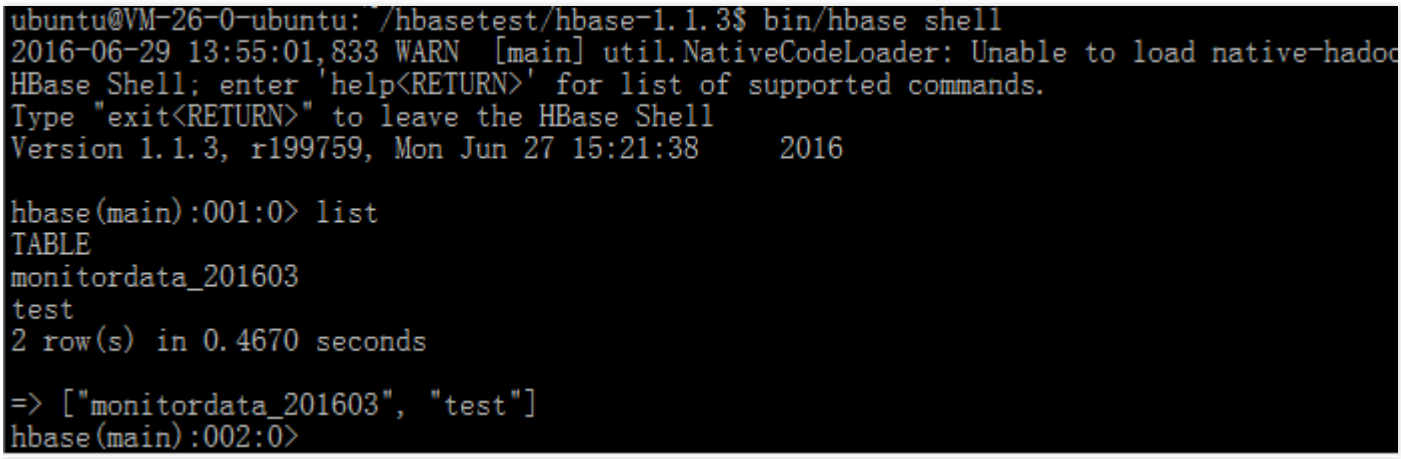
1) 获取实例ID和IP信息
进入腾讯云Hbase管理中心，可以查看实例ID，并获取连接Hbase的一个或多个IP和端口：

通过SHELL访问

首先下载Hbase客户端软件，然后解压到云主机，然后修改conf下的hbase-site.xml添加如下配置项目：

```
<configuration>
<property>
<name>hbase.zookeeper.quorum</name>
<value>(腾讯云提供的连接地址和端口，管理控制台可查)</value>
</property>
<property>
<name> chbase.tencent.enable </name>
<value> true</value>
</property>
</configuration>
```

然后执行bin/hbase shell，可以进入Hbase命令终端：



Step2.替换客户端jar包

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替换客户端jar包

连接腾讯云Hbase服务，需要使用我们提供的jar包来替换社区版本的部分jar包，并设置相应的参数

1).如您使用maven管理jar包，可参考如下pom设置来拉取和替换jar包：

```
<properties>
<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
<hadoop-two.version>2.6.4</hadoop-two.version>
</properties>

<dependencies>
<!-- 导入社区jar包 -->
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-client</artifactId>
<version>1.1.3</version>
<type>pom</type>
<scope>provided</scope>
<exclusions>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-annotations</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-auth</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-client</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-hdfs</artifactId>
```

```
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-app</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-core</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-jobclient</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-shuffle</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-api</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-client</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-server-common</artifactId>
</exclusion>
</exclusions>
</dependency>
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-server</artifactId>
<version>1.1.3</version>
<type>pom</type>
<scope>provided</scope>
```

```
<exclusions>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-annotations</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-auth</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-client</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-hdfs</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-app</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-core</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-jobclient</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-shuffle</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-api</artifactId>
</exclusion>
```

```
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-client</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-common</artifactId>
</exclusion>
<exclusion>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-server-common</artifactId>
</exclusion>
</exclusions>
</dependency>
<dependency>
<groupId>com.google.code.gson</groupId>
<artifactId>gson</artifactId>
<version>2.5</version>
</dependency>
<dependency>
<groupId>commons-configuration</groupId>
<artifactId>commons-configuration</artifactId>
<version>1.6</version>
</dependency>
<dependency>
<groupId>org.apache.httpcomponents</groupId>
<artifactId>httpcore</artifactId>
<version>4.2.4</version>
</dependency>
<dependency>
<groupId>org.apache.httpcomponents</groupId>
<artifactId>httpclient</artifactId>
<version>4.2.5</version>
</dependency>
<dependency>
<groupId>org.htrace</groupId>
<artifactId>htrace-core</artifactId>
<version>3.0.4</version>
</dependency>
<dependency>
<groupId>org.apache.avro</groupId>
<artifactId>avro</artifactId>
<version>1.7.4</version>
</dependency>
<!-- 导入腾讯云提供的jar包，注意修改jar包路径 -->
```

```
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-annotations</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-annotations-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-auth</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-auth-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-client</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-client-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-common</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-common-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-hdfs</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-hdfs-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-app</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-mapreduce-client-app-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-common</artifactId>
```

```
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-mapreduce-client-common-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-core</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-mapreduce-client-core-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-jobclient</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-mapreduce-client-jobclient-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-mapreduce-client-shuffle</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-mapreduce-client-shuffle-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-api</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-yarn-api-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-client</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-yarn-client-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-common</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-yarn-common-2.6.4.jar</systemPath>
```

```
</dependency>
<dependency>
<groupId>org.apache.hadoop</groupId>
<artifactId>hadoop-yarn-server-common</artifactId>
<version>2.6.4</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hadoop-yarn-server-common-2.6.4.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-client</artifactId>
<version>1.1.3</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hbase-client-1.1.3.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-common</artifactId>
<version>1.1.3</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hbase-common-1.1.3.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-protocol</artifactId>
<version>1.1.3</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hbase-protocol-1.1.3.jar</systemPath>
</dependency>
<dependency>
<groupId>org.apache.hbase</groupId>
<artifactId>hbase-server</artifactId>
<version>1.1.3</version>
<scope>system</scope>
<systemPath>${basedir}/hadoop/hbase-server-1.1.3.jar</systemPath>
</dependency>

</dependencies>
```

需要替换的jar包下载

需要替换的jar包清单：

hadoop-annotations-2.5.1.jar

hadoop-auth-2.5.1.jar

hadoop-client-2.5.1.jar

hadoop-common-2.5.1.jar
hadoop-hdfs-2.5.1.jar
hadoop-mapreduce-client-app-2.5.1.jar
hadoop-mapreduce-client-common-2.5.1.jar
hadoop-mapreduce-client-core-2.5.1.jar
hadoop-mapreduce-client-jobclient-2.5.1.jar
hadoop-mapreduce-client-shuffle-2.5.1.jar
hadoop-yarn-api-2.5.1.jar
hadoop-yarn-client-2.5.1.jar
hadoop-yarn-common-2.5.1.jar
hadoop-yarn-server-common-2.5.1.jar
hbase-client-1.1.3.jar
hbase-common-1.1.3.jar
hbase-protocol-1.1.3.jar
hbase-server-1.1.3.jar
以上jar包替换为：
hadoop-annotations-2.6.4.jar
hadoop-auth-2.6.4.jar
hadoop-client-2.6.4.jar
hadoop-common-2.6.4.jar
hadoop-hdfs-2.6.4.jar
hadoop-mapreduce-client-app-2.6.4.jar
hadoop-mapreduce-client-common-2.6.4.jar
hadoop-mapreduce-client-core-2.6.4.jar
hadoop-mapreduce-client-jobclient-2.6.4.jar
hadoop-mapreduce-client-shuffle-2.6.4.jar
hadoop-yarn-api-2.6.4.jar
hadoop-yarn-client-2.6.4.jar
hadoop-yarn-common-2.6.4.jar
hadoop-yarn-server-common-2.6.4.jar
hbase-client-1.1.3.jar
hbase-common-1.1.3.jar
hbase-protocol-1.1.3.jar
hbase-server-1.1.3.jar

2).如不使用mvn获取依赖，您也可以在这里直接下载所有的客户端jar包

Step3.连接腾讯云参数设置

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连接腾讯云参数设置

1).连接腾讯云Hbase服务时必须设置以下参数为true（完整代码请参考示例代码），方能正常使用：
config.setBoolean("chbase.tencent.enable", true);

2).如需要使用yarn，还需要额外设置实例ID（管理页面可以查到，完整代码请参考示例代码），如：
config.set("yarn.chbase.tencent.instanceid", "chb-lpvsvdlr");

提示：
除增加以上代码，其余使用方式和社区版本Hbase一致；可以参考https://hbase.apache.org/ 的API文档；
如您未设置以上参数，也可以正常连接社区版的Hbase。

Step4.操作示例代码

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参考以下示例代码，包括常见的hbase表格创建、删除，插入、删除、读取数据等操作

```
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;
import java.util.Map;
import java.util.NavigableMap;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.hbase.Cell;
import org.apache.hadoop.hbase.CellUtil;
import org.apache.hadoop.hbase.HBaseConfiguration;
import org.apache.hadoop.hbase.HColumnDescriptor;
import org.apache.hadoop.hbase.HTableDescriptor;
import org.apache.hadoop.hbase.KeyValue;
import org.apache.hadoop.hbase.TableName;
import org.apache.hadoop.hbase.client.Admin;
import org.apache.hadoop.hbase.client.Connection;
import org.apache.hadoop.hbase.client.ConnectionFactory;
import org.apache.hadoop.hbase.client.Delete;
import org.apache.hadoop.hbase.client.Get;
import org.apache.hadoop.hbase.client.Put;
import org.apache.hadoop.hbase.client.Result;
import org.apache.hadoop.hbase.client.ResultScanner;
import org.apache.hadoop.hbase.client.Scan;
import org.apache.hadoop.hbase.client.Table;
import org.apache.hadoop.hbase.util.Bytes;

public class Connect {

public static void createTable(String tableName, String[] familys) throws IOException {
Admin admin = null;
Connection con = null;
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
```

```
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);

TableName TABLE = TableName.valueOf(tableName);
con = ConnectionFactory.createConnection(config);
admin = con.getAdmin();

if (admin.tableExists(TABLE)) {
System.out.println("table already exists!");
} else {
HTableDescriptor tableDesc = new HTableDescriptor(TABLE);
for (int i = 0; i < familys.length; i++) {
tableDesc.addFamily(new HColumnDescriptor(familys[i]));
}
admin.createTable(tableDesc);
System.out.println("create table " + tableName + " ok.");
}
}catch(IOException e){
e.printStackTrace();
}finally{
admin.close();
con.close();
}
}

public static void deleteTable(String tableName) throws IOException{
Admin admin = null;
Connection con = null;
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);

TableName TABLE = TableName.valueOf(tableName);
con = ConnectionFactory.createConnection(config);
admin = con.getAdmin();
```

```
if (!admin.tableExists(TABLE)) {
System.out.println("table not exists!");
} else {
admin.disableTable(TABLE);
admin.deleteTable(TABLE);
System.out.println("delete table " + tableName + " ok.");
}
}catch(IOException e){
e.printStackTrace();
}finally{
admin.close();
con.close();
}
}

public static void get(String tablename, String rowkey) throws IOException {
Connection con = null;
Table table = null;
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);

con = ConnectionFactory.createConnection(config);
table = con.getTable(TableName.valueOf(tablename));

Get get = new Get(rowkey.getBytes());
Result rs = table.get(get);
for (Cell cell : rs.rawCells()) {
System.out.print(new String(CellUtil.cloneRow(cell)) + " ");
System.out.print(new String(CellUtil.cloneFamily(cell)) + ":");
System.out.print(new String(CellUtil.cloneQualifier(cell)) + " ");
System.out.print(cell.getTimestamp() + " ");
System.out.println(new String(CellUtil.cloneValue(cell)));
}
}catch(IOException e){
e.printStackTrace();
```

```
}finally{
table.close();
con.close();
}
}

public static void del(String tablename, String rowkey) throws IOException {
Connection con = null;
Table table = null;
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);

con = ConnectionFactory.createConnection(config);
table = con.getTable(TableName.valueOf(tablename));
// 批量删除
List<Delete> list = new ArrayList<Delete>();
Delete del = new Delete(rowkey.getBytes());
list.add(del);
table.delete(list);
// 单个删除
// Delete del = new Delete(Bytes.toBytes(rowkey));
// table.delete(del);
System.out.println("del recored " + rowkey + " ok.");
}catch(IOException e){
e.printStackTrace();
}finally{
table.close();
con.close();
}
}

public static void put(String tablename, String rowkey, String familyname, String colname, String value) throws IOException
{
Connection con = null;
Table table = null;
```

```
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);

con = ConnectionFactory.createConnection(config);
table = con.getTable(TableName.valueOf(tablename));

byte[] ROWKEY = Bytes.toBytes(rowkey);
Put put = new Put(ROWKEY);

Cell c1 = CellUtil.createCell(ROWKEY, Bytes.toBytes(familyname), Bytes.toBytes(colname),
System.currentTimeMillis(), KeyValue.Type.Put.getCode(), Bytes.toBytes(value));
put.add(c1);
table.put(put);
System.out.println("--------------------put ok------------------");
}catch(IOException e){
e.printStackTrace();
}finally{
table.close();
con.close();
}
}

public static void scan(String tablename, String rowkey, String family) throws IOException {
Connection con = null;
Table table = null;
try{
Configuration config = HBaseConfiguration.create();
// 填写zookeeper地址，多个地址用英文逗号隔开
config.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
// 设置重试参数
config.setInt("hbase.client.retries.number", 1);
/*
* 要连接腾讯云的hbase服务必须设置此值为true；不设置该值功能和社区版相同，可以正常连接自建hbase服务
*/
config.setBoolean("chbase.tencent.enable", true);
```

```
Scan scan = new Scan();
scan.setStartRow(Bytes.toBytes(rowkey));
scan.setCaching(500);
scan.setCacheBlocks(false);

con = ConnectionFactory.createConnection(config);
table = con.getTable(TableName.valueOf(tablename));

ResultScanner ss = table.getScanner(scan);
System.out.println("---------------------------------------");
for (Result r : ss) {
NavigableMap<byte[], byte[]> map = r.getFamilyMap(Bytes.toBytes(family));
for (Map.Entry<byte[], byte[]> ent : map.entrySet()) {
String key = new String(ent.getKey());
String value = new String(ent.getValue());
System.out.println(
"find result is:" + new String(r.getRow()) + " and code is:" + key + " and value is:" + value);
}
}
System.out.println("---------------------------------------");
}catch(IOException e){
e.printStackTrace();
}finally{
table.close();
con.close();
}
}

public static void main(String[] args) throws Exception {
if (args == null || args.length < 1) {
System.out.println("please input args....");
return;
}
String op = args[0];

if (op.equals("create")) {
// 要创建的列名
String[] familys = { "fam1", "fam2", "fam3" };
createTable("test", familys);
} else if (op.equals("put")) {
put("test", "key1", "fam1", "col1", "value1");
} else if (op.equals("get")) {
get("test", "key1");
} else if (op.equals("deltable")) {
deleteTable("test");
```

```
} else if (op.equals("scan")) {
scan("test", "key1", "fam1");
} else if (op.equals("del")) {
del("test", "key1");
}
}

}
```

MapReduce示例代码

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Map类

```
import java.io.IOException;
import java.util.Map;
import java.util.NavigableMap;

import org.apache.hadoop.hbase.client.Result;
import org.apache.hadoop.hbase.io.ImmutableBytesWritable;
import org.apache.hadoop.hbase.mapreduce.TableMapper;
import org.apache.hadoop.hbase.util.Bytes;
import org.apache.hadoop.io.Text;

public class Mapper extends TableMapper<Text, Text>{
@Override
protected void map(ImmutableBytesWritable rowkey, Result columns, Context context)
throws IOException, InterruptedException{
NavigableMap<byte[], byte[]> map = columns.getFamilyMap(Bytes.toBytes("retcode"));
for (Map.Entry<byte[], byte[]> ent : map.entrySet()) {
String retcode=Bytes.toString(ent.getKey());
String value = Bytes.toString(ent.getValue());

Text retkey = new Text(retcode);
Text retvalue = new Text(value);
context.write(retkey, retvalue);
}
}
}
```

Reduce类

```
import java.io.IOException;
import org.apache.hadoop.hbase.io.ImmutableBytesWritable;
import org.apache.hadoop.hbase.mapreduce.TableReducer;
import org.apache.hadoop.io.Text;
```

```
public class Reduce extends TableReducer<Text, Text, ImmutableBytesWritable> {
@Override
protected void cleanup(Context context) throws IOException, InterruptedException {

}

@Override
protected void setup(Context context) throws IOException, InterruptedException {

super.setup(context);
}

@Override
public void reduce(Text key, Iterable<Text> values, Context context) throws IOException, Interrupted
Exception {

long size = 0;
String rowkey = key.toString();
System.out.println(rowkey);
for(Text t:values){
System.out.println(t.toString());
}
}
}
```

提交任务

```
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.hbase.client.Scan;
import org.apache.hadoop.hbase.mapreduce.TableMapReduceUtil;
import org.apache.hadoop.hbase.util.Bytes;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.lib.output.NullOutputFormat;

public class MR {

public static void main(String[] args) throws Exception{
Job job =Job.getInstance();
Configuration conf=job.getConfiguration();
// 填写zookeeper地址，多个地址用英文逗号隔开
conf.set("hbase.zookeeper.quorum", "10.66.133.178:2181");
```

```
//必填：填写腾讯云Hbase实例ID
conf.set("yarn.chbase.tencent.instanceid", "chb-lpvsvdlr");
job.setJobName("testjob");

String tableName = "monitordata_201603";
Scan scan = new Scan();
scan.setStartRow(Bytes.toBytes("0800:00_00000000"));
scan.setCaching(500);
scan.setCacheBlocks(false);
job.setJarByClass(MR.class);
job.setReducerClass(Reduce.class);
job.setOutputFormatClass(NullOutputFormat.class);
job.setNumReduceTasks(5);
//如果要使用第三方jar包，可使用该工具类上传
//job.addFileToClassPath(JobHelper.addJarToDistributedCache(GenericObjectPoolConfig.class, conf));

TableMapReduceUtil.initTableMapperJob(tableName, scan, Mapper.class, Text.class, Text.class, job);

boolean b = job.waitForCompletion(true);
if (!b) {
throw new Exception("error with job!");
}
}
```

工具类（如果需要使用第三方jar包）

```
import java.io.IOException;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.fs.FileSystem;
import org.apache.hadoop.conf.Configuration;
import java.io.File;

public class JobHelper {

public JobHelper() {

}

public static Path addJarToDistributedCache(Class classToAdd, Configuration conf) throws IOException {
```

```
// Retrieve jar file for class2Add
String jar = classToAdd.getProtectionDomain().getCodeSource().getLocation().getPath();

File jarFile = new File(jar);

// Declare new HDFS location
Path hdfsJar = new Path("/tmp/hadoop/userlib/" + jarFile.getName());

// Mount HDFS
FileSystem hdfs = FileSystem.get(conf);

// Copy (override) jar file to HDFS
hdfs.copyFromLocalFile(false, true, new Path(jar), hdfsJar);
hdfs.close();
return hdfsJar;
}
}
```

endpoint协处理器示例代码

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使用协处理，需要将jar包提供给我们，我们安装后提供hdfs地址，您可以再通过shell或者api方式（代码中有示例）安装。强烈建议开发好协处理器jar包后，经过充分测试再安装，避免安装后影响Hbase服务的正常使用。

协处理器开发步骤

1.编写proto文件（示例：RowCount.proto）；因为hbase使用google的protoc-2.5.0版本，所以最好使用相同版本编译proto文件，生成Java文件（示例：RowCountService.java）；
2.编写服务端EndPoint代码（示例：RowCountEndPoint.java）；
3.编写客户端调用Client代码（示例：RowCountClient.java）；
4.编译jar包

endpoint协处理器示例：

proto文件

```
option java_package = "com.tencent.yun.endpoint.proto";
option java_outer_classname = "RowCountService";
option java_generic_services = true;
option java_generate_equals_and_hash = true;
option optimize_for = SPEED;

message RowCountRequest{
required string family = 1;
required string column = 2;
}

message RowCountResponse {
required int64 rowCount = 1 [default = 0];
}

service RowCount {
rpc getRowCount(RowCountRequest)
returns (RowCountResponse);
}
```

服务端RowCountEndPoint类

```
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;

import org.apache.hadoop.hbase.Cell;
import org.apache.hadoop.hbase.Coprocessor;
import org.apache.hadoop.hbase.CoprocessorEnvironment;
import org.apache.hadoop.hbase.client.Scan;
import org.apache.hadoop.hbase.coprocessor.CoprocessorException;
import org.apache.hadoop.hbase.coprocessor.CoprocessorService;
import org.apache.hadoop.hbase.coprocessor.RegionCoprocessorEnvironment;
import org.apache.hadoop.hbase.protobuf.ResponseConverter;
import org.apache.hadoop.hbase.regionserver.InternalScanner;
import org.apache.hadoop.hbase.util.Bytes;

import com.google.protobuf.RpcCallback;
import com.google.protobuf.RpcController;
import com.google.protobuf.Service;
import com.tencent.yun.endpoint.proto.RowCountService;
import com.tencent.yun.endpoint.proto.RowCountService.RowCountRequest;
import com.tencent.yun.endpoint.proto.RowCountService.RowCountResponse;

public class RowCountEndPoint extends RowCountService.RowCount implements Coprocessor, C
oprocessorService {

private RegionCoprocessorEnvironment env;

public Service getService() {
return this;
}

public void start(CoprocessorEnvironment env) throws IOException {
if (env instanceof RegionCoprocessorEnvironment) {
this.env = (RegionCoprocessorEnvironment) env;
} else {
throw new CoprocessorException("Must be loaded on a table region!");
}
}

public void stop(CoprocessorEnvironment arg0) throws IOException {
// do nothing

}

@Override
```

```
public void getRowCount(RpcController controller, RowCountRequest request, RpcCallback<RowCo
untResponse> done) {
Scan scan = new Scan();
scan.addFamily(Bytes.toBytes(request.getFamily()));
scan.addColumn(Bytes.toBytes(request.getFamily()), Bytes.toBytes(request.getColumn()));
// scan.setMaxVersions(1);
InternalScanner scanner = null;
RowCountResponse response = null;

long count = 0L;
try {
List<Cell> results = new ArrayList<Cell>();
boolean hasMore = false;
scanner = env.getRegion().getScanner(scan);

do {
hasMore = scanner.next(results);
for (Cell cell : results) {
count++;
// count = count + Bytes.toLong(CellUtil.cloneValue(cell));
}
results.clear();
} while (hasMore);

response = RowCountResponse.newBuilder().setRowCount(count).build();

} catch (IOException e) {
ResponseConverter.setControllerException(controller, e);
} finally {
if (scanner != null) {
try {
scanner.close();
} catch (IOException ignored) {
}
}
}
done.run(response);
}

}
```

客户端RowCountClient类

```
import java.io.IOException;
import java.util.Map;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.hbase.Coprocessor;
import org.apache.hadoop.hbase.HBaseConfiguration;
import org.apache.hadoop.hbase.HColumnDescriptor;
import org.apache.hadoop.hbase.HTableDescriptor;
import org.apache.hadoop.hbase.TableName;
import org.apache.hadoop.hbase.client.Admin;
import org.apache.hadoop.hbase.client.Connection;
import org.apache.hadoop.hbase.client.ConnectionFactory;
import org.apache.hadoop.hbase.client.Table;
import org.apache.hadoop.hbase.client.coprocessor.Batch;
import org.apache.hadoop.hbase.ipc.BlockingRpcCallback;
import org.apache.hadoop.hbase.ipc.ServerRpcController;

import com.google.protobuf.ServiceException;
import com.tencent.yun.endpoint.proto.RowCountService.RowCount;
import com.tencent.yun.endpoint.proto.RowCountService.RowCountRequest;
import com.tencent.yun.endpoint.proto.RowCountService.RowCountResponse;
import com.tencent.yun.observer.RegionObserver;

public class RowCountClient {

public static void testRowCountEndpoint(String tableName, String family, String col) throws IOExce
ption {
System.out.println("begin test.....");
long t1 = System.currentTimeMillis();
Configuration config = HBaseConfiguration.create();
//填写hbase zk地址
config.set("hbase.zookeeper.quorum", "100.67.159.134:2181,100.67.159.141:2181,100.67.159.196:2181"
);

// 填寫family名和列名
final RowCountRequest req = RowCountRequest.newBuilder().setFamily(family).setColumn(col).build
();
RowCountResponse resp = null;
Connection con = null;
Table table = null;
try {
con = ConnectionFactory.createConnection(config);
table = con.getTable(TableName.valueOf(tableName));
```

```
Map<byte[], Long> results = table.coprocessorService(RowCount.class, null, null,
new Batch.Call<RowCount, Long>() {

public Long call(RowCount instance) throws IOException {
ServerRpcController controller = new ServerRpcController();
BlockingRpcCallback<RowCountResponse> rpccall = new BlockingRpcCallback<RowCountResponse
>();
instance.getRowCount(controller, req, rpccall);
RowCountResponse resp = rpccall.get();
//
return resp.hasRowCount() ? resp.getRowCount() : 0L;
}

});
long count = 0L;
for (Long sum : results.values()) {
System.out.println("region row Sum = " + sum);
count += sum;
}
System.out.println("total count = " + count);
long t2 = System.currentTimeMillis();
System.out.println("use time = " + (t2-t1));
} catch (IOException e) {
e.printStackTrace();
} catch (ServiceException e) {
e.printStackTrace();
} catch (Throwable e) {
e.printStackTrace();
} finally{
table.close();
con.close();
}
}

public static void delCorprocessor(String tableName) throws IOException {
System.out.println("begin delCorprocessor.....");
Connection con = null;
Admin admin = null;
try {
Configuration config = HBaseConfiguration.create();
//填写hbase zk地址
config.set("hbase.zookeeper.quorum", "100.67.159.134:2181,100.67.159.141:2181,100.67.159.196:2181"
);

TableName TABLE = TableName.valueOf(tableName);
```

```
con = ConnectionFactory.createConnection(config);
admin = con.getAdmin();

HTableDescriptor tableDesc = admin.getTableDescriptor(TABLE);

tableDesc.removeCoprocessor(RowCountEndPoint.class.getCanonicalName());
tableDesc.removeCoprocessor(RegionObserver.class.getCanonicalName());

admin.modifyTable(TABLE, tableDesc);
} catch (IOException e) {
e.printStackTrace();
}finally{
admin.close();
con.close();
}
System.out.println("end delCorprocessor.....ok");
}

/**
* 支持hbase0.96以上版本
* @throws IOException
*/
public static void setupToExistTable(String tableName) throws IOException {
System.out.println("begin setupToExistTable.....");
Connection con = null;
Admin admin = null;
try {
Configuration config = HBaseConfiguration.create();
//填写hbase zk地址
config.set("hbase.zookeeper.quorum", "100.67.159.134:2181,100.67.159.141:2181,100.67.159.196:2181"
);

TableName TABLE = TableName.valueOf(tableName);
con = ConnectionFactory.createConnection(config);
admin = con.getAdmin();

HTableDescriptor tableDesc = admin.getTableDescriptor(TABLE);

//填写我们提供的jar包的hdfs地址
Path jarPath = new Path("hdfs://100.67.159.132:8020/coprocessor/1/thbase-1.0-SNAPSHOT.jar");

tableDesc.addCoprocessor(RowCountEndPoint.class.getCanonicalName(), jarPath, Coprocessor.PRIOR
ITY_USER,
null);
```

```
tableDesc.addCoprocessor(RegionObserver.class.getCanonicalName(), jarPath, Coprocessor.PRIORITY_
USER, null);

admin.modifyTable(TABLE, tableDesc);
} catch (IOException e) {
e.printStackTrace();
}finally{
admin.close();
con.close();
}
System.out.println("end setupToExistTable.....ok");

}

public static void createAndSetup(String tableName) throws IOException {
System.out.println("begin safesetup.....");
Connection con = null;
Admin admin = null;
try {
Configuration config = HBaseConfiguration.create();
//填写hbase zk地址
config.set("hbase.zookeeper.quorum", "100.67.159.134:2181,100.67.159.141:2181,100.67.159.196:2181"
);

TableName TABLE = TableName.valueOf(tableName);

con = ConnectionFactory.createConnection(config);
admin = con.getAdmin();

HTableDescriptor tableDesc = new HTableDescriptor(TABLE);
HColumnDescriptor columnFamily1 = new HColumnDescriptor("f1");
columnFamily1.setMaxVersions(3);
tableDesc.addFamily(columnFamily1);

//填写我们提供的jar包的hdfs地址
Path jarPath = new Path("hdfs://100.67.159.132:8020/coprocessor/1/thbase-1.0-SNAPSHOT.jar");

tableDesc.addCoprocessor(RowCountEndPoint.class.getCanonicalName(), jarPath, Coprocessor.PRIOR
ITY_USER,
null);
tableDesc.addCoprocessor(RegionObserver.class.getCanonicalName(), jarPath, Coprocessor.PRIORITY_
USER, null);

admin.createTable(tableDesc);
System.out.println("end safesetup.....ok");
```

```
} catch (IOException e) {
e.printStackTrace();
}finally{
admin.close();
con.close();
}

}

public static void main(String[] args) throws IOException {
if (args == null || args.length < 2) {
System.out.println("please input args....");
return;
}
String op = args[0];
String tableName = args[1];
String family = args[2];
String col = args[3];

if (op.equals("setup")) {
setupToExistTable(tableName);
} else if (op.equals("safesetup")) {
createAndSetup(tableName);
} else if (op.equals("run")) {
testRowCountEndpoint(tableName, family, col);
} else if (op.equals("unset")) {
delCorprocessor(tableName);
}

}

}
```

observer协处理器示例

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observer协处理器示例：

```
import java.io.IOException;
import java.util.List;

import org.apache.hadoop.hbase.Cell;
import org.apache.hadoop.hbase.CellUtil;
import org.apache.hadoop.hbase.client.Get;
import org.apache.hadoop.hbase.coprocessor.BaseRegionObserver;
import org.apache.hadoop.hbase.coprocessor.ObserverContext;
import org.apache.hadoop.hbase.coprocessor.RegionCoprocessorEnvironment;
import org.apache.hadoop.hbase.util.Bytes;

public class RegionObserver extends BaseRegionObserver {
private static final byte[] ADMIN = Bytes.toBytes("admin");
private static final byte[] COLUMN_FAMILY = Bytes.toBytes("f1");
private static final byte[] COLUMN = Bytes.toBytes("col1");
private static final byte[] VALUE = Bytes.toBytes("You can not see Admin details");

@Override
public void preGetOp(ObserverContext<RegionCoprocessorEnvironment> e, Get get, List<Cell> resul
ts) throws IOException{

if (Bytes.equals(get.getRow(),ADMIN)) {
Cell c = CellUtil.createCell(get.getRow(), COLUMN_FAMILY, COLUMN, System.currentTimeMillis(), (byt
e)4, VALUE);
results.add(c);
e.bypass();
}

}
}
```

支持SQL查询

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1.phoenix配置

需要使用phoenix需要先下载我们提供的phoenix的jar包，下载后解压到CVM的任意一个目录下:

```
ubuntu@VM-203-25-ubuntu:~/test/phoenix-4.8.1-HBase-1.1$ ll
total 205264
drwxrwxr-x 7 ubuntu ubuntu      4096 Dec  1 20:46 ./
drwxrwxr-x 5 ubuntu ubuntu      4096 Dec  1 20:46 ../
drwxr-xr-x 2 ubuntu ubuntu      4096 Dec  1 20:57 bin/
-rw-r--r-- 1 ubuntu ubuntu      1930 Sep 23 08:57 build.txt
drwxr-xr-x 3 ubuntu ubuntu      4096 Oct 19 14:33 dev/
drwxr-xr-x 2 ubuntu ubuntu      4096 Oct 19 14:33 docs/
drwxr-xr-x 3 ubuntu ubuntu      4096 Oct 19 14:33 examples/
drwxrwxr-x 2 ubuntu ubuntu      4096 Dec  1 20:46 lib/
-rw-r--r-- 1 ubuntu ubuntu 88906712 Oct 19 16:59 phoenix-4.8.1-HBase-1.1-client.jar
-rw-r--r-- 1 ubuntu ubuntu 62567971 Oct 19 16:58 phoenix-4.8.1-HBase-1.1-hive.jar
-rw-r--r-- 1 ubuntu ubuntu  6620780 Oct 19 16:58 phoenix-4.8.1-HBase-1.1-queryserver.jar
-rw-r--r-- 1 ubuntu ubuntu 24749543 Oct 19 16:59 phoenix-4.8.1-HBase-1.1-server.jar
-rw-r--r-- 1 ubuntu ubuntu 27070375 Oct 19 16:58 phoenix-4.8.1-HBase-1.1-thin-client.jar
ubuntu@VM-203-25-ubuntu:~/test/phoenix-4.8.1-HBase-1.1$
```

然后进入bin目录下，在配置文件hbase-site.xml中添加如下配置

```
<property>
<name>hbase.zookeeper.quorum</name>
<value>(腾讯云提供的连接地址和端口，管理控制台可查)</value>
</property>
<property>
<name> chbase.tencent.enable </name>
<value> true</value>
</property>
```

2.测试phoenix的可用性

在bin目录下可以使用shell来测试phoenix的可用性，./sqlline.py

```
ubuntu@VM-203-25-ubuntu:~/test/phoenix-4.8.1-HBase-1.1/bin$ ./sqlline.py
Setting property: [incremental, false]
Setting property: [isolation, TRANSACTION_READ_COMMITTED]
issuing: !connect jdbc:phoenix: none none org.apache.phoenix.jdbc.PhoenixDriver
Connecting to jdbc:phoenix:
16/12/02 10:06:26 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Connected to: Phoenix (version 4.8)
Driver: PhoenixEmbeddedDriver (version 4.8)
Autocommit status: true
Transaction isolation: TRANSACTION_READ_COMMITTED
Building list of tables and columns for tab-completion (set fastconnect to true to skip)...
86/86 (100%) Done
Done
sqlline version 1.1.9
0: jdbc:phoenix:>
```

再输入!tables

```
0: jdbc:phoenix:> !tables
+------------+--------------+-------------+---------------+----------+------------+----------------------------+-----------------+--------------+
| TABLE_CAT  | TABLE_SCHEM  | TABLE_NAME  |  TABLE_TYPE   | REMARKS  | TYPE_NAME  | SELF_REFERENCING_COL_NAME  | REF_GENERATION  | INDEX_STATE  |
+------------+--------------+-------------+---------------+----------+------------+----------------------------+-----------------+--------------+
|            | SYSTEM       | CATALOG     | SYSTEM TABLE  |          |            |                            |                 |              |
|            | SYSTEM       | FUNCTION    | SYSTEM TABLE  |          |            |                            |                 |              |
|            | SYSTEM       | SEQUENCE    | SYSTEM TABLE  |          |            |                            |                 |              |
|            | SYSTEM       | STATS       | SYSTEM TABLE  |          |            |                            |                 |              |
+------------+--------------+-------------+---------------+----------+------------+----------------------------+-----------------+--------------+
```

3.基本SQL语句的使用

```
0: jdbc:phoenix:10.66.181.136:2181> CREATE TABLE stats.prod_metrics ( host char(50) not null, created_date date not null,
. . . . . . . . . . . . . . . . . >      txn_count bigint CONSTRAINT pk PRIMARY KEY (host, created_date) );
No rows affected (1.343 seconds)
```

```
0: jdbc:phoenix:10.66.181.136:2181> UPSERT INTO stats.prod_metrics (host,created_date,txn_count) VALUES('192.168.0.1',TO_DATE('2016-12-02 10:00:0
0'),1);
1 row affected (0.284 seconds)
0: jdbc:phoenix:10.66.181.136:2181> SELECT * FROM stats.prod_metrics;
+--------------+--------------------------+------------+
|     HOST     |       CREATED_DATE       | TXN_COUNT  |
+--------------+--------------------------+------------+
| 192.168.0.1  | 2016-12-02 10:00:00.000  | 1          |
+--------------+--------------------------+------------+
```

```
0: jdbc:phoenix:10.66.181.136:2181> ALTER TABLE stats.prod_metrics ADD tip varchar(200);
No rows affected (6.003 seconds)
0: jdbc:phoenix:10.66.181.136:2181> UPSERT INTO stats.prod_metrics VALUES('192.168.1.1:2100',TO_DATE('2016-10-10 12:00:00'),1,'SOME OK');
1 row affected (0.031 seconds)
0: jdbc:phoenix:10.66.181.136:2181> SELECT * FROM stats.prod_metrics;
+-------------------+--------------------------+------------+----------+
|       HOST        |       CREATED_DATE       | TXN_COUNT  |   TIP    |
+-------------------+--------------------------+------------+----------+
| 192.168.0.1       | 2016-12-02 10:00:00.000  | 1          |          |
| 192.168.1.1:2100  | 2016-10-10 12:00:00.000  | 1          | SOME OK  |
+-------------------+--------------------------+------------+----------+
2 rows selected (0.077 seconds)
```

```
0: jdbc:phoenix:10.66.181.136:2181> UPSERT INTO stats.prod_metrics VALUES('192.168.0.1',TO_DATE('2016-10-10 12:00:00'),1,'SOME OK');
1 row affected (0.01 seconds)
0: jdbc:phoenix:10.66.181.136:2181> UPSERT INTO stats.prod_metrics VALUES('192.168.1.1:2100',TO_DATE('2016-10-10 12:00:00'),2,'SOME OK');
1 row affected (0.015 seconds)
0: jdbc:phoenix:10.66.181.136:2181> SELECT * FROM stats.prod_metrics;
+-------------------+--------------------------+------------+----------+
|       HOST        |       CREATED_DATE       | TXN_COUNT  |   TIP    |
+-------------------+--------------------------+------------+----------+
| 192.168.0.1       | 2016-10-10 12:00:00.000  | 1          | SOME OK  |
| 192.168.0.1       | 2016-12-02 10:00:00.000  | 1          |          |
| 192.168.1.1:2100  | 2016-10-10 12:00:00.000  | 2          | SOME OK  |
+-------------------+--------------------------+------------+----------+
```

更多的范例详见phoenix官网http://phoenix.apache.org/language/index.html

各语言支持

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支持多语言访问

若需要通过多语言的方式访问HBase，需要开启shtrift 服务。通过如下方式，进入HBase目录（连接和访问里有下载地址，并需要配置云参数），然后通过如下方式启动

```
bin/hbase-daemon.sh start thrift -p <port> --infoport <infoport>
```