

运行Hbase作业出现cannot access its superclass com.google.protobuf.LiteralByteString异常解决

最近写了一个Spark程序用来读取Hbase中的数据，我的Spark版本是1.6.1，Hbase版本是0.96.2-hadoop2，当程序写完之后，使用下面命令提交作业：

```
[iteblog@www.iteblog.com $] bin/spark-submit --master yarn-cluster --executor-memory 4g --num-executors 5 --queue iteblog --executor-cores 2 --class com.iteblog.hbase.HBaseRead --jars spark-hbase-connector_2.10-1.0.3.jar,hbase-common-0.96.2-hadoop2.jar,hbase-server-0.96.2-hadoop2.jar,hbase-client-0.96.2-hadoop2.jar,hbase-protocol-0.96.2-hadoop2.jar,htrace-core-2.04.jar,guava-15.0.jar spark-iteblog-1.0-SNAPSHOT.jar
```

结果作业运行的时候出现了以下异常

```
16/11/03 09:45:05 ERROR ApplicationMaster: User class threw exception: org.apache.hadoop.hbase.DoNotRetryIOException: java.lang.IllegalAccessError: class com.google.protobuf.HBaseZeroCopyByteString cannot access its superclass com.google.protobuf.LiteralByteString
org.apache.hadoop.hbase.DoNotRetryIOException: java.lang.IllegalAccessError: class com.google.protobuf.HBaseZeroCopyByteString cannot access its superclass com.google.protobuf.LiteralByteString
    at org.apache.hadoop.hbase.client.RpcRetryingCaller.translateException(RpcRetryingCaller.java:215)
    at org.apache.hadoop.hbase.client.RpcRetryingCaller.callWithRetries(RpcRetryingCaller.java:127)
    at org.apache.hadoop.hbase.client.RpcRetryingCaller.callWithRetries(RpcRetryingCaller.java:96)
    at org.apache.hadoop.hbase.client.ClientScanner.nextScanner(ClientScanner.java:264)
    at org.apache.hadoop.hbase.client.ClientScanner.initializeScannerInConstruction(ClientScanner.java:169)
    at org.apache.hadoop.hbase.client.ClientScanner.<init>(ClientScanner.java:164)
    at org.apache.hadoop.hbase.client.ClientScanner.<init>(ClientScanner.java:107)
    at org.apache.hadoop.hbase.client.HTable.getScanner(HTable.java:720)
    at org.apache.hadoop.hbase.client.MetaScanner.metaScan(MetaScanner.java:174)
    at org.apache.hadoop.hbase.client.MetaScanner.metaScan(MetaScanner.java:82)
    at org.apache.hadoop.hbase.client.HConnectionManager$HConnectionImplementation.isTableAvailable(HConnectionManager.java:911)
    at org.apache.hadoop.hbase.client.HBaseAdmin.isTableAvailable(HBaseAdmin.java:1074)
    at org.apache.hadoop.hbase.client.HBaseAdmin.isTableAvailable(HBaseAdmin.java:1082)
    at com.iteblog.hbase.HBaseRead$.main(HBaseRead.scala:29)
    at com.iteblog.hbase.HBaseRead.main(HBaseRead.scala)
```

```
at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:57)
at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
)
at java.lang.reflect.Method.invoke(Method.java:606)
at org.apache.spark.deploy.yarn.ApplicationMaster$$anon$2.run(ApplicationMaster.scala:542)
Caused by: java.lang.IllegalAccessError: class com.google.protobuf.HBaseZeroCopyByteString
cannot access its superclass com.google.protobuf.LiteralByteString
at java.lang.ClassLoader.defineClass1(Native Method)
at java.lang.ClassLoader.defineClass(ClassLoader.java:800)
at java.security.SecureClassLoader.defineClass(SecureClassLoader.java:142)
at java.net.URLClassLoader.defineClass(URLClassLoader.java:449)
at java.net.URLClassLoader.access$100(URLClassLoader.java:71)
at java.net.URLClassLoader$1.run(URLClassLoader.java:361)
at java.net.URLClassLoader$1.run(URLClassLoader.java:355)
at java.security.AccessController.doPrivileged(Native Method)
at java.net.URLClassLoader.findClass(URLClassLoader.java:354)
at java.lang.ClassLoader.loadClass(ClassLoader.java:425)
at java.lang.ClassLoader.loadClass(ClassLoader.java:358)
at org.apache.hadoop.hbase.protobuf.RequestConverter.buildRegionSpecifier(RequestConverter.java:910)
at org.apache.hadoop.hbase.protobuf.RequestConverter.buildScanRequest(RequestConverter.java:420)
at org.apache.hadoop.hbase.client.ScannerCallable.openScanner(ScannerCallable.java:297)
at org.apache.hadoop.hbase.client.ScannerCallable.call(ScannerCallable.java:157)
at org.apache.hadoop.hbase.client.ScannerCallable.call(ScannerCallable.java:57)
at org.apache.hadoop.hbase.client.RpcRetryingCaller.callWithRetries(RpcRetryingCaller.java:120)
... 18 more
```

Google了一下发现这是由于Hbase的Bug导致的（可以参见<https://issues.apache.org/jira/browse/HBASE-10304>），这个问题的发生是由于优化了 HBASE-9867 引起的，无意间引进了一个依赖类加载器。它影响使用 -libjars 参数和使用 fat jar两种模式的job，官方对这个Bug的描述：

This is caused by an optimization introduced in HBASE-9867 that inadvertently introduced a classloader dependency.This affects both jobs using the -libjars option and "fat jar," those which package their runtime dependencies in a nested lib folder.

这个Bug影响了 0.96.1 到 0.98.4版本的HBase。对于这个问题的解决，我们可以在运行作业的时候加入比较新的 hbase-protocol jar包到环境变量里面。具体来说如下：

Spark作业解决

如果你是Spark作业，可以通过下面的方法解决上面的问题：

```
[iteblog@www.iteblog.com ~]$ bin/spark-submit --master yarn-cluster --executor-memory 4g -  
-num-executors 5 --queue iteblog --executor-cores 2 --class com.iteblog.hbase.HBaseRead --j  
ars spark-hbase-connector_2.10-1.0.3.jar,hbase-common-0.98.6-hadoop2.jar,hbase-server-0.9  
8.6-hadoop2.jar,hbase-client-0.98.6-hadoop2.jar,hbase-protocol-0.98.6-hadoop2.jar,htrace-cor  
e-2.04.jar,guava-15.0.jar --conf "spark.driver.extraClassPath=/home/iteblog/hbase-protocol-0.9  
8.6-hadoop2.jar" --conf "spark.executor.extraClassPath=/home/iteblog/hbase-  
protocol-0.98.6-hadoop2.jar" spark-iteblog-1.0-SNAPSHOT.jar
```

上面通过 `spark.driver.extraClassPath` 和 `spark.executor.extraClassPath` 分别在Spark作业的Driver和Executuor端的环境变量里面引入了 `hbase-protocol-0.98.6-hadoop2.jar` 包。注意，需要把所有hbase-xxx的jar包都换成0.98.x以后的，否则还是会有上述异常问题。当然，如果你觉得上面比较麻烦，你可以把上面的 `--conf` 配置写入到 `$SPARK_HOME/conf/spark-defaults.conf` 文件里面，这样就不需要再在提交作业的时候加上了。

Mapreduce作业解决

如果你是在Mapreduce作业中遇到上面的异常，可以通过设置 `HADOOP_CLASSPATH` 环境变量解决上面的问题，如下：

```
[iteblog@www.iteblog.com ~]$ export HADOOP_CLASSPATH="/home/iteblog/hbase-  
protocol-0.98.6-hadoop2.jar"  
[iteblog@www.iteblog.com ~]$ bin/hadoop --config /home/stack/conf_hadoop/ jar /home/itebl  
og/hbase-  
protocol-0.98.6-hadoop2.jar org.apache.hadoop.hbase.mapreduce.RowCounter hbaseTable
```

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