# 尚硅谷大数据技术之 Griffin

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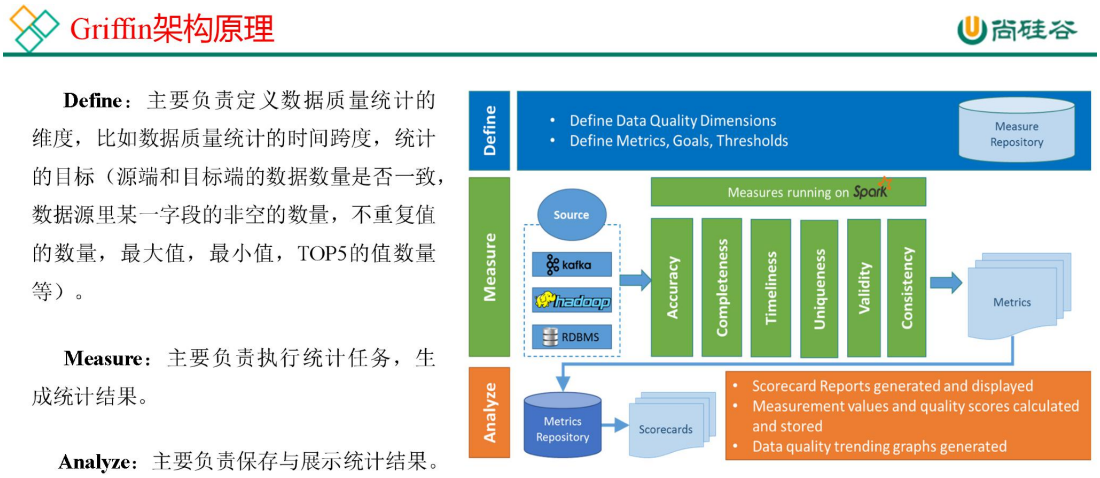
版本：V2.0

# 第 1 章 Griffin 入门

## 1.1 Griffin 概述

Apache Griffin 是一个开源的大数据数据质量解决方案，它支持批处理和流模式两种数据质量检测方式，可以从不同维度度量数据资产，从而提升数据的准确度和可信度。例如：离线任务执行完毕后检查源端和目标端的数据数量是否一致，源表的数据空值等。

## 1.2 Griffin 架构原理






# 第 2 章 Griffin 安装及使用

## 2.1 安装前环境准备

### 2.1.1 安装 ES5.2

1）上传 elasticsearch-5.2.2.tar.gz 到 hadoop102 的/opt/software 目录，并解压到/opt/module 目录

```
[atguigu@hadoop102 software]$ tar -zxvf elasticsearch-5.2.2.tar.gz -C /opt/module/
```

2）修改/opt/module/elasticsearch-5.2.2/config/elasticsearch.yml 配置文件

```
[atguigu@hadoop102 config]$ vim elasticsearch.yml

network.host: hadoop102
http.port: 9200
http.cors.enabled: true
http.cors.allow-origin: "*"
bootstrap.memory_lock: false
bootstrap.system_call_filter: false
```

3）修改 Linux 系统配置文件/etc/security/limits.conf

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ sudo vim
/etc/security/limits.conf

#添加如下内容
* soft nproc 65536
* hard nproc 65536
* soft nofile 65536
* hard nofile 65536
```

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ sudo vim
/etc/sysctl.conf

#添加
vm.max_map_count=655360
```

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ sudo vim
/etc/security/limits.d/90-nproc.conf
#修改配置
*          soft    nproc     2048
```

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ sudo sysctl -p
```

4）需要重新启动虚拟机

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ su root
root@hadoop102 elasticsearch-5.2.2]# reboot
```

5）在/opt/module/elasticsearch-5.2.2 路径上，启动 ES

```
[atguigu@hadoop102 elasticsearch-5.2.2]$ bin/elasticsearch
```

6）在 ES 里创建 griffin 索引

```
[atguigu@hadoop102 ~]$ curl -XPUT http://hadoop102:9200/griffin
-d '
{
    "aliases": {},
    "mappings": {
        "accuracy": {
            "properties": {
                "name": {
                    "fields": {
                        "keyword": {
                            "ignore_above": 256,
                            "type": "keyword"
                        }
                    },
```

```
                "type": "text"
            },
            "tmst": {
                "type": "date"
            }
        }
    }
  },
  "settings": {
    "index": {
        "number_of_replicas": "2",
        "number_of_shards": "5"
    }
  }
}
'
```

### 2.1.2 安装 JDK8、Hadoop2.7.2

注意：JDK 版本至少 1.8 及以上，Hadoop 版本至少 2.6.0 及以上

1）安装 Hadoop 集群

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2）启动 Hadoop 集群

```
[atguigu@hadoop102 hadoop-2.7.2]$ sbin/start-dfs.sh
[atguigu@hadoop103 hadoop-2.7.2]$ sbin/start-yarn.sh
```

### 2.1.3 安装 Hive2.3

注意：Hive 版本至少 2.2 及以上

1）上传 apache-hive-2.3.0-bin.tar.gz 到/opt/software 目录下，并解压到/opt/module

```
[atguigu@hadoop102 software]$ tar -zxvf
apache-hive-2.3.6-bin.tar.gz -C /opt/module/
```

2）修改 apache-hive-2.3.6-bin 名称为 hive-2.3.6

```
[atguigu@hadoop102 module]$ mv apache-hive-2.3.6-bin hive-2.3.6
```

3）将 Mysql 的 mysql-connector-java-5.1.27-bin.jar 拷贝到/opt/module/hive-2.3.6/lib/

```
[atguigu@hadoop102 module]$ cp
/opt/software/mysql-libs/mysql-connector-java-5.1.27/mysql-con
nector-java-5.1.27-bin.jar /opt/module/hive-2.3.6/lib/
```

4）在/opt/module/hive-2.3.6/conf 路径上，创建 hive-site.xml 文件

```
[atguigu@hadoop102 conf]$ vim hive-site.xml

#添加如下内容
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="configuration.xsl"?>
```

```
<configuration>
    <property>
       <name>javax.jdo.option.ConnectionURL</name>

<value>jdbc:mysql://hadoop102:3306/metastore?createDatabaseIfNotExist=tru
e</value>
       <description>JDBC connect string for a JDBC metastore</description>
    </property>

    <property>
       <name>javax.jdo.option.ConnectionDriverName</name>
       <value>com.mysql.jdbc.Driver</value>
       <description>Driver class name for a JDBC metastore</description>
    </property>

    <property>
       <name>javax.jdo.option.ConnectionUserName</name>
       <value>root</value>
                <description>username    to    use    against    metastore
database</description>
    </property>

    <property>
       <name>javax.jdo.option.ConnectionPassword</name>
       <value>000000</value>
                <description>password    to    use    against    metastore
database</description>
    </property>

   <property>
       <name>hive.metastore.warehouse.dir</name>
       <value>/user/hive/warehouse</value>
       <description>location    of    default    database    for    the
warehouse</description>
   </property>

   <property>
      <name>hive.cli.print.header</name>
      <value>true</value>
   </property>

   <property>
      <name>hive.cli.print.current.db</name>
      <value>true</value>
   </property>

   <property>
      <name>hive.metastore.schema.verification</name>
      <value>false</value>
   </property>

   <property>
      <name>datanucleus.schema.autoCreateAll</name>
      <value>true</value>
   </property>

   <property>
      <name>hive.metastore.uris</name>
      <value>thrift://hadoop102:9083</value>
   </property>
</configuration>
```

3）启动服务

```
[atguigu@hadoop102 hive-2.3.6]$ nohup bin/hive --service metastore &
[atguigu@hadoop102 hive-2.3.6]$ nohup bin/hive --service hiveserver2 &
```

注意：hive2.x 版本需要启动两个服务 metastore 和 hiveserver2，否则会报错 Exception in thread "main" java.lang.RuntimeException: org.apache.hadoop.hive.ql.metadata.HiveException: java.lang.RuntimeException: Unable to instantiate org.apache.hadoop.hive.ql.metadata.SessionHiveMetaStoreClient

4）服务启动完毕后在启动 Hive

```
[atguigu@hadoop102 hive-2.3.6]$ bin/hive
```

### 2.1.4 安装 Spark2.4.3

注意：Spark 版本至少 2.2.1 及以上

1）把 spark-2.4.3-bin-hadoop2.7.tgz 上传到/opt/software 目录，并解压到/opt/module

```
[atguigu@hadoop102 software]$ tar -zxvf spark-2.4.3-bin-hadoop2.7.tgz -C /opt/module/
```

2）修改名称/opt/module/spark-2.4.3-bin-hadoop2.7 名称为 spark

```
[atguigu@hadoop102 module]$ mv spark-2.4.3-bin-hadoop2.7/ spark
```

3）修改/opt/module/spark/conf/spark-defaults.conf.template 名称为 spark-defaults.conf

```
[atguigu@hadoop102 conf]$ mv spark-defaults.conf.template spark-defaults.conf
```

4）在 hadoop 集群上提前创建 spark_directory 日志路径

```
[atguigu@hadoop102 spark]$ hadoop fs -mkdir /spark_directory
```

5）在 spark-default.conf 文件中配置 Spark 日志路径

```
[atguigu@hadoop102 conf]$ vim spark-defaults.conf

#添加如下配置
spark.eventLog.enabled          true
spark.eventLog.dir
hdfs://hadoop102:9000/spark_directory
```

6）修改/opt/module/spark/conf/spark-env.sh.template 名称为 spark-env.sh

```
[atguigu@hadoop102 conf]$ mv spark-env.sh.template spark-env.sh
```

7）在/opt/module/spark/conf/spark-env.sh 文件中配置 YARN 配置文件路径、配置历史服务器相关参数

```
[atguigu@hadoop102 conf]$ vim spark-env.sh

#添加如下参数
YARN_CONF_DIR=/opt/module/hadoop-2.7.2/etc/hadoop
export SPARK_HISTORY_OPTS="-Dspark.history.ui.port=18080
-Dspark.history.retainedApplications=30
-Dspark.history.fs.logDirectory=hdfs://hadoop102:9000/spark_directory"
```

8）把 Hive 中 /opt/module/hive-2.3.6/lib/datanucleus-*.jar 包拷贝到 Spark 的 /opt/module/spark/jars 路径

```
[atguigu@hadoop102 lib]$ cp /opt/module/hive-2.3.6/lib/datanucleus-*.jar /opt/module/spark/jars/
```

9）把 Hive 中 /opt/module/hive-2.3.6/conf/hive-site.xml 包拷贝到 Spark 的 /opt/module/spark/conf 路径

```
[atguigu@hadoop102 conf]$ cp /opt/module/hive-2.3.6/conf/hive-site.xml /opt/module/spark/conf/
```

10）测试环境

```
[atguigu@hadoop102 spark]$ bin/spark-shell

scala>spark.sql("show databases").show
```

## 2.1.5 安装 Livy0.3

1）上传 livy-server-0.3.0.zip 到 hadoop102 的/opt/software 目录下，并解压到/opt/module

```
[atguigu@hadoop102 software]$ unzip livy-server-0.3.0.zip -d /opt/module/
```

2）修改/opt/module/livy-server-0.3.0 文件名称为 livy

```
[atguigu@hadoop102 module]$ mv livy-server-0.3.0/ livy
```

3）修改/opt/module/livy/conf/livy.conf 文件，配置 livy 与 spark 相关参数

```
livy.server.host = Hadoop102
livy.spark.master =yarn
livy.spark.deployMode = client
livy.repl.enableHiveContext = true
livy.server.port = 8998
```

4）配置需要的环境变量

```
[atguigu@hadoop102 conf]$ sudo vim /etc/profile

#SPARK_HOME
export SPARK_HOME=/opt/module/spark
export PATH=$PATH:$SPARK_HOME/bin

[atguigu@hadoop102 conf]$ source /etc/profile
```

5）在/opt/module/livy/路径上，启动 livy 服务

```
[atguigu@hadoop102 livy]$ bin/livy-server start
```

## 2.1.6 安装 MySQL5.6

1）上传 Init_quartz_mysql_innodb.sql 到 hadoop102 的/opt/software 目录

2）使用 mysql 创建 quartz 库，执行脚本初始化表信息

```
[atguigu@hadoop102 ~]$ mysql -uroot -p000000
mysql> create database quartz;
mysql> use quartz;
mysql> source /opt/software/Init_quartz_mysql_innodb.sql
mysql> show tables;
```

### 2.1.7 安装 Maven

1）Maven 下载：https://maven.apache.org/download.cgi

2）把 apache-maven-3.6.1-bin.tar.gz 上传到 linux 的/opt/software 目录下

3）解压 apache-maven-3.6.1-bin.tar.gz 到/opt/module/目录下面

```
[atguigu@hadoop102 software]$ tar -zxvf apache-maven-3.6.1-bin.tar.gz -C /opt/module/
```

4）修改 apache-maven-3.6.1 的名称为 maven

```
[atguigu@hadoop102 module]$ mv apache-maven-3.6.1/ maven
```

5）添加环境变量到/etc/profile 中

```
[atguigu@hadoop102 module]$ sudo vim /etc/profile
#MAVEN_HOME
export MAVEN_HOME=/opt/module/maven
export PATH=$PATH:$MAVEN_HOME/bin
```

6）测试安装结果

```
[atguigu@hadoop102 module]$ source /etc/profile
[atguigu@hadoop102 module]$ mvn -v
```

7）修改 setting.xml，指定为阿里云

```
[atguigu@hadoop102 maven]$ cd conf
[atguigu@hadoop102 maven]$ vim settings.xml

<!-- 添加阿里云镜像-->
  <mirror>
     <id>nexus-aliyun</id>
     <mirrorOf>central</mirrorOf>
     <name>Nexus aliyun</name>
  <url>http://maven.aliyun.com/nexus/content/groups/public</ur
  l>
  </mirror>
  <mirror>
     <id>UK</id>
     <name>UK Central</name>
     <url>http://uk.maven.org/maven2</url>
     <mirrorOf>central</mirrorOf>
  </mirror>
  <mirror>
     <id>repo1</id>
     <mirrorOf>central</mirrorOf>
     <name>Human Readable Name for this Mirror.</name>
     <url>http://repo1.maven.org/maven2/</url>
  </mirror>
  <mirror>
     <id>repo2</id>
     <mirrorOf>central</mirrorOf>
     <name>Human Readable Name for this Mirror.</name>
     <url>http://repo2.maven.org/maven2/</url>
  </mirror>
```

8）在/home/atguigu 目录下创建.m2 文件夹

```
[atguigu@hadoop102 ~]$ mkdir .m2
```

## 2.2 编译 Griffin0.4.0

### 2.2.1 修改配置文件:

1）上传 griffin-master.zip 到 hadoop102 的/opt/software 目录，并解压 tar.gz 包到/opt/module

```
[atguigu@hadoop102 software]$ unzip griffin-master.zip -d /opt/module/
```

2）修改/opt/module/griffin-master/service/pom.xml 文件，注释掉 org.postgresql，添加 mysql 依赖。

```
[atguigu@hadoop102 service]$ vim pom.xml

<!--
<dependency>
    <groupId>org.postgresql</groupId>
    <artifactId>postgresql</artifactId>
    <version>${postgresql.version}</version>
</dependency>
-->
<dependency>
    <groupId>mysql</groupId>
    <artifactId>mysql-connector-java</artifactId>
</dependency>
注意:版本号删除掉
```

3）修改/opt/module/griffin-master/service/src/main/resources/application.properties 文件

```
[atguigu@hadoop102 service]$ vim /opt/module/griffin-master/service/src/main/resources/application.properties

# Apache Griffin 应用名称
spring.application.name=griffin_service
# MySQL 数据库配置信息
spring.datasource.url=jdbc:mysql://hadoop102:3306/quartz?autoReconnect=true&useSSL=false
spring.datasource.username=root
spring.datasource.password=000000
spring.jpa.generate-ddl=true
spring.datasource.driver-class-name=com.mysql.jdbc.Driver
spring.jpa.show-sql=true
# Hive metastore 配置信息
hive.metastore.uris=thrift://hadoop102:9083
hive.metastore.dbname=default
hive.hmshandler.retry.attempts=15
hive.hmshandler.retry.interval=2000ms
# Hive cache time
cache.evict.hive.fixedRate.in.milliseconds=900000
# Kafka schema registry 按需配置
kafka.schema.registry.url=http://hadoop102:8081
# Update job instance state at regular intervals
jobInstance.fixedDelay.in.milliseconds=60000
# Expired time of job instance which is 7 days that is 604800000 milliseconds.Time unit only supports milliseconds
jobInstance.expired.milliseconds=604800000
```

```
# schedule predicate job every 5 minutes and repeat 12 times at
most
#interval time unit s:second m:minute h:hour d:day,only support
these four units
predicate.job.interval=5m
predicate.job.repeat.count=12
# external properties directory location
external.config.location=
# external BATCH or STREAMING env
external.env.location=
# login strategy ("default" or "ldap")
login.strategy=default
# ldap
ldap.url=ldap://hostname:port
ldap.email=@example.com
ldap.searchBase=DC=org,DC=example
ldap.searchPattern=(sAMAccountName={0})
# hdfs default name
fs.defaultFS=
# elasticsearch
elasticsearch.host=hadoop102
elasticsearch.port=9200
elasticsearch.scheme=http
# elasticsearch.user = user
# elasticsearch.password = password
# livy
livy.uri=http://hadoop102:8998/batches
# yarn url
yarn.uri=http://hadoop103:8088
# griffin event listener
internal.event.listeners=GriffinJobEventHook
```

4）修改/opt/module/griffin-master/service/src/main/resources/sparkProperties.json 文件

```
[atguigu@hadoop102                service]$                vim
/opt/module/griffin-master/service/src/main/resources/sparkPro
perties.json

{
  "file": "hdfs://hadoop102:9000/griffin/griffin-measure.jar",
  "className": "org.apache.griffin.measure.Application",
  "name": "griffin",
  "queue": "default",
  "numExecutors": 2,
  "executorCores": 1,
  "driverMemory": "1g",
  "executorMemory": "1g",
  "conf": {
    "spark.yarn.dist.files":
"hdfs://hadoop102:9000/home/spark_conf/hive-site.xml"
  },
  "files": [
  ]
}
```

5）修改/opt/module/griffin-master/service/src/main/resources/env/env_batch.json 文件

```
[atguigu@hadoop102                service]$                vim
/opt/module/griffin-master/service/src/main/resources/env/env_
batch.json
```

```
{
  "spark": {
    "log.level": "INFO"
  },
  "sinks": [
    {
      "type": "CONSOLE",
      "config": {
        "max.log.lines": 10
      }
    },
    {
      "type": "HDFS",
      "config": {
        "path": "hdfs://hadoop102:9000/griffin/persist",
        "max.persist.lines": 10000,
        "max.lines.per.file": 10000
      }
    },
    {
      "type": "ELASTICSEARCH",
      "config": {
        "method": "post",
        "api": "http://hadoop102:9200/griffin/accuracy",
        "connection.timeout": "1m",
        "retry": 10
      }
    }
  ],
  "griffin.checkpoint": []
}
```

6）修改/opt/module/griffin-master/service/src/main/resources/env/env_streaming.json 文件

```
[atguigu@hadoop102 service]$ vim /opt/module/griffin-master/service/src/main/resources/env/env_streaming.json

{
  "spark": {
    "log.level": "WARN",
    "checkpoint.dir": "hdfs:///griffin/checkpoint/${JOB_NAME}",
    "init.clear": true,
    "batch.interval": "1m",
    "process.interval": "5m",
    "config": {
      "spark.default.parallelism": 4,
      "spark.task.maxFailures": 5,
      "spark.streaming.kafkaMaxRatePerPartition": 1000,
      "spark.streaming.concurrentJobs": 4,
      "spark.yarn.maxAppAttempts": 5,
      "spark.yarn.am.attemptFailuresValidityInterval": "1h",
      "spark.yarn.max.executor.failures": 120,
      "spark.yarn.executor.failuresValidityInterval": "1h",
      "spark.hadoop.fs.hdfs.impl.disable.cache": true
    }
  },
  "sinks": [
```

```
    {
      "type": "CONSOLE",
      "config": {
        "max.log.lines": 100
      }
    },
    {
      "type": "HDFS",
      "config": {
        "path": "hdfs://hadoop102:9000/griffin/persist",
        "max.persist.lines": 10000,
        "max.lines.per.file": 10000
      }
    },
    {
      "type": "ELASTICSEARCH",
      "config": {
        "method": "post",
        "api": "http://hadoop102:9200/griffin/accuracy"
      }
    }
  ],
  "griffin.checkpoint": [
    {
      "type": "zk",
      "config": {
        "hosts": "zk:2181",
        "namespace": "griffin/infocache",
        "lock.path": "lock",
        "mode": "persist",
        "init.clear": true,
        "close.clear": false
      }
    }
  ]
}
```

7）修改/opt/module/griffin-master/service/src/main/resources/quartz.properties 文件

```
[atguigu@hadoop102 service]$ vim
/opt/module/griffin-master/service/src/main/resources/quartz.p
roperties

org.quartz.scheduler.instanceName=spring-boot-quartz
org.quartz.scheduler.instanceId=AUTO
org.quartz.threadPool.threadCount=5
org.quartz.jobStore.class=org.quartz.impl.jdbcjobstore.JobStor
eTX
# If you use postgresql as your database,set this property value
to org.quartz.impl.jdbcjobstore.PostgreSQLDelegate
# If you use mysql as your database,set this property value to
org.quartz.impl.jdbcjobstore.StdJDBCDelegate
# If you use h2 as your database, it's ok to set this property value
to StdJDBCDelegate, PostgreSQLDelegate or others
org.quartz.jobStore.driverDelegateClass=org.quartz.impl.jdbcjo
bstore.StdJDBCDelegate
org.quartz.jobStore.useProperties=true
org.quartz.jobStore.misfireThreshold=60000
org.quartz.jobStore.tablePrefix=QRTZ_
```

```
org.quartz.jobStore.isClustered=true
org.quartz.jobStore.clusterCheckinInterval=20000
```

### 2.2.2 执行编译

1）在/opt/module/griffin-master 路径执行 maven 命令，开始编译 Griffin 源码

```
[atguigu@hadoop102 griffin-master]$ mvn -Dmaven.test.skip=true
clean install
```

2）见到如下页面，表示编译成功。（大约需要 1 个小时左右）

```
[INFO] ------------------------------------------------------------------------
[INFO] Reactor Summary for Apache Griffin 0.6.0-SNAPSHOT 0.6.0-SNAPSHOT:
[INFO]
[INFO] Apache Griffin 0.6.0-SNAPSHOT ..................... SUCCESS [01:15 min]
[INFO] Apache Griffin :: UI :: Default UI ................. SUCCESS [57:27 min]
[INFO] Apache Griffin :: Web Service ...................... SUCCESS [09:03 min]
[INFO] Apache Griffin :: Measures ......................... SUCCESS [05:07 min]
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  01:13 h
[INFO] Finished at: 2019-09-19T15:58:48+08:00
[INFO] ------------------------------------------------------------------------
[atguigu@hadoop102 griffin-master]$
```

### 2.2.3 修改名称并上传 HDFS

命令执行完成后，会在 Service 和 Measure 模块的 target 目录下分别看到 service-0.6.0.jar 和 measure-0.6.0.jar 两个 jar 包。

1）修改/opt/module/griffin-master/measure/target/measure-0.6.0-SNAPSHOT.jar 名称

```
[atguigu@hadoop102 measure]$ mv measure-0.6.0-SNAPSHOT.jar
griffin-measure.jar
```

2）上传 griffin-measure.jar 到 HDFS 文件目录里

```
[atguigu@hadoop102 measure]$ hadoop fs -mkdir /griffin/
[atguigu@hadoop102 measure]$ hadoop fs -put griffin-measure.jar
/griffin/
```

注意：这样做的目的主要是因为 Spark 在 YARN 集群上执行任务时，需要到 HDFS 的/griffin 目录下加载 griffin-measure.jar，避免发生类 org.apache.griffin.measure.Application 找不到的错误。

3）上传 hive-site.xml 文件到 HDFS 的/home/spark_conf/路径

```
[atguigu@hadoop102 ~]$ hadoop fs -mkdir -p /home/spark_conf/
[atguigu@hadoop102 ~]$ hadoop fs -put
/opt/module/hive-2.3.6/conf/hive-site.xml /home/spark_conf/
```

4）进入到/opt/module/griffin-master/service/target/路径，运行 service-0.6.0-SNAPSHOT.jar

控制台启动：控制台打印信息

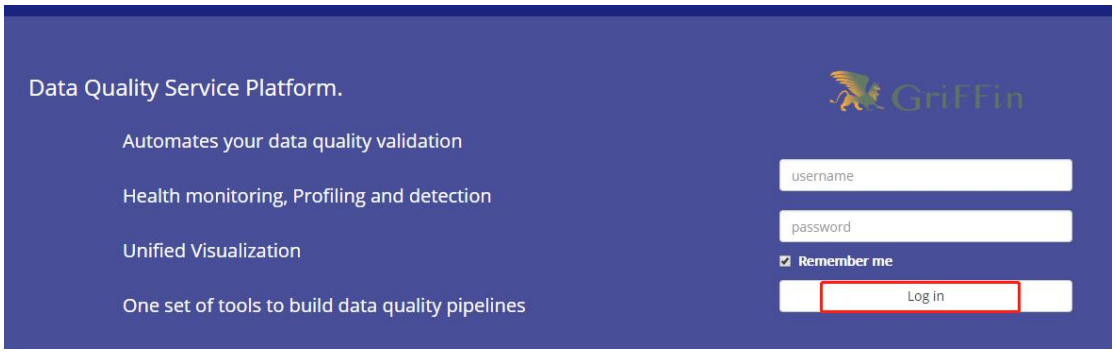
```
[atguigu@hadoop102 target]$ java -jar service-0.6.0-SNAPSHOT.jar
```

后台启动：启动后台并把日志归写倒 service.out

```
[atguigu@hadoop102 ~]$ nohup java -jar
service-0.6.0-SNAPSHOT.jar>service.out 2>&1 &
```

### 2.2.4 浏览器访问

http://hadoop102:8080 默认账户和密码都是无




# 第 3 章 案例实操

## 3.1 生产测试数据

获取官网测试数据。在/opt/module/目录下创建 data 文件夹，并下载相关测试数据

```
[atguigu@hadoop102 moudle]$ mkdir data
[atguigu@hadoop102 data]$
wget http://griffin.apache.org/data/batch/gen_demo_data.sh
wget http://griffin.apache.org/data/batch/gen_delta_src.sh
wget http://griffin.apache.org/data/batch/demo_basic
wget http://griffin.apache.org/data/batch/delta_tgt
wget
http://griffin.apache.org/data/batch/insert-data.hql.template
wget http://griffin.apache.org/data/batch/gen-hive-data.sh
wget http://griffin.apache.org/data/batch/create-table.hql
wget http://griffin.apache.org/data/batch/delta_src
wget http://griffin.apache.org/data/batch/delta_tgt

[atguigu@hadoop102 data]$ chmod 777 ../data -R
#生成临时文件
[atguigu@hadoop102 data]$ ./gen_demo_data.sh
#生产测试数据
[atguigu@hadoop102 data]$ ./gen-hive-data.sh
```

## 3.2 UI 创建 Measure

注意根据官网描述，目前 UI 创建 Measure 只支持 Accuracy 的 Measure，UI 界面上虽然有其他选项但是无法运行 job。

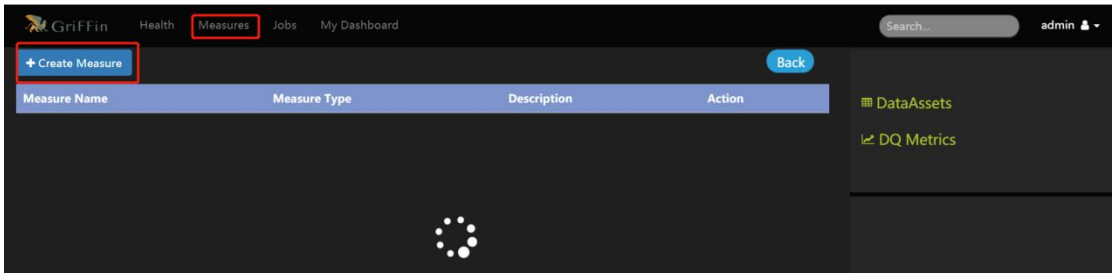
By clicking "Measures", and then choose "Create Measure". You can use the measure to process data and get the result you want.


There are mainly four kinds of measures for you to choose, which are:

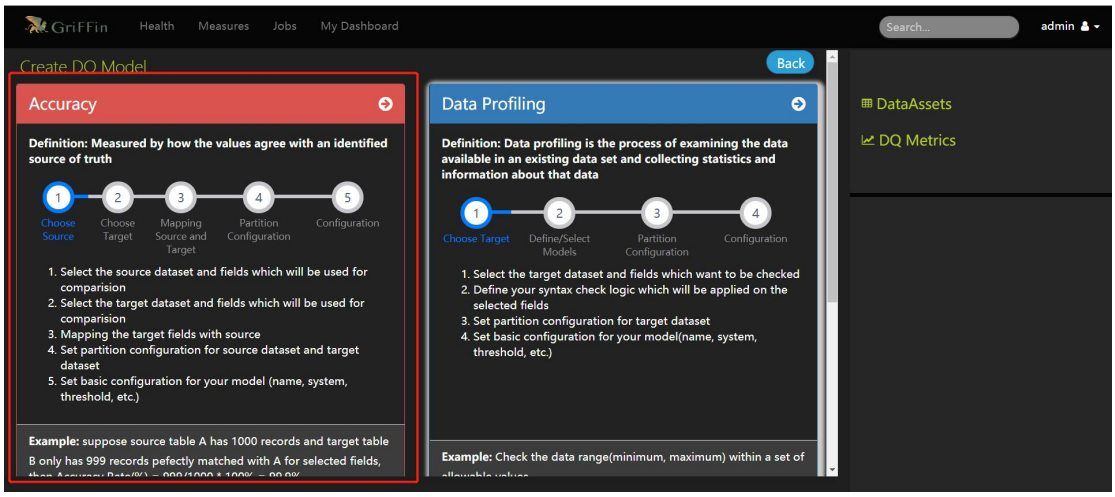
1. if you want to measure the match rate between source and target, choose accuracy.
2. if you want to check the specific value of the data(such as: null column count), choose profiling.

At current we only support accuracy measure creation from UI.

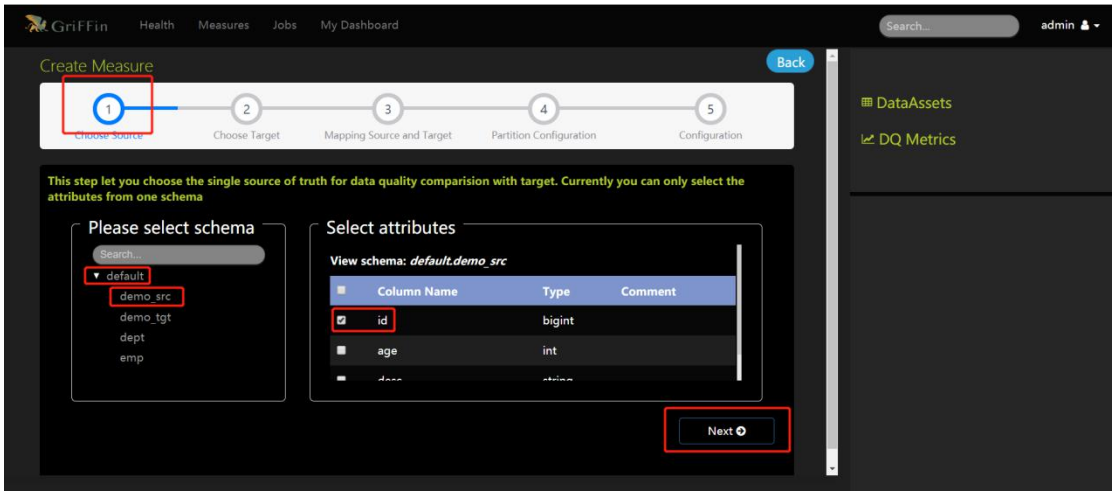
### 3.2.1 添加一个新的 Measure



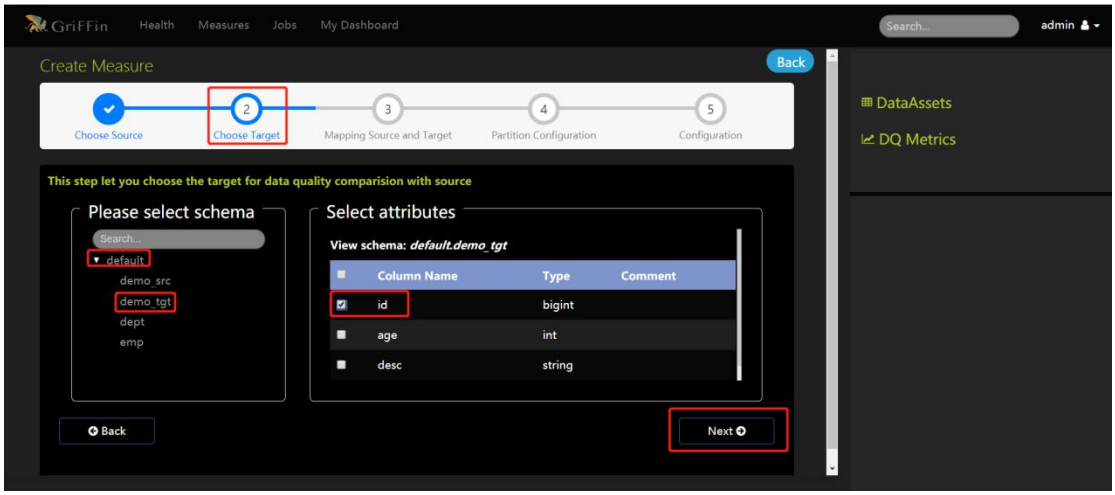

### 3.2.2 选择准确度 Accuracy



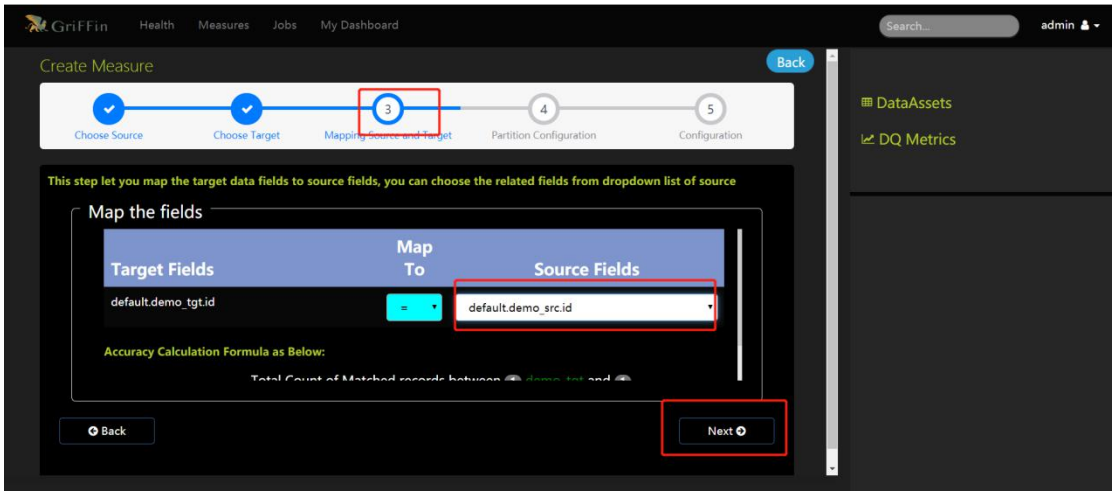
### 3.2.3 选择数据源的字段



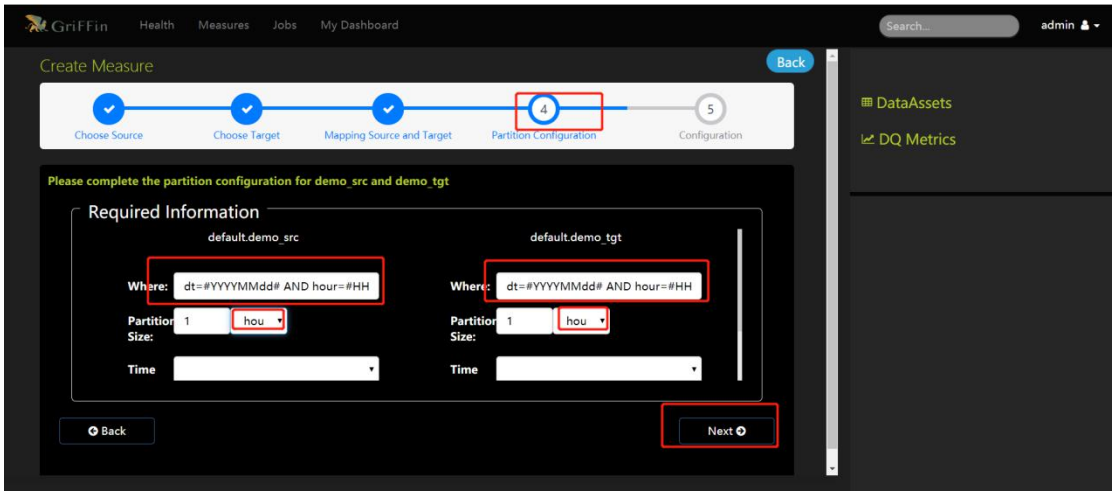

### 3.2.4 选择目标表的字段



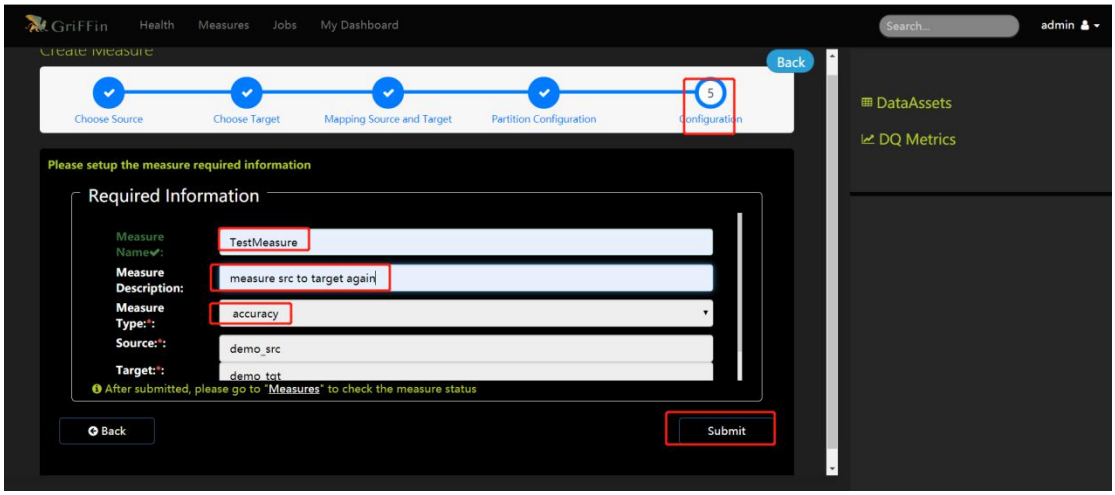

### 3.2.5 选择条件



### 3.2.6 选择时间格式和分区尺度



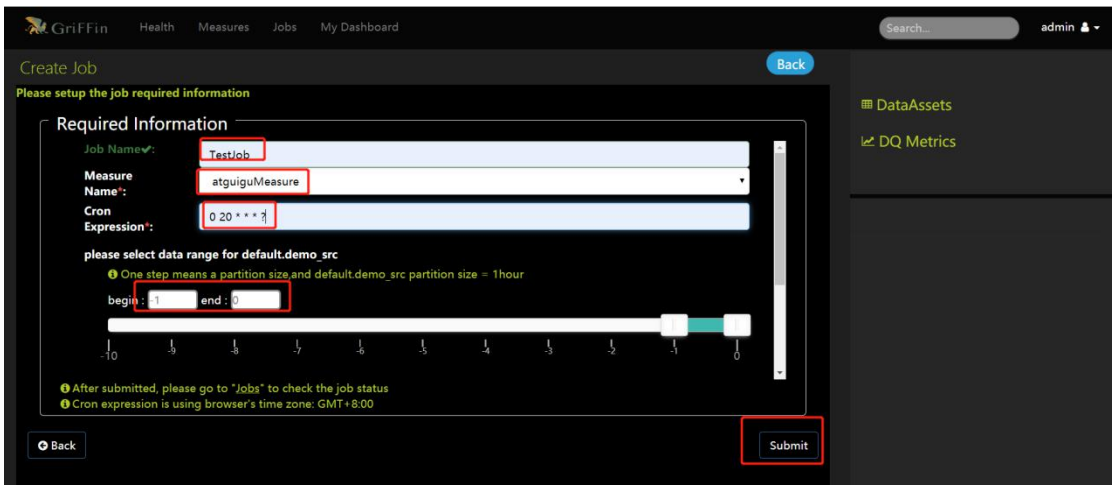

### 3.2.7 添加 Measure 名称和描述




## 3.3 UI 创建 Job

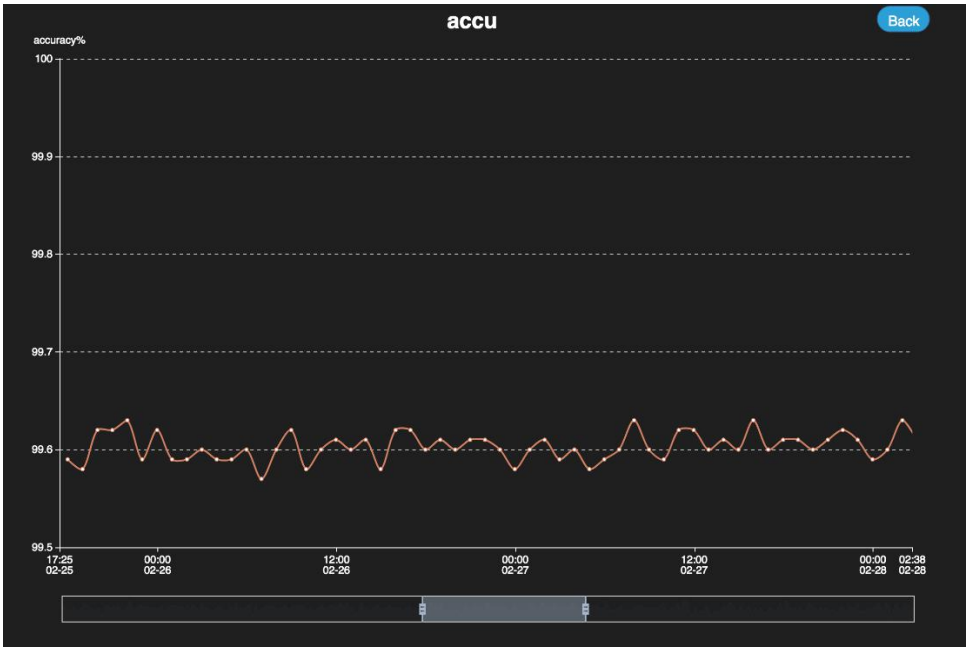
### 3.3.1 新建一个 Job

### 3.3.2 与 Measure 结合并调度任务执行




### 3.3.3 查看运行结果单击“DQ 指标”


单击放大图片




## 3.4 手动定制规则运行 Job

### 3.4.1 准确度度量 Accuracy Measure

1）创建 json 文件制定相应规则

在/opt/module/griffin-master/measure/target 目录下创建文件 dq.json

vim dq.json

```
{
  "name": "batch_accu",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.3",
          "config": {
            "database": "gmall",
            "table.name": "dwd_order_info"
          }
        }
      ]
    }, {
      "name": "tgt",
      "connectors": [
        {

          "type": "hive",
          "version": "2.3",
          "config": {
            "database": "gmall",
```

```
          "table.name": "dws_user_action"
        }
      }
    ]
  }
 ],
 "evaluate.rule": {
  "rules": [
    {
      "dsl.type": "griffin-dsl",
      "dq.type": "accuracy",
      "out.dataframe.name": "accu",
      "rule": "src.id = tgt.user_id ",
      "details": {
        "source": "src",
        "target": "tgt",
        "miss": "miss_count",
        "total": "total_count",
        "matched": "matched_count"
      },
      "out": [
        {
          "type": "metric",
          "name": "accu"
        },
        {
          "type": "record",
          "name": "missRecords"
        }
      ]
    }
  ]
 },
 "sinks": ["CONSOLE", "HDFS"]
}
```

选项："rule": "src.id = tgt.id AND src.age = tgt.age AND src.desc = tgt.desc"

rule 制定匹配规则如 src 表的 id 字段对应 tgt 表 id 字段

当前规则是 id age desc 三者字段相同，这个规则就是接下来对应 job 所需监控的对应关系

2）在/opt/module/griffin-master/measure/target 目录下创建文件 env.json

vim env.json

```
{
 "spark": {
  "log.level": "WARN"
 },
 "sinks": [
  {
    "type": "console"
  },
  {
    "type": "hdfs",
    "config": {
      "path": "hdfs://hadoop102:9000/griffin/persist"
    }
  },
  {
    "type": "elasticsearch",
    "config": {
```

```
        "method": "post",
        "api": "http://hadoop102:9200/griffin/accuracy"
      }
    }
  ]
}
```

分别指定 hdfs 结果存储路径和 elasticsearch 路径

两个 json 文件编写完毕后 指定 /opt/module/griffin-0.4.0/measure/target 该路径下的 griffin-measure.jar 运行 Spark 任务

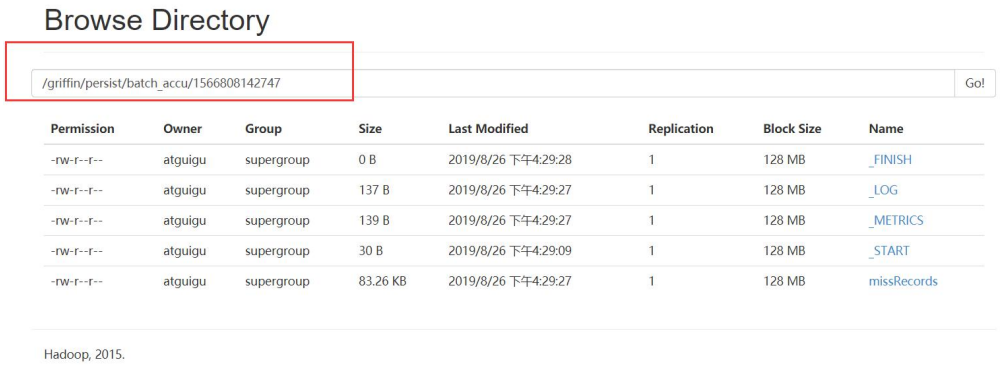
（3）Spark 提交脚本命令

```
[atguigu@hadoop102 target]$ spark-submit --class org.apache.griffin.measure.Application --master yarn --deploy-mode client --driver-memory 1g --executor-memory 1g --num-executors 1 griffin-measure.jar env.json dq.json
```

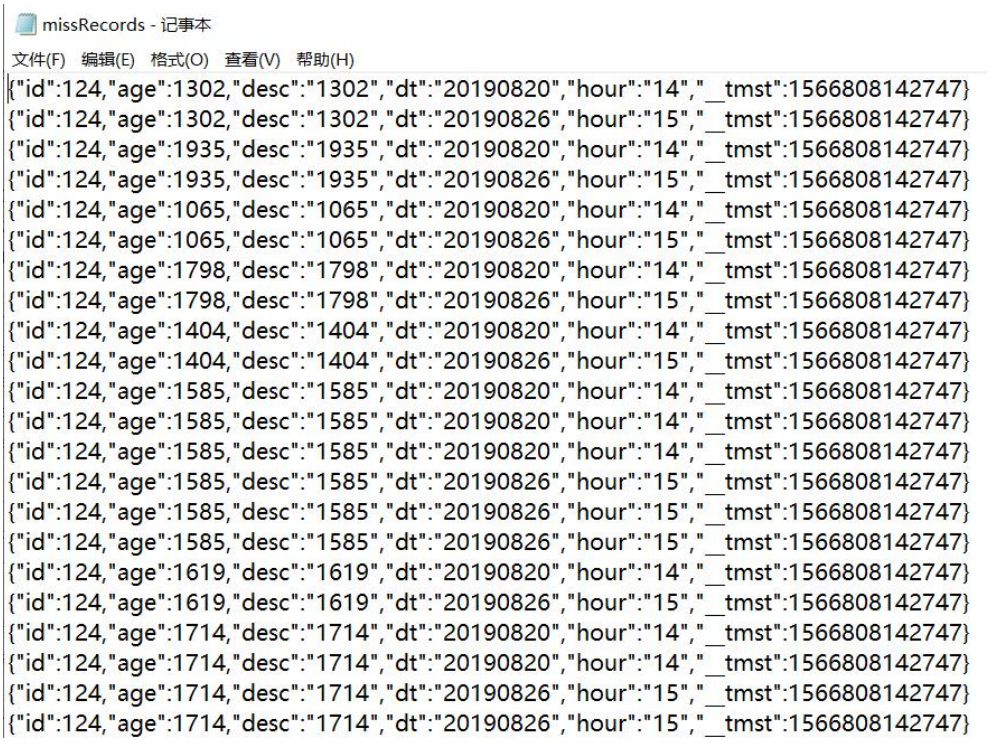
```
[1566808142747] batch_accu start: application_1566800981025_0011
batch_accu [1566808142747] metrics:
{"name":"batch_accu","tmst":1566808142747,"value":{"total_count":250000,"miss_count":980,"matched_count":249020,"matchedFraction":0.99608}}
[1566808142747] 1566808167917: process using time: 25170 ms
[1566808142747] batch_accu finish
```

跑完任务之后，可以看到对比结果总条数 250000 未匹配上的数有 980 条，匹配上的数据有 249020 条，匹配分数为 0.99608。

也可以去 HDFS 上查看结果




根据任务 id 号，下载 missRecords 文件，里面保存的所有没匹配上的数据，方便分析问题。




### 3.4.2 性能分析度量 Profiling Measure

如果想查看最大值、总个数、空值个数、最大长度等值那就得创建 profiling measure

1）创建 json 文件定制规则

vim dq2.json

```
{
  "name": "batch_prof",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.2",
          "config": {
            "database": "tmp",
            "table.name": "demo_tgt"
          }
        }
      ]
    }
  ],
  "evaluate.rule": {
    "rules": [
      {
        "dsl.type": "griffin-dsl",
        "dq.type": "profiling",
        "out.dataframe.name": "prof",
        "rule": "src.id.count() AS id_count, src.age.max() AS age_max,
src.desc.length().max() AS desc_length_max",
        "out": [
```

```
        {
          "type": "metric",
          "name": "prof"
        }
      ]
    }
  ]
 },
 "sinks": ["CONSOLE", "HDFS"]
}
```

同样 rule 选项编写规则，如当前规则统计 id 总个数、age 最大值和 desc 最大长度。具体 rule 规则可查看官网

https://github.com/apache/griffin/blob/master/griffin-doc/measure/measure-batch-sample.md

2）编辑 env.json

vim env.json

```
{
 "spark": {
  "log.level": "WARN"
 },
 "sinks": [
  {
   "type": "console"
  },
  {
   "type": "hdfs",
   "config": {
    "path": "hdfs://hadoop102:9000/griffin/persist"
   }
  },
  {
   "type": "elasticsearch",
   "config": {
    "method": "post",
    "api": "http://hadoop102:9200/griffin/accuracy"
   }
  }
 ]
}
```

分别指定 hdfs 结果存储路径和 elasticsearch 路径

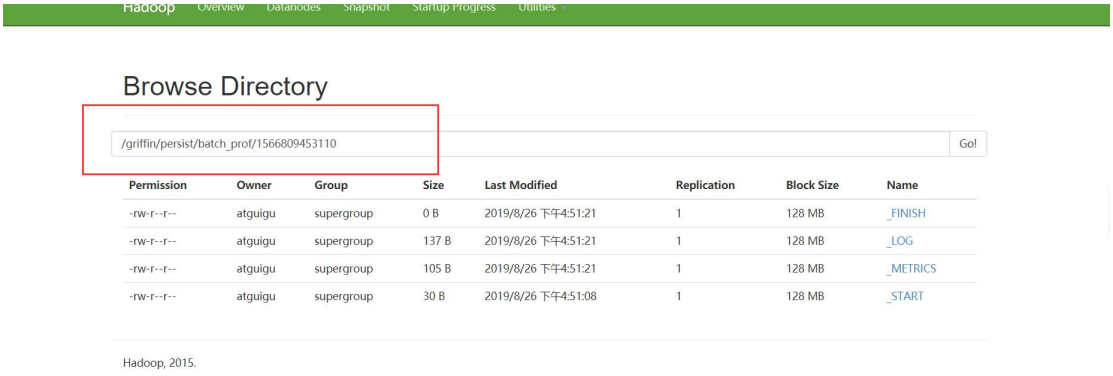
两个 json 文件编写完毕后 指定 /opt/module/griffin-0.4.0/measure/target 该路径下的 griffin-measure.jar 运行 spark 任务

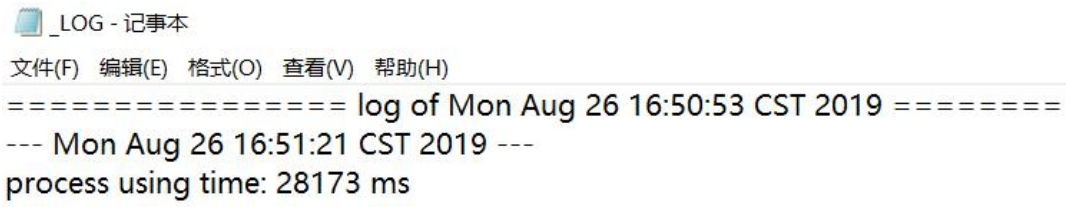
3）Spark 提交脚本命令

spark-submit --class org.apache.griffin.measure.Application --master yarn --deploy-mode client --driver-memory 1g --executor-memory 1g --num-executors 1 griffin-measure.jar env.json dq2.json

```
[1566809453110] batch_prof start: application_1566800981025_0012
batch_prof [1566809453110] metrics:
{"name":"batch_prof","tmst":1566809453110,"value":{"id_count":250000,"age_max":1000,"desc_length_max":4}}
```

跑完任务后，显示结果 id 个数一共 250000 条，age 最大值 1000，desc 长度最大值 4，对应 hdfs 路径，env.json 路径加时间戳。





## 3.5 Rule 规则编写

### 3.5.1 空值个数查询

```
"name": "batch_prof",
"process.type": "batch",
"data.sources": [
  {
    "name": "src",
    "baseline": true,
    "connectors": [
      {
        "type": "hive",
        "version": "2.2",
        "config": {
          "database": "tmp",
          "table.name": "demo_tgt"
        }
      }
    ]
  }
],
"evaluate.rule": {
  "rules": [
    {
      "dsl.type": "griffin-dsl",
      "dq.type": "profiling",
      "out.dataframe.name": "prof",
      "rule": "select count(id) from src where id is null",
      "out": [
        {
          "type": "metric",
          "name": "prof"
        }
      ]
    }
  ]
},
"sinks": ["CONSOLE", "HDFS"]
```

在 rule 里可以写 sql 比如当前 rule 中统计 id 为空的个数，注意查询时，不是查询表名而是查询 name 名称

```
batch_prof [1566810731958] metrics:
{"name":"batch_prof","tmst":1566810731958,"value":{"count":0}}
```

### 3.5.2 去重个数统计

```
{
  "name": "batch_prof",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.2",
          "config": {
            "database": "tmp",
            "table.name": "demo_tgt"
          }
        }
      ]
    }
  ],
  "evaluate.rule": {
    "rules": [
      {
        "dsl.type": "griffin-dsl",
        "dq.type": "profiling",
        "out.dataframe.name": "prof",
        "rule": "select distinct  count(id) from src ",
        "out": [
          {
            "type": "metric",
            "name": "prof"
          }
        ]
      }
    ]
  },
  "sinks": ["CONSOLE", "HDFS"]
}
```

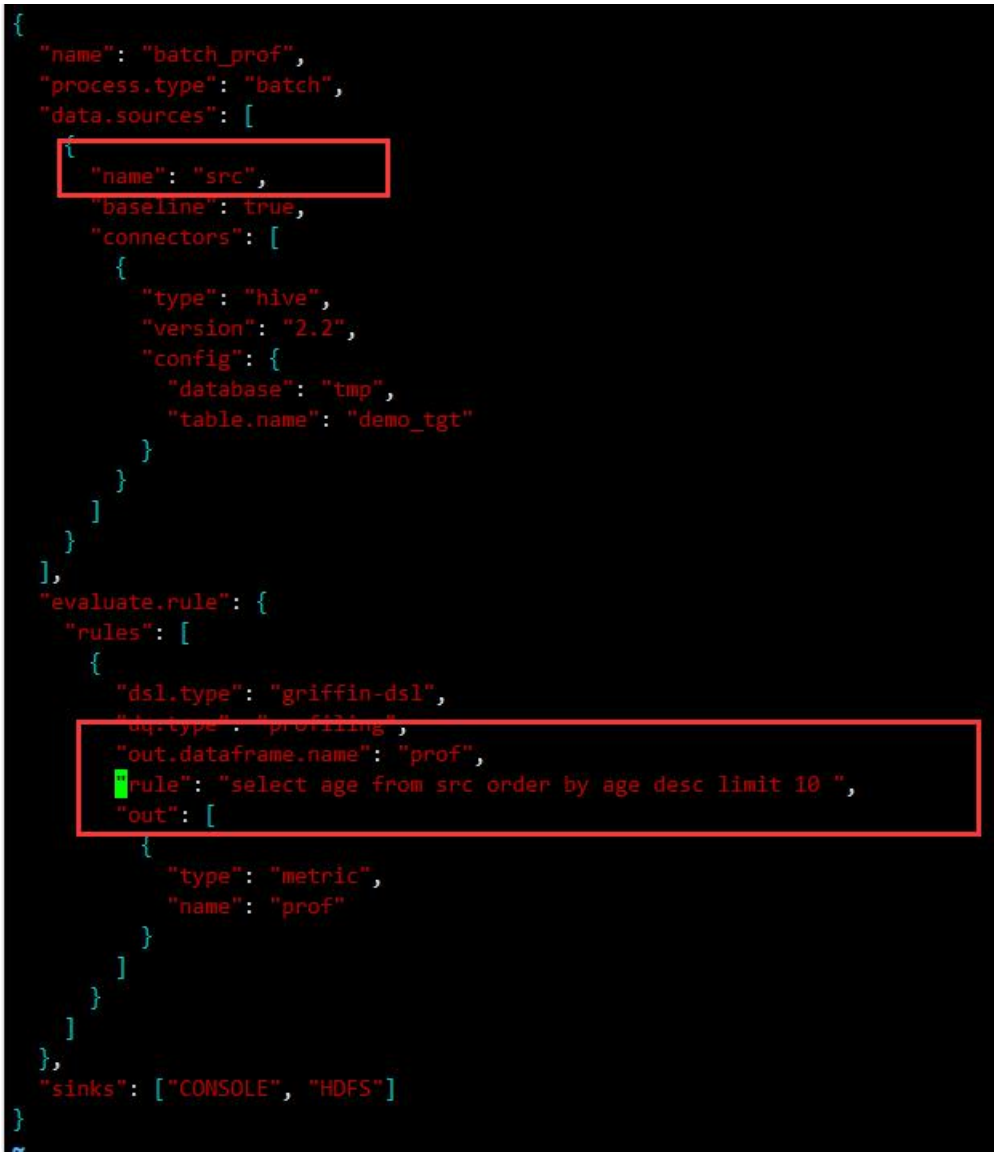
```
batch_prof [1566811098646] metrics:
{"name":"batch_prof","tmst":1566811098646,"value":{"count":250000}}
```

### 3.5.3 最大值、最小值

```
{
  "name": "batch_prof",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.2",
          "config": {
            "database": "tmp",
            "table.name": "demo_tgt"
          }
        }
      ]
    }
  ],
  "evaluate.rule": {
    "rules": [
      {
        "dsl.type": "griffin-dsl",
        "dq.type": "profiling",
        "out.dataframe.name": "prof",
        "rule": "select max(age),min(age) from src ",
        "out": [
          {
            "type": "metric",
            "name": "prof"
          }
        ]
      }
    ]
  },
  "sinks": ["CONSOLE", "HDFS"]
}
```

```
{"name":"batch_prof","tmst":1566815829848,"value":{"max":1000,"min":1}}
```

### 3.5.4 排序



```
{
  "name": "batch_prof",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.2",
          "config": {
            "database": "tmp",
            "table.name": "demo_tgt"
          }
        }
      ]
    }
  ],
  "evaluate.rule": {
    "rules": [
      {
        "dsl.type": "griffin-dsl",
        "dq.type": "profiling",
        "out.dataframe.name": "prof",
        "rule": "select age from src order by age desc limit 10 ",
        "out": [
          {
            "type": "metric",
            "name": "prof"
          }
        ]
      }
    ]
  },
  "sinks": ["CONSOLE", "HDFS"]
}
```

```
batch_prof [1566816648178] metrics:
{"name":"batch_prof","tmst":1566816648178,"value":{"prof":[{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000},{"age":1000}]}}
[1566816648178] 1566816674842: process using time: 26664 ms
```

### 3.5.5 范围查询

```
{
  "name": "batch_prof",
  "process.type": "batch",
  "data.sources": [
    {
      "name": "src",
      "baseline": true,
      "connectors": [
        {
          "type": "hive",
          "version": "2.2",
          "config": {
            "database": "tmp",
            "table.name": "demo_tgt"
          }
        }
      ]
    }
  ],
  "evaluate.rule": {
    "rules": [
      {
        "dsl.type": "griffin-dsl",
        "dq.type": "profiling",
        "out.dataframe.name": "prof",
        "rule": "select count(*) from src where age between 0 and 50 ",
        "out": [
          {
            "type": "metric",
            "name": "prof"
          }
        ]
      }
    ]
  },
  "sinks": ["CONSOLE", "HDFS"]
}
```

```
batch_prof [1566820801985] metrics:
{"name":"batch_prof","tmst":1566820801985,"value":{"count":12500}}
```