Apache Pulsar 实战篇

传智教育大数据平台

Stream Native

黑马程序员 www.itheima.com 传智教育旗下 高端IT教育品牌

PULSAR

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学习目标

Learning Objectives

1. 理解项目的架构实施
2. 掌握Canal集成Pulsar方案
3. 掌握Pulsar与Flink集成
4. 完成HBase对接Phoenix与Hive
5. 完成基于CK的实时数仓分析
6. 能够基于FineBI完成报表处理

01 传智教育大数据平台架构介绍

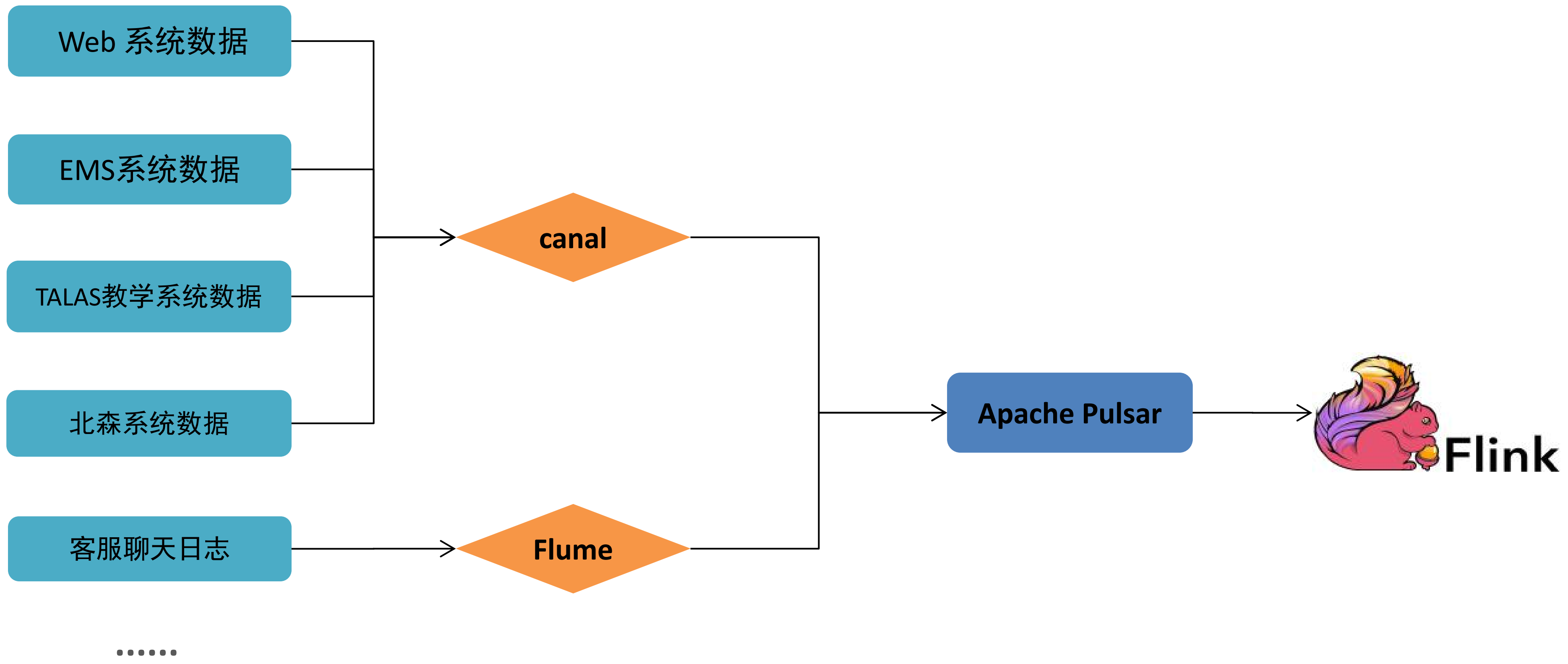
传智教育大数据平台基本介绍

大数据平台是传智教育在2016年初开始构建，最初始主要是进行离线的数仓平台构建,力争将公司核心数据(访问咨询数据,意向用户,报名数据以及学员考勤数据等)进行整合,对这些过往数据以天为单位进行挖掘分析，从而能够更加了解学员的相关的指标，能够更好的为学员服务

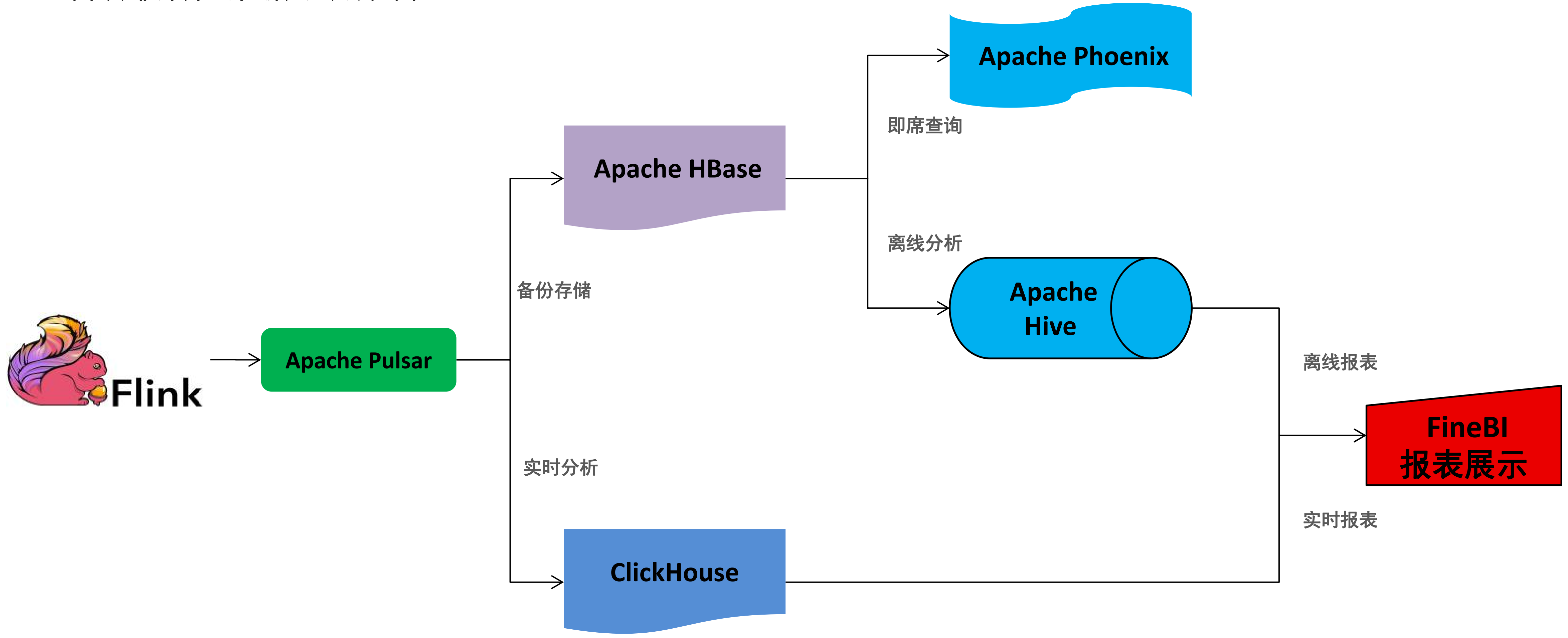
在2021年初，大数据平台开始引入流式的处理，主要采用Pulsar完成实时数据的传输，基于Flink进行实时数据预处理以及转换操作，最终基于CK完成实时指标统计，构建实时数仓

同时公司高层要求能够快速便捷的查询过去历史数据集，为了满足此需要，我们对离线平台做了重新设计,将其纳入流式平台中，构建基于HBase的实时查询系统以及离线分析平台，对整个大数据平台进行重构

传智教育大数据平台架构



传智教育大数据平台架构



02

传智教育实战项目介绍

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传智教育实战项目介绍

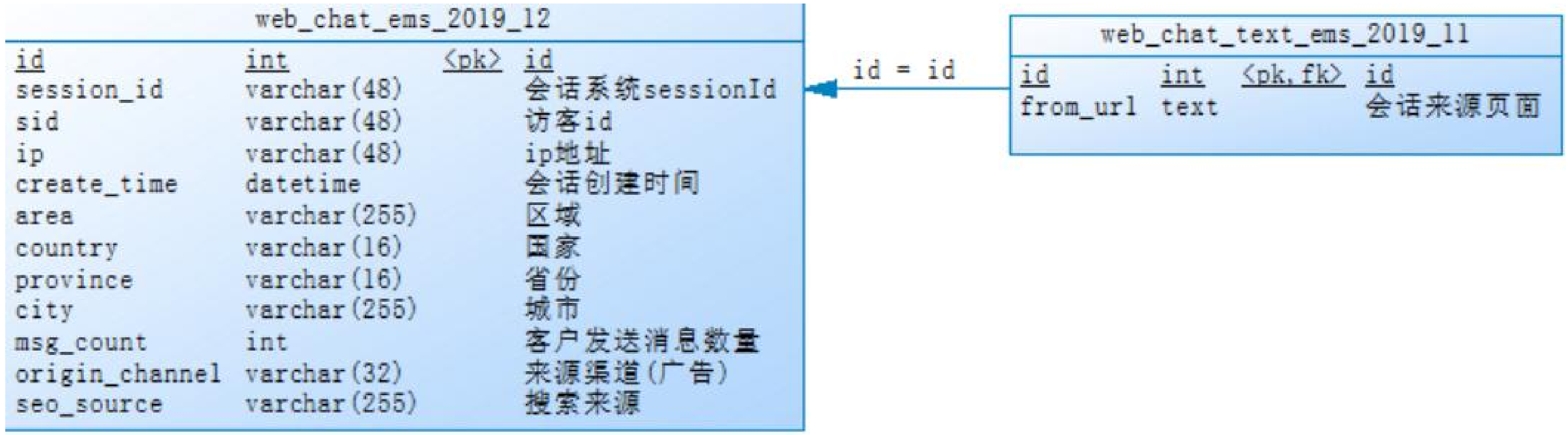
传智教育整个大数据平台大致设计了有以下多个主题的流批开发：访问咨询，意向用户主题，线索主题，报名用户主题，学生考勤主题，学员就业主题,标签画像等.

本次课程主要以访问咨询主题为代表，讲解传智教育整个项目开发流程以及实施方案

数据源说明：

本主题主要涉及到核心表有二个 web_chat_ems 表 和 web_chat_text_ems表

核心字段介绍：



web_chat_ems_2019_12

id	int	<pk>	id
session_id	varchar(48)		会话系统sessionId
sid	varchar(48)		访客id
ip	varchar(48)		ip地址
create_time	datetime		会话创建时间
area	varchar(255)		区域
country	varchar(16)		国家
province	varchar(16)		省份
city	varchar(255)		城市
msg_count	int		客户发送消息数量
origin_channel	varchar(32)		来源渠道(广告)
seo_source	varchar(255)		搜索来源

web_chat_text_ems_2019_11

id	int	<pk,fk>	id
from_url	text		会话来源页面

传智教育实战项目介绍

离线业务需求： 1. 总访问客户量 2. 地区独立访客 3. 访客咨询率：咨询率=发起咨询的人数/访问客户量 4. 客户访问量和访客咨询率趋势 5. 各时间段访问客户量 6. 各来源渠道/各搜索来源访问量 7. 活跃页面TOP10 指标： 访问量，咨询量 维度： 日期：年、月、天、小时 地区、来源渠道、搜索来源、受访页面	实时业务需求： 1. 总访问客户量 2. 总访客咨询量 3. 访客咨询率：咨询率=发起咨询的人数/访问客户量 指标： 1. 总访问量 2. 总咨询量 3. 咨询率 维度： 日期：当天，小时

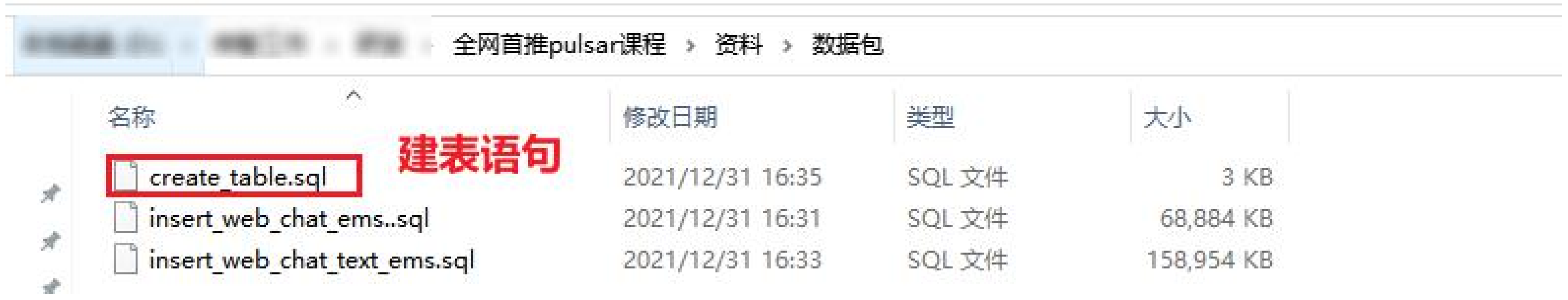
03 初始化数据源

初始化数据源：在Mysql中建库建表

- 1- 创建库：

```
CREATE DATABASE itcast_ems CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci ;
```

- 2- 构建表：构建 web_chat_ems 和 web_chat_text_ems


全网首推pulsar课程 › 资料 › 数据包

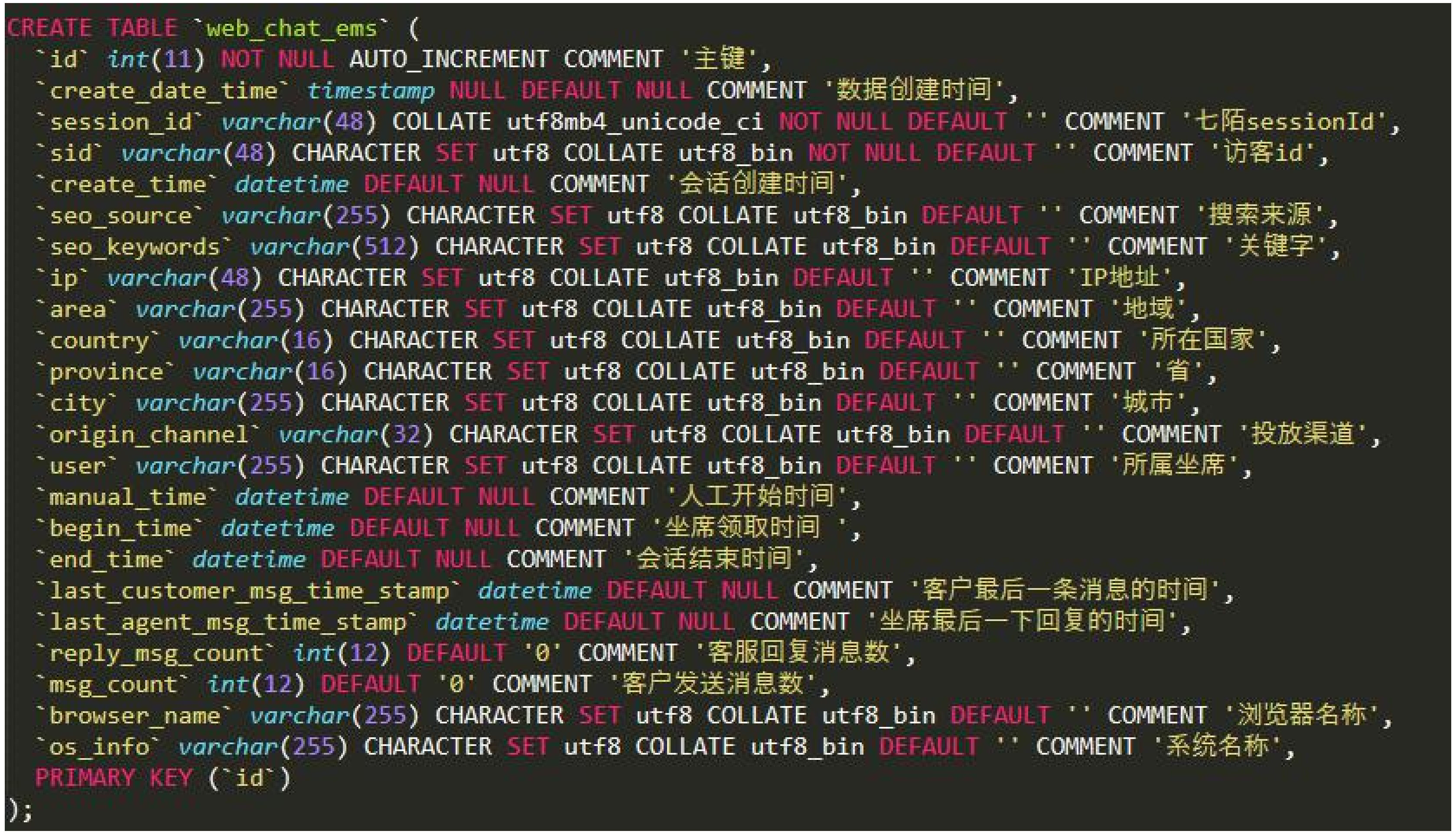
名称	修改日期	类型	大小
create_table.sql	2021/12/31 16:35	SQL 文件	3 KB
insert_web_chat_ems..sql	2021/12/31 16:31	SQL 文件	68,884 KB
insert_web_chat_text_ems.sql	2021/12/31 16:33	SQL 文件	158,954 KB

说明：

将文件中建表语句复制出来，进行执行，即可构建相关表

初始化数据源：在Mysql中建库建表

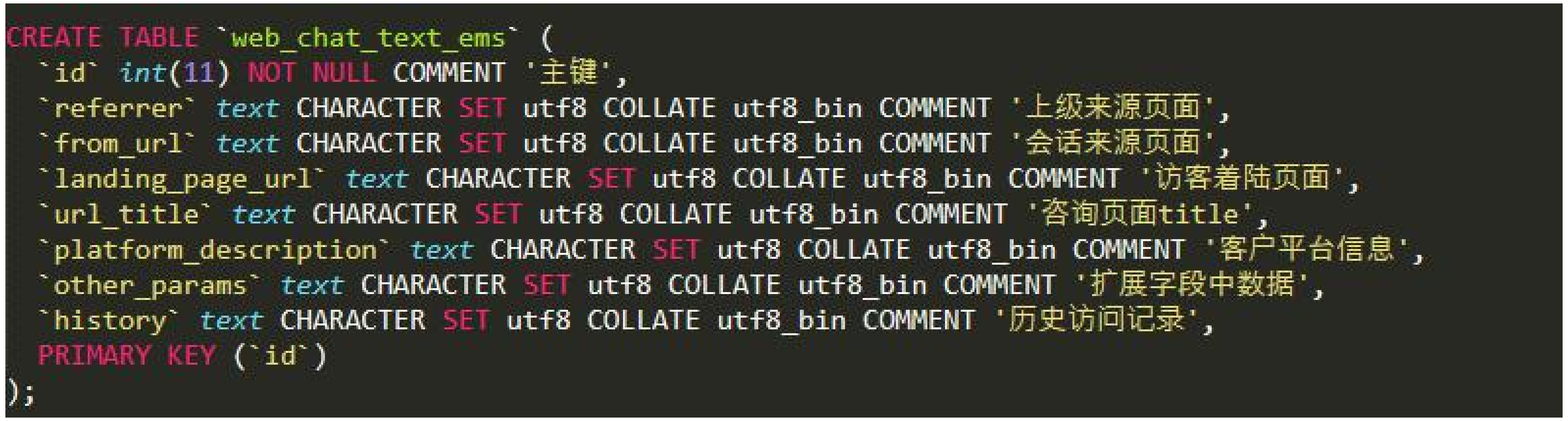
- 表字段完整说明：



```sql
CREATE TABLE `web_chat_ems` (
  `id` int(11) NOT NULL AUTO_INCREMENT COMMENT '主键',
  `create_date_time` timestamp NULL DEFAULT NULL COMMENT '数据创建时间',
  `session_id` varchar(48) COLLATE utf8mb4_unicode_ci NOT NULL DEFAULT '' COMMENT '七陌sessionId',
  `sid` varchar(48) CHARACTER SET utf8 COLLATE utf8_bin NOT NULL DEFAULT '' COMMENT '访客id',
  `create_time` datetime DEFAULT NULL COMMENT '会话创建时间',
  `seo_source` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '搜索来源',
  `seo_keywords` varchar(512) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '关键字',
  `ip` varchar(48) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT 'IP地址',
  `area` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '地域',
  `country` varchar(16) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '所在国家',
  `province` varchar(16) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '省',
  `city` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '城市',
  `origin_channel` varchar(32) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '投放渠道',
  `user` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '所属坐席',
  `manual_time` datetime DEFAULT NULL COMMENT '人工开始时间',
  `begin_time` datetime DEFAULT NULL COMMENT '坐席领取时间 ',
  `end_time` datetime DEFAULT NULL COMMENT '会话结束时间',
  `last_customer_msg_time_stamp` datetime DEFAULT NULL COMMENT '客户最后一条消息的时间',
  `last_agent_msg_time_stamp` datetime DEFAULT NULL COMMENT '坐席最后一下回复的时间',
  `reply_msg_count` int(12) DEFAULT '0' COMMENT '客服回复消息数',
  `msg_count` int(12) DEFAULT '0' COMMENT '客户发送消息数',
  `browser_name` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '浏览器名称',
  `os_info` varchar(255) CHARACTER SET utf8 COLLATE utf8_bin DEFAULT '' COMMENT '系统名称',
  PRIMARY KEY (`id`)
);
```

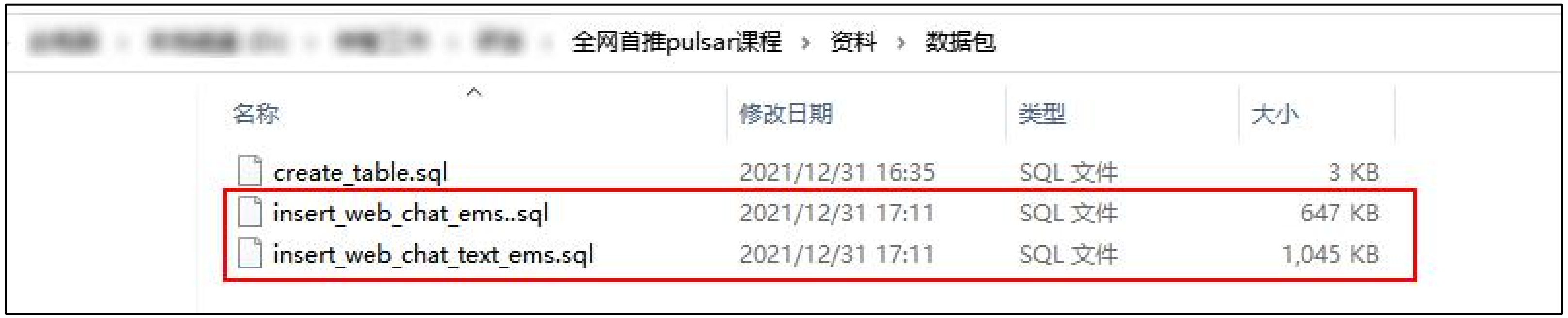
初始化数据源：在Mysql中建库建表

● 表字段完整说明：



```
CREATE TABLE `web_chat_text_ems` (
  `id` int(11) NOT NULL COMMENT '主键',
  `referrer` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '上级来源页面',
  `from_url` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '会话来源页面',
  `landing_page_url` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '访客着陆页面',
  `url_title` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '咨询页面title',
  `platform_description` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '客户平台信息',
  `other_params` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '扩展字段中数据',
  `history` text CHARACTER SET utf8 COLLATE utf8_bin COMMENT '历史访问记录',
  PRIMARY KEY (`id`)
);
```

本次两个表各提供了1000条数据,进行后续的测试操作,目前暂时不导入



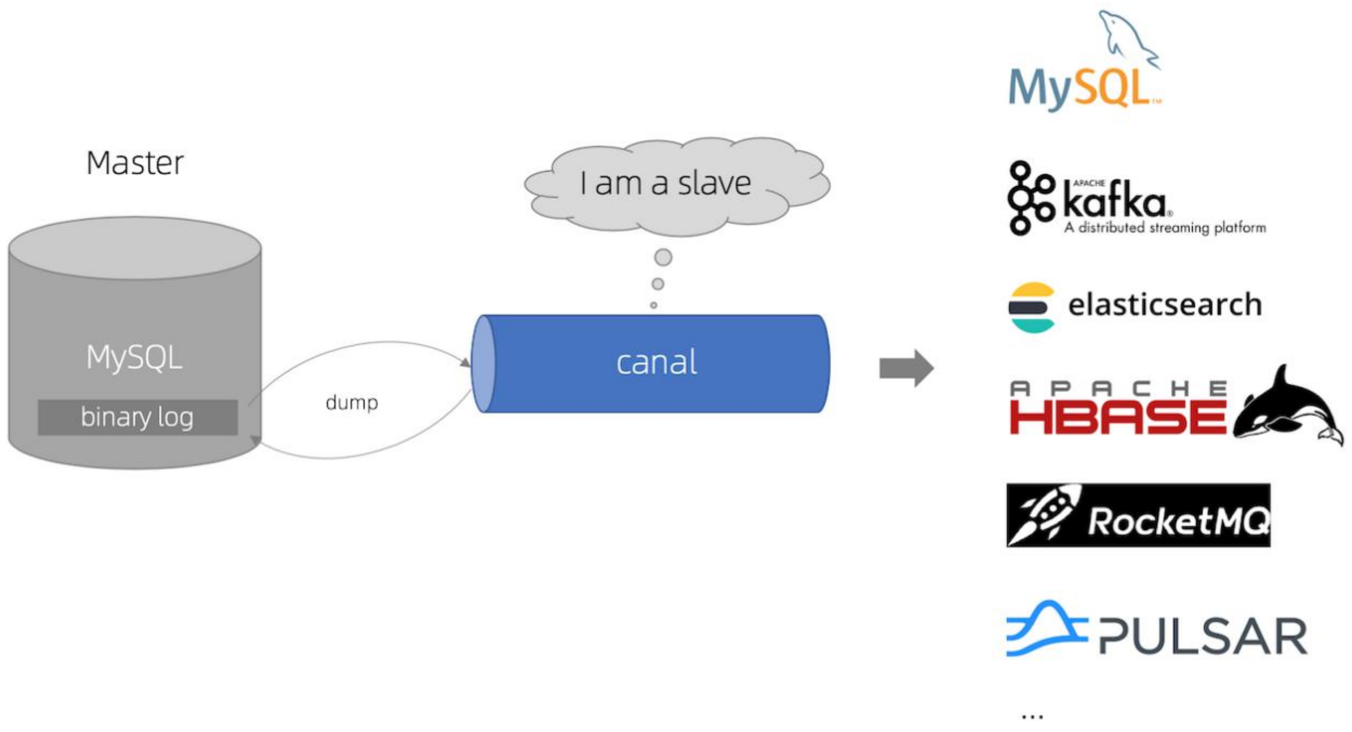
[redacted] › 全网首推pulsar课程 › 资料 › 数据包

名称	修改日期	类型	大小
create_table.sql	2021/12/31 16:35	SQL 文件	3 KB
insert_web_chat_ems..sql	2021/12/31 17:11	SQL 文件	647 KB
insert_web_chat_text_ems.sql	2021/12/31 17:11	SQL 文件	1,045 KB

04

基于Canal采集数据到Pulsar

Canal基本介绍



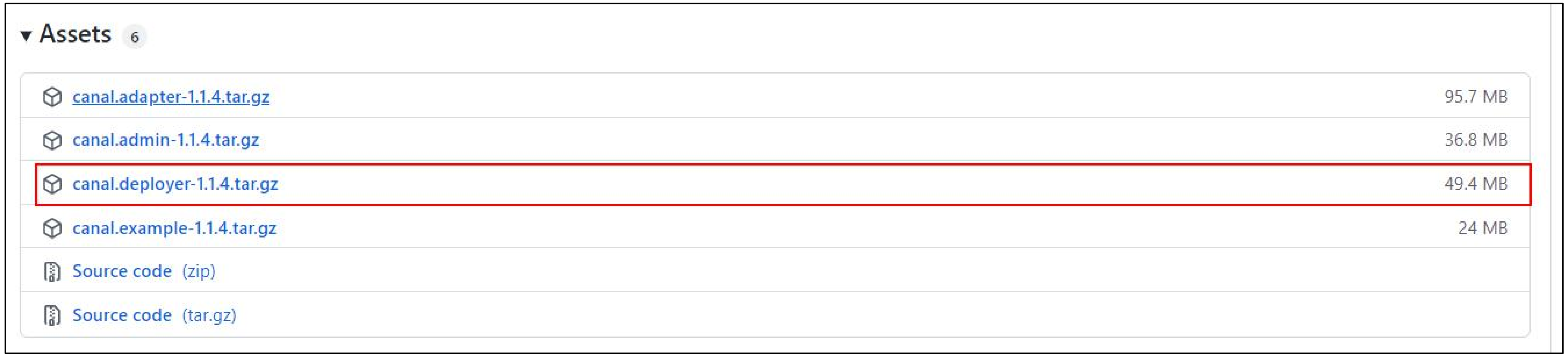
- 基于 MySQL 数据库增量日志解析，提供增量数据订阅和消费
- 早期阿里巴巴因为杭州和美国双机房部署，存在跨机房同步的业务需求，实现方式主要是基于业务 trigger（触发器） 获取增量变更

Canal基本介绍

- 从 2010 年开始，业务逐步尝试数据库日志解析获取增量变更进行同步，由此衍生出了大量的数据库增量订阅和消费业务，基于日志增量订阅和消费的业务包括
  - 数据库镜像
  - 数据库实时备份
  - 索引构建和实时维护(拆分异构索引、倒排索引等)
  - 业务 cache 刷新
  - 带业务逻辑的增量数据处理
- 当前的 canal 支持源端 MySQL 版本包括 5.1.x , 5.5.x , 5.6.x , 5.7.x , 8.0.x
- github地址：https://github.com/alibaba/canal

Canal安装

下载地址：https://github.com/alibaba/canal/releases/tag/canal-1.1.4/



▾ Assets 6

canal.adapter-1.1.4.tar.gz	95.7 MB
canal.admin-1.1.4.tar.gz	36.8 MB
canal.deployer-1.1.4.tar.gz	49.4 MB
canal.example-1.1.4.tar.gz	24 MB
Source code (zip)	
Source code (tar.gz)	

或：大家可以直接选择资料中提供好的下载包

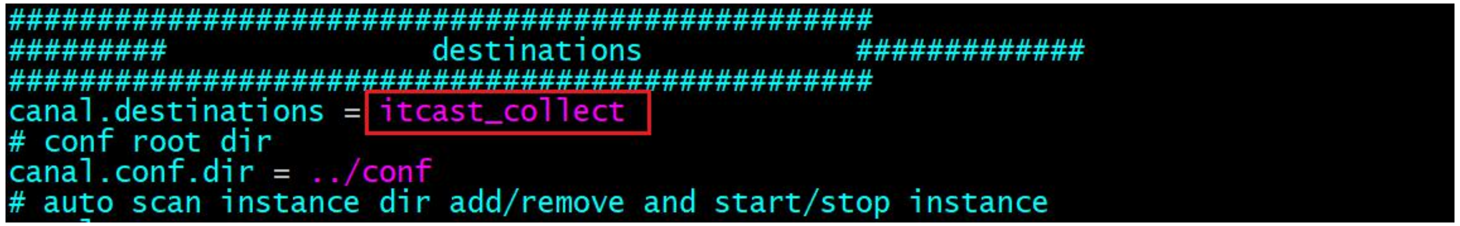
- 1- 将下载好的canal安装包 上传到/export/software 目录下
- 2- 在/export/servers/创建文件夹canal，将canal.deployer-1.1.4.tar.gz 解压到该目录

```
mkdir /export/servers/canal
tar -zxvf canal.deployer-1.1.4.tar.gz -C /export/server/canal
```

基于canal采集MySQL数据到Pulsar

- 1- 修改canal下的conf目录中canal.properties

```
cd /export/server/canal/conf
vim canal.properties
内容如下:
修改96行: 指定采集目的地的配置文件路径所在的目录名字
canal.destinations = itcast_collect

注: 可以配置多个, 配置几个, 后续就得按照这个名字配置几个目录, 构建目的地配置信息
```



```
#################################################
#########               destinations            ##############
#################################################
canal.destinations = itcast_collect
# conf root dir
canal.conf.dir = ../conf
# auto scan instance dir add/remove and start/stop instance
```

- 2- 在conf目录下，创建 itcast_collect 目录

```
cd  /export/server/canal/conf
mkdir -p itcast_collect
```

基于canal采集MySQL数据到Pulsar

- 3- 将conf下的example目录中的instance.properties 拷贝到刚刚创建的 itcast_collect 中

```
cd /export/server/canal/conf
cp example/instance.properties itcast_collect/
```

- 4- 进入itcast_collect, 编辑instance.properties文件

```
cd  /export/server/canal/conf/itcast_collect
vim instance.properties

修改如下:
# 第9行
canal.instance.master.address=node1.itcast.cn:3306
# 第 33和34行:
canal.instance.dbUsername=root
canal.instance.dbPassword=123456
# 第 41行:
canal.instance.filter.regex=itcast_ems\\..*
#50行: 删除topic名称
canal.mq.topic=
```

基于canal采集MySQL数据到Pulsar

- 5- 在Pulsar配置与canal对接的配置信息

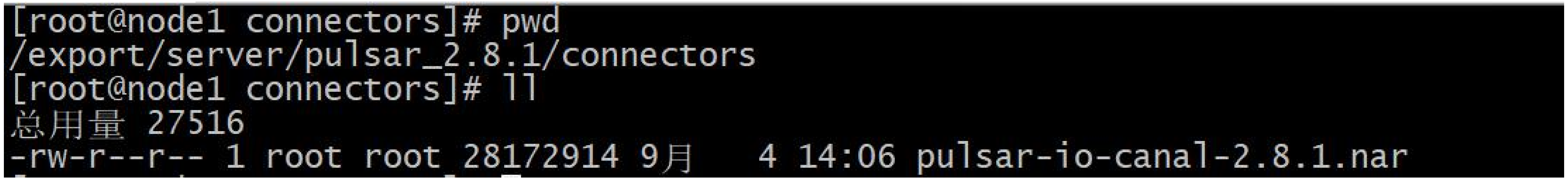
```
cd /export/server/pulsar_2.8.1/conf/
vim canal-mysql-source-config.yaml

内容如下:
configs:
   zkServers: ""
   batchSize: "1"
   destination: "itcast_collect"
   username: "canal"
   password: "canal"
   cluster: false
   singleHostname: "node1.itcast.cn"
   singlePort: "11111"
```

基于canal采集MySQL数据到Pulsar

- 6-下载Pulsar与Canal集成的connector IO 依赖包

```
cd /export/server/pulsar_2.8.1
mkdir -p connectors
进入connectors目录:
cd /export/server/brokers/connectors

执行下载
wget https://archive.apache.org/dist/pulsar/pulsar-2.8.1/connectors/pulsar-io-canal-2.8.1.nar
```

或者，可以选择直接将资料中提供好的io包进行上传即可

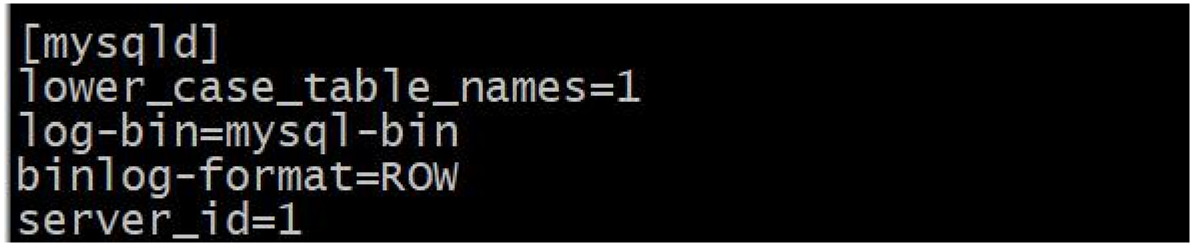


```
[root@node1 connectors]# pwd
/export/server/pulsar_2.8.1/connectors
[root@node1 connectors]# ll
总用量 27516
-rw-r--r-- 1 root root 28172914 9月   4 14:06 pulsar-io-canal-2.8.1.nar
```

开启Mysql BinLog日志

- 修改mysql的配置文件(本次课程 MySQL安装在node1节点上)

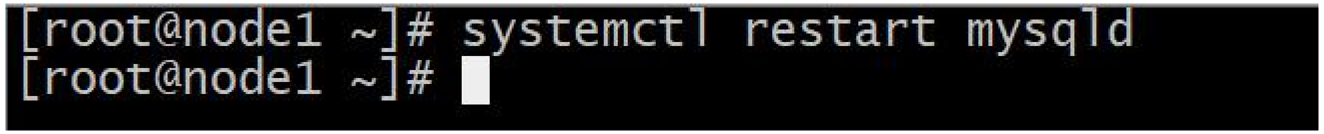
```
vim /etc/m.cnf

在[mysqld]标签下，新增如下代码：
lower_case_table_names=1
log-bin=mysql-bin # 开启 binlog
binlog-format=ROW # 选择 ROW 模式,可选值[STATEMENT(记录SQL) |ROW(记录数据) | MIXED(混合使用) ]
server_id=1 # 配置 MySQL 主从复制,需要定义，不要和 canal 的 slaveId 重复
```



```
[mysqld]
lower_case_table_names=1
log-bin=mysql-bin
binlog-format=ROW
server_id=1
```

- 重启mysql服务

```
systemctl restart mysqld
```



```
[root@node1 ~]# systemctl restart mysqld
[root@node1 ~]# 
```

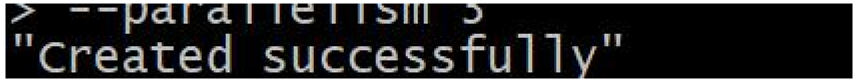
启动 Pulsar Connectors

- 1- 在Pulsar中创建Topic

```
bin/pulsar-admin topics create-partitioned-topic persistent://public/default/itcast_canal_collect  --partitions 3
```

- 2- 创建并启动connector

```
./bin/pulsar-admin source create \
--archive ./connectors/pulsar-io-canal-2.8.1.nar \
--classname org.apache.pulsar.io.canal.CanalStringSource \
--tenant public \
--namespace default \
--name canal_collect \
--destination-topic-name itcast_canal_collect \
--source-config-file /export/server/pulsar_2.8.1/conf/canal-mysql-source-config.yaml \
--parallelism 3
```

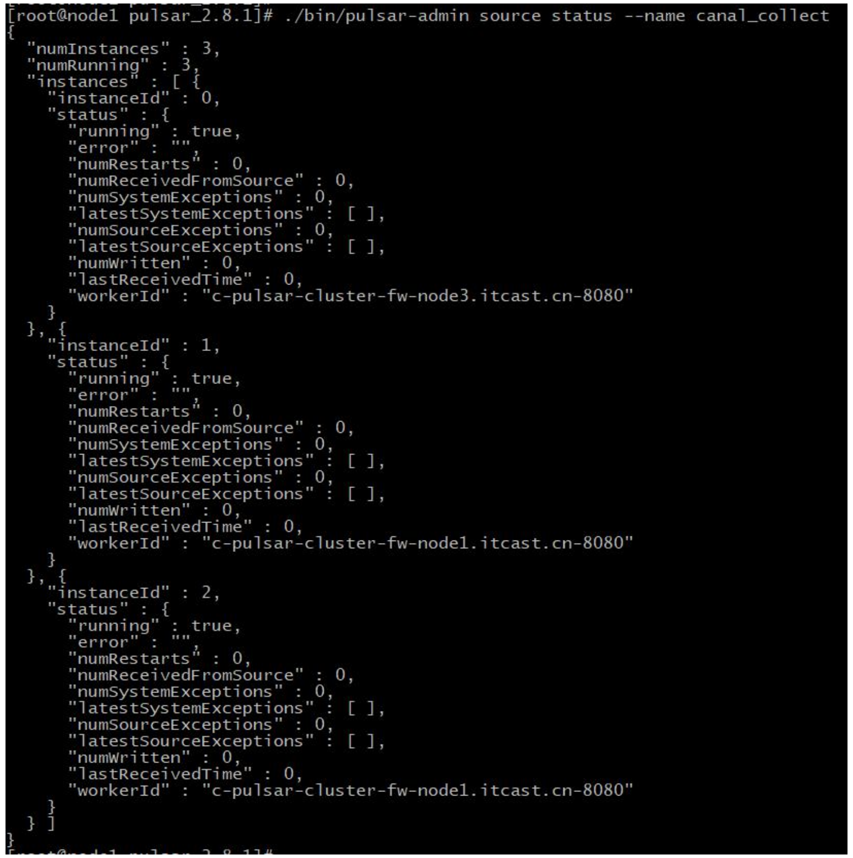


```
> --parallelism 3
"Created successfully"
```

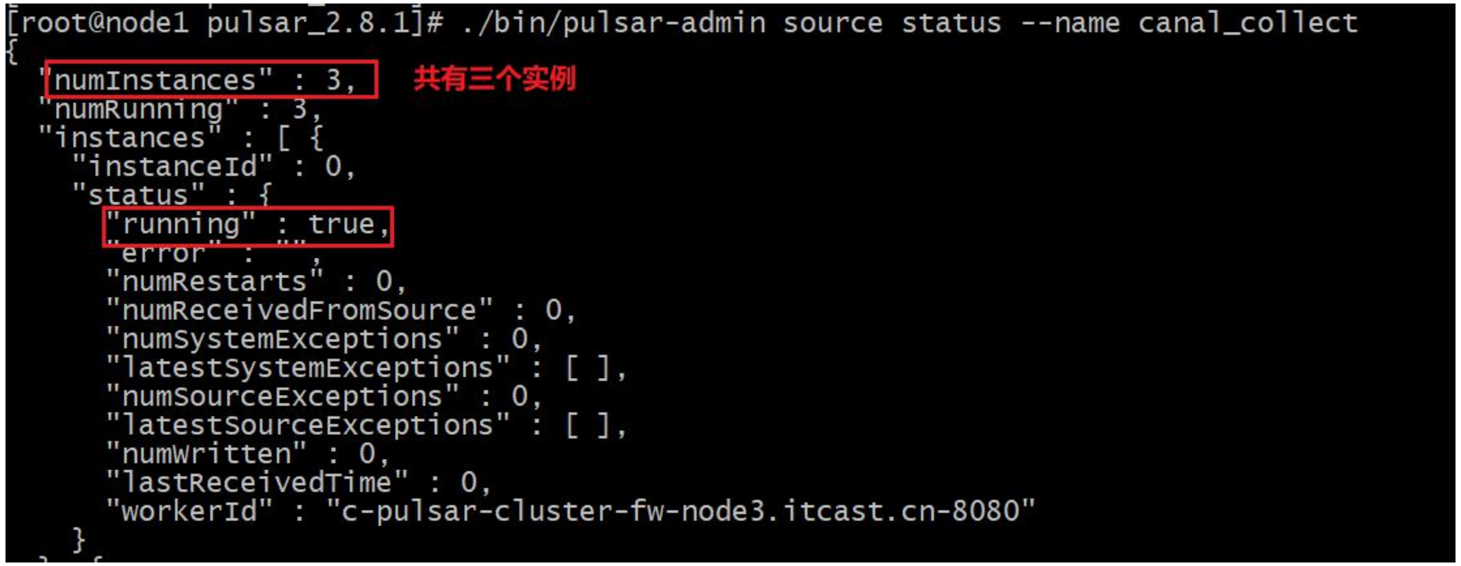
启动 Pulsar Connectors

- 3- 查看状态信息

```
./bin/pulsar-admin source status --name canal_collect
```



```
[root@node1 pulsar_2.8.1]# ./bin/pulsar-admin source status --name canal_collect
{
  "numInstances" : 3,
  "numRunning" : 3,
  "instances" : [ {
    "instanceId" : 0,
    "status" : {
      "running" : true,
      "error" : "",
      "numRestarts" : 0,
      "numReceivedFromSource" : 0,
      "numSystemExceptions" : 0,
      "latestSystemExceptions" : [ ],
      "numSourceExceptions" : 0,
      "latestSourceExceptions" : [ ],
      "numWritten" : 0,
      "lastReceivedTime" : 0,
      "workerId" : "c-pulsar-cluster-fw-node3.itcast.cn-8080"
    }
  }, {
    "instanceId" : 1,
    "status" : {
      "running" : true,
      "error" : "",
      "numRestarts" : 0,
      "numReceivedFromSource" : 0,
      "numSystemExceptions" : 0,
      "latestSystemExceptions" : [ ],
      "numSourceExceptions" : 0,
      "latestSourceExceptions" : [ ],
      "numWritten" : 0,
      "lastReceivedTime" : 0,
      "workerId" : "c-pulsar-cluster-fw-node1.itcast.cn-8080"
    }
  }, {
    "instanceId" : 2,
    "status" : {
      "running" : true,
      "error" : "",
      "numRestarts" : 0,
      "numReceivedFromSource" : 0,
      "numSystemExceptions" : 0,
      "latestSystemExceptions" : [ ],
      "numSourceExceptions" : 0,
      "latestSourceExceptions" : [ ],
      "numWritten" : 0,
      "lastReceivedTime" : 0,
      "workerId" : "c-pulsar-cluster-fw-node1.itcast.cn-8080"
    }
  } ]
}
```



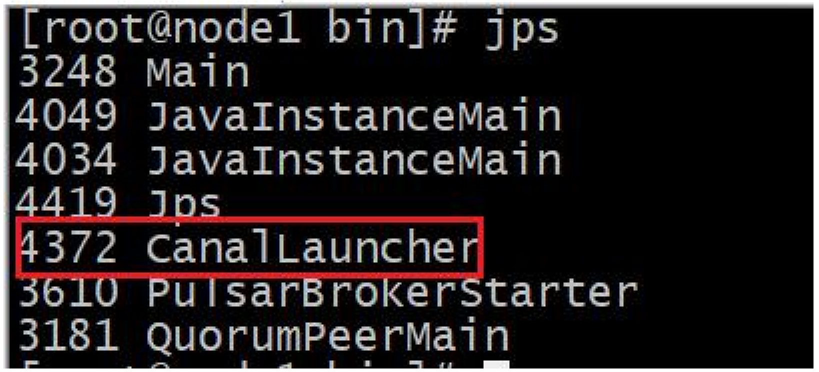
```
[root@node1 pulsar_2.8.1]# ./bin/pulsar-admin source status --name canal_collect
{
  "numInstances" : 3,
  "numRunning" : 3,
  "instances" : [ {
    "instanceId" : 0,
    "status" : {
      "running" : true,
      "error" : "",
      "numRestarts" : 0,
      "numReceivedFromSource" : 0,
      "numSystemExceptions" : 0,
      "latestSystemExceptions" : [ ],
      "numSourceExceptions" : 0,
      "latestSourceExceptions" : [ ],
      "numWritten" : 0,
      "lastReceivedTime" : 0,
      "workerId" : "c-pulsar-cluster-fw-node3.itcast.cn-8080"
    }
```

共有三个实例

启动 Canal开始进行采集数据

- 1- 查看状态信息

```
cd /export/servers/canal/bin
sh startup.sh
```

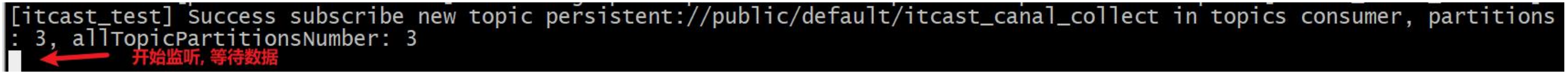


```
[root@node1 bin]# jps
3248 Main
4049 JavaInstanceMain
4034 JavaInstanceMain
4419 Jps
4372 CanalLauncher
3610 PulsarBrokerStarter
3181 QuorumPeerMain
```

测试:

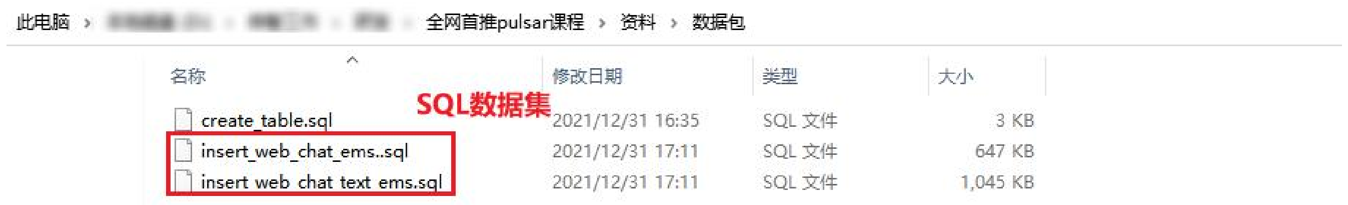
- 1- 在Pulsar中启动一个消费者,用于监听Canal是否可以将数据采集到Pulsar中

```
./bin/pulsar-client consume -s 'itcast_test' -n 0 itcast_canal_collect
```



```
[itcast_test] Success subscribe new topic persistent://public/default/itcast_canal_collect in topics consumer, partitions
: 3, allTopicPartitionsNumber: 3
```

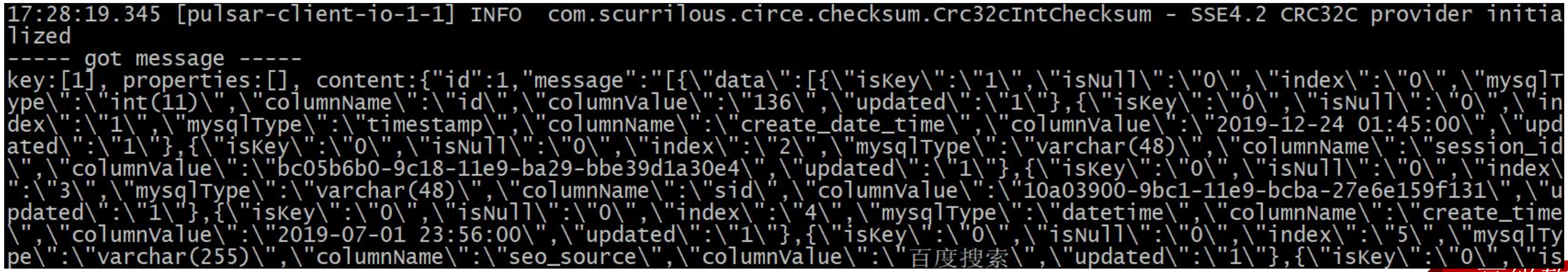
- 2- 将项目中对两个表中添加数据的SQL语句各拿出一条， 添加到mysql中， 观察是否可以采集到



此电脑 › [redacted] › [redacted] › [redacted] › 全网首推pulsar课程 › 资料 › 数据包

名称	修改日期	类型	大小
create_table.sql	2021/12/31 16:35	SQL 文件	3 KB
insert_web_chat_ems..sql	2021/12/31 17:11	SQL 文件	647 KB
insert_web_chat_text_ems.sql	2021/12/31 17:11	SQL 文件	1,045 KB

- 消费者成功收到消息



```
17:28:19.345 [pulsar-client-io-1-1] INFO  com.scurrilous.circe.checksum.Crc32cIntChecksum - SSE4.2 CRC32C provider initia
lized
----- got message -----
key:[1], properties:[], content:{"id":1,"message":"[{\"data\":[{\"isKey\":\"1\",\"isNull\":\"0\",\"index\":\"0\",\"mysqlT
ype\":\"int(11)\",\"columnName\":\"id\",\"columnValue\":\"136\",\"updated\":\"1\"},{\"isKey\":\"0\",\"isNull\":\"0\",\"in
dex\":\"1\",\"mysqlType\":\"timestamp\",\"columnName\":\"create_date_time\",\"columnValue\":\"2019-12-24 01:45:00\",\"upd
ated\":\"1\"},{\"isKey\":\"0\",\"isNull\":\"0\",\"index\":\"2\",\"mysqlType\":\"varchar(48)\",\"columnName\":\"session_id
\",\"columnValue\":\"bc05b6b0-9c18-11e9-ba29-bbe39d1a30e4\",\"updated\":\"1\"},{\"isKey\":\"0\",\"isNull\":\"0\",\"index\
":\"3\",\"mysqlType\":\"varchar(48)\",\"columnName\":\"sid\",\"columnValue\":\"10a03900-9bc1-11e9-bcba-27e6e159f131\",\"u
pdated\":\"1\"},{\"isKey\":\"0\",\"isNull\":\"0\",\"index\":\"4\",\"mysqlType\":\"datetime\",\"columnName\":\"create_time
\",\"columnValue\":\"2019-07-01 23:56:00\",\"updated\":\"1\"},{\"isKey\":\"0\",\"isNull\":\"0\",\"index\":\"5\",\"mysqlTy
pe\":\"varchar(255)\",\"columnName\":\"seo_source\",\"columnValue\":\"百度搜索\",\"updated\":\"1\"},{\"isKey\":\"0\",\"is
```

05

Pulsar对接Flink完成数据预处理

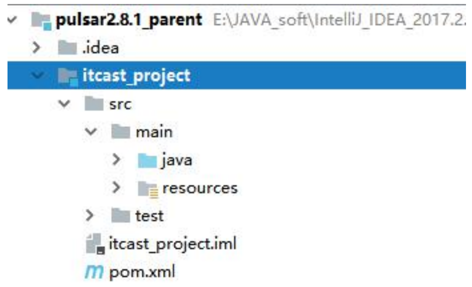
预处理需求说明

- 1- 两个表需要进行Join合并，抽取需求核心相关字段，形成宽表数据
- 2- 对表进行拉宽操作：create_time字段 拉宽为 年、月、天、小时

核心字段:
- web_chat_em:
  - join字段: id
  - 时间维度: create_time
  - 地区维度: area
  - 来源渠道: origin_channel
  - 搜索来源: seo_source
  - 指标字段: sid ,session_id,ip
- web_chat_text_ems_2019_12:
  - 受访页面维度: from_url
  - join字段: id

构建Maven项目,加入依赖

- 1- 创建maven项目： itcast_project



```
pulsar2.8.1_parent  E:\JAVA_soft\IntelliJ_IDEA_2017.2.
  .idea
  itcast_project
    src
      main
        java
        resources
      test
    itcast_project.iml
    pom.xml
```

- 2- 加入相关依赖

```
<repositories><!--代码库-->
    <repository>
        <id>aliyun</id>
        <url>http://maven.aliyun.com/nexus/content/groups/public/</url>
        <releases><enabled>true</enabled></releases>
        <snapshots>
            <enabled>false</enabled>
            <updatePolicy>never</updatePolicy>
        </snapshots>
    </repository>
</repositories>
```

构建Maven项目,加入依赖

```
<dependencies>
  <dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-table-api-java-bridge_2.11</artifactId>
    <version>1.13.1</version>
  </dependency>
  <dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-table-planner-blink_2.11</artifactId>
    <version>1.13.1</version>
  </dependency>
  <dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-streaming-scala_2.11</artifactId>
    <version>1.13.1</version>
  </dependency>
  <dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-table-common</artifactId>
    <version>1.13.1</version>
  </dependency>
```

构建Maven项目,加入依赖

```
<dependency>
  <groupId>org.apache.flink</groupId>
  <artifactId>flink-clients_2.11</artifactId>
  <version>1.13.1</version>
</dependency>
<dependency>
  <groupId>io.streamnative.connectors</groupId>
  <artifactId>pulsar-flink-connector_2.11</artifactId>
  <version>1.13.1.5-rc1</version>

  <exclusions>
    <exclusion>
      <groupId>org.apache.pulsar</groupId>
      <artifactId>pulsar-client-all</artifactId>
    </exclusion>
  </exclusions>
</dependency>
<dependency>
  <groupId>org.apache.pulsar</groupId>
  <artifactId>pulsar-client-all</artifactId>
  <version>2.8.1</version>
</dependency>
```

构建Maven项目,加入依赖

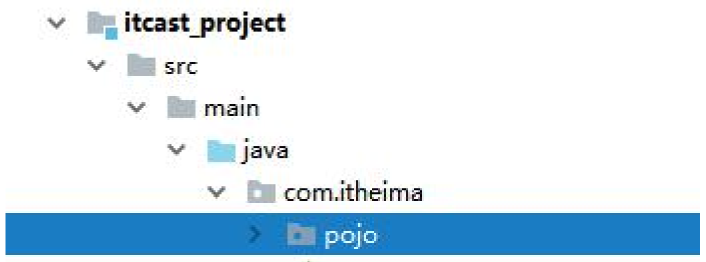
```
 <dependency>
    <groupId>com.alibaba</groupId>
    <artifactId>fastjson</artifactId>
    <version>1.2.62</version>
 </dependency>
<dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-connector-hbase-2.2_2.11</artifactId>
    <version>1.13.1</version>
 </dependency>

 <dependency>
    <groupId>org.apache.hadoop</groupId>
    <artifactId>hadoop-common</artifactId>
    <version>3.0.0</version>
 </dependency>
 <dependency>
    <groupId>org.apache.flink</groupId>
    <artifactId>flink-jdbc_2.11</artifactId>
    <version>1.10.1</version>
 </dependency>
```

构建Maven项目,加入依赖

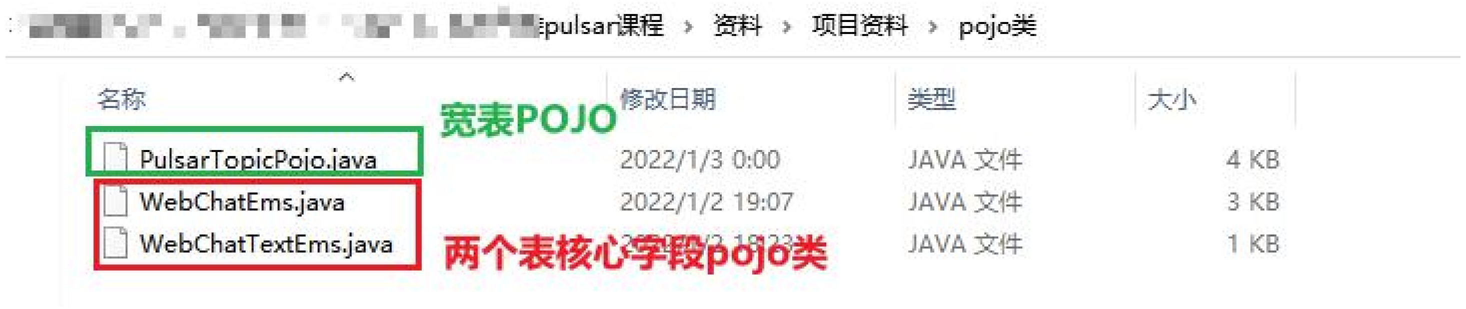
```
        <dependency>
            <groupId>ru.yandex.clickhouse</groupId>
            <artifactId>clickhouse-jdbc</artifactId>
            <version>0.3.2</version>
        </dependency>
        <dependency>
            <groupId>org.apache.httpcomponents</groupId>
            <artifactId>httpcore</artifactId>
            <version>4.4.13</version>
        </dependency>
    </dependencies>
    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-compiler-plugin</artifactId>
                <version>3.1</version>
                <configuration>
                    <target>1.8</target>
                    <source>1.8</source>
                </configuration>
            </plugin>
        </plugins>
    </build>
```

添加相关POJO类

- 1- 在项目中创建: com.itheima.pojo



- 2- 加入资料中Pojo类到此包下



名称	修改日期	类型	大小
PulsarTopicPojo.java	2022/1/3 0:00	JAVA 文件	4 KB
WebChatEms.java	2022/1/2 19:07	JAVA 文件	3 KB
WebChatTextEms.java	2022/1/2 18:23	JAVA 文件	1 KB

编写Flink代码，对数据进行处理操作

● 1- Flink与Pulsar对接, 完成数据消息：Pulsar Connector Flink Source

```
public class ItcastEmsFlink {
    private static PulsarTopicPojo pulsarTopicPojo = new PulsarTopicPojo();
    public static void main(String[] args) throws Exception {
        //1. 创建环境对象
        StreamExecutionEnvironment env = StreamExecutionEnvironment.getExecutionEnvironment();
        StreamTableEnvironment tableEnv = StreamTableEnvironment.create(env);

        //2. 设置 Source
        Properties props = new Properties();
        props.setProperty("topic", "persistent://public/default/itcast_canal_collect");
        props.setProperty("partition.discovery.interval-millis", "5000");
        FlinkPulsarSource<String> pulsarSource = new FlinkPulsarSource<String>(
                "pulsar://node1:6650,node2:6650,node3:6650", "http://node1:8080,node2:8080,node3:8080",
                PulsarDeserializationSchema.valueOnly(new SimpleStringSchema()), props);

        pulsarSource.setStartFromLatest();
        DataStreamSource<String> source = env.addSource(pulsarSource);
```

编写Flink代码，对数据进行处理操作

- 2- 对数据进行转换处理 -- 过滤无用消息数据

```
//3.1: 过滤掉无消息的数据
SingleOutputStreamOperator<String> filterDataStream = source.filter(new FilterFunction<String>() {
  @Override
  public boolean filter(String msg) throws Exception {
    Map<String, Object> msgMap = JSONObject.parseObject(msg, Map.class);
    return !"[]".equals(msgMap.get("message"));
  }
});
```

- 3- 获取其中Data数据: 先获取webChatEms核心字段数据

```
    SingleOutputStreamOperator<WebChatEms> webChatEmsDataStream = filterDataStream.flatMap(new
FlatMapFunction<String, WebChatEms>() {
      @Override
      public void flatMap(String canalJson, Collector<WebChatEms> collector) throws Exception {

        Map<String, Object> msgMap = JSONObject.parseObject(canalJson, Map.class);
        String message = (String) msgMap.get("message");

        List<Map<String, Object>> canalMsgPojos = (List<Map<String, Object>>) JSON.parse(message);
```

编写Flink代码，对数据进行处理操作

```
        for (Map<String, Object> canalMsg : canalMsgPojos) {
            String type = (String) canalMsg.get("type");
            if ("INSERT".equals(type)) {
                String tableName = (String) canalMsg.get("table");
                if("web_chat_ems".equals(tableName)){
                    List<Map<String, String>> rowMap = (List<Map<String, String>>) canalMsg.get("data");
                    WebChatEms webChatEms = new WebChatEms();
                    for (Map<String, String> colAndVal : rowMap) {
                        String columnName = colAndVal.get("columnName");
                        String columnValue = colAndVal.get("columnValue");
                        if("id".equals(columnName))  webChatEms.setId(Integer.parseInt(columnValue));
                        if("create_time".equals(columnName)) webChatEms.setCreate_time(columnValue);
                        if("area".equals(columnName)) webChatEms.setArea(columnValue);
                        if("origin_channel".equals(columnName)) webChatEms.setOrigin_channel(columnValue);
                        if("seo_source".equals(columnName)) webChatEms.setSeo_source(columnValue);
                        if("sid".equals(columnName)) webChatEms.setSid(columnValue);
                        if("session_id".equals(columnName)) webChatEms.setSession_id(columnValue);
                        if("ip".equals(columnName))webChatEms.setIp(columnValue);
                        if("msg_count".equals(columnName) && columnValue != null){
                            webChatEms.setMsg_count(Integer.parseInt(columnValue));
                        }
                    }
                    collector.collect(webChatEms);
                }
            }
        } }
    });
```

编写Flink代码，对数据进行处理操作

- 4- 获取其中Data数据: 先获取webChatTextEms核心字段数据

```
    SingleOutputStreamOperator<WebChatTextEms> webChatTextEmsDataStream = filterDataStream.flatMap(new FlatMapFunction<String,
WebChatTextEms>() {
        @Override
        public void flatMap(String canalJson, Collector<WebChatTextEms> collector) throws Exception {
            Map<String, Object> msgMap = JSONObject.parseObject(canalJson, Map.class);
            String message = (String) msgMap.get("message");
            List<Map<String, Object>> canalMsgPojos = (List<Map<String, Object>>) JSON.parse(message);
            for (Map<String, Object> canalMsg : canalMsgPojos) {
                String type = (String) canalMsg.get("type");
                if ("INSERT".equals(type)) {
                    String tableName = (String) canalMsg.get("table");
                    if("web_chat_text_ems".equals(tableName)){
                        List<Map<String, String>> rowMap = (List<Map<String, String>>) canalMsg.get("data");
                        WebChatTextEms webChatTextEms = new WebChatTextEms();
                        for (Map<String, String> colAndVal : rowMap) {
                            String columnName = colAndVal.get("columnName");
                            String columnValue = colAndVal.get("columnValue");
                            if("id".equals(columnName))webChatTextEms.setId(Integer.parseInt(columnValue));
                            if("from_url".equals(columnName))webChatTextEms.setFrom_url(columnValue);
                        }
                        collector.collect(webChatTextEms);
                    }
            }}}
    });
```

编写Flink代码，对数据进行处理操作

- 5- 转换为Flink Sql API准备对数据处理

```
Schema webChatEmsSchema = Schema.newBuilder()
        .column("id", DataTypes.INT())
        .column("session_id", DataTypes.STRING())
        .column("sid", DataTypes.STRING())
        .column("create_time", DataTypes.STRING())
        .column("seo_source", DataTypes.STRING())
        .column("ip", DataTypes.STRING())
        .column("area", DataTypes.STRING())
        .column("origin_channel", DataTypes.STRING())
        .column("msg_count", DataTypes.INT())
        .build();

tableEnv.createTemporaryView("web_chat_ems",webChatEmsDataStream,webChatEmsSchema);

Schema webChatTextEmsSchema = Schema.newBuilder()
        .column("id", DataTypes.INT())
        .column("from_url", DataTypes.STRING())
        .build();

tableEnv.createTemporaryView("web_chat_text_ems",webChatTextEmsDataStream,webChatTextEmsSchema);
```

编写Flink代码，对数据进行处理操作

● 6- 编写SQL进行数据转换合并拉宽数据

```
        //3.4: 进行数据合并拉宽转换操作
        Table table = tableEnv.sqlQuery("select wce.id,wce.sid,wce.ip,wce.session_id,wce.create_time,year(wce.create_time) as
yearInfo,month(wce.create_time) as monthInfo,day(wce.create_time) as dayInfo,hour(wce.create_time) as
hourInfo,wce.seo_source,wce.area,wce.origin_channel,wce.msg_count,wcte.from_url from web_chat_ems wce join web_chat_text_ems wcte on
wce.id = wcte.id");
```

● 7- 将Table转换DS, 对数据进行处理, 准备进行写回Pulsar处理

```
//3.5: 转换为DS 准备输出操作
        DataStream<Row> rowDataStream = tableEnv.toDataStream(table);
        SingleOutputStreamOperator<PulsarTopicPojo> pulsarTopicDataStream = rowDataStream.map(new MapFunction<Row, PulsarTopicPojo>() {
            @Override
            public PulsarTopicPojo map(Row row) throws Exception {
                Integer id = (Integer) row.getField("id");
                String sid = (String) row.getField("sid");
                String ip = (String) row.getField("ip");
                String session_id = (String) row.getField("session_id");
                String create_time = (String) row.getField("create_time");
                String yearInfo = (String) row.getField("yearInfo");
                String monthInfo = (String) row.getField("monthInfo");
                String dayInfo = (String) row.getField("dayInfo");
                String hourInfo = (String) row.getField("hourInfo");
```

编写Flink代码，对数据进行处理操作

```
            String seo_source = (String) row.getField("seo_source");
            String area = (String) row.getField("area");
            String origin_channel = (String) row.getField("origin_channel");
            Integer msg_count = (Integer) row.getField("msg_count");
            String from_url = (String) row.getField("from_url");
            pulsarTopicPojo.setData(id, sid, ip, session_id, create_time,yearInfo, monthInfo, dayInfo, hourInfo, seo_source, area, origin_channel,
msg_count, from_url);
            return pulsarTopicPojo;
        }
    });
```

- 8- 设置sink, 将数据写出到Pulsar: Pulsar Connector Flink Sink

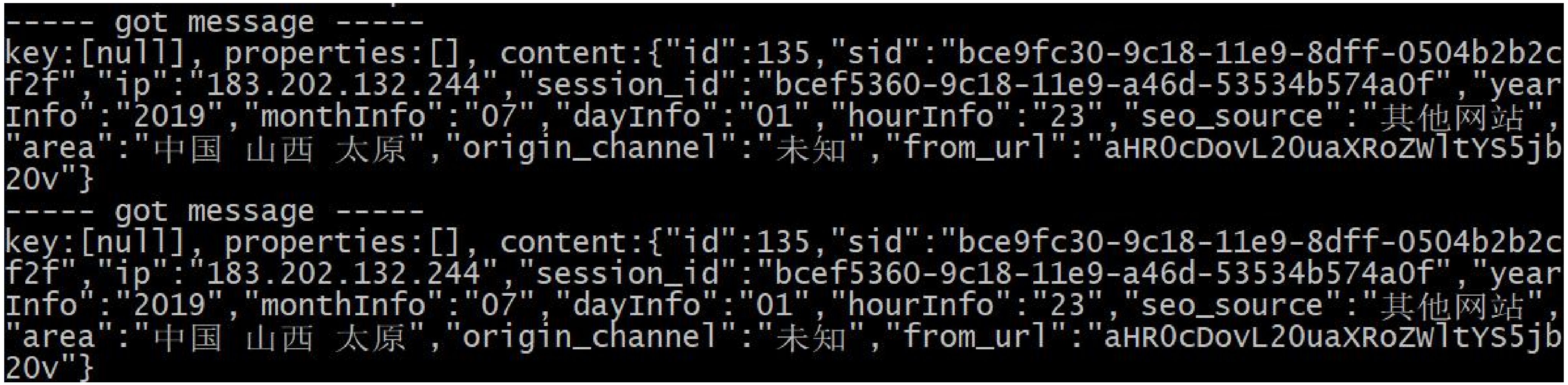
```
    //3.6: 设置sink 进行数据输出操作
    PulsarSerializationSchemaWrapper<PulsarTopicPojo> pulsarSerialization = new
PulsarSerializationSchemaWrapper.Builder<>(JsonSer.of(PulsarTopicPojo.class))
            .usePojoMode(PulsarTopicPojo.class, RecordSchemaType.JSON) .build();
    FlinkPulsarSink<PulsarTopicPojo> pulsarSink = new FlinkPulsarSink<>(
            "pulsar://node1:6650,node2:6650,node3:6650", "http://node1:8080,node2:8080,node3:8080",
            Optional.of("persistent://public/default/itcast_ems_tab"), new Properties(),
            pulsarSerialization
    );
    pulsarTopicDataStream.addSink(pulsarSink);
    //4. 执行启动
    env.execute("itcast_ems");
  }
}
```

测试数据是否可以正常写回到Pulsar

- 1- 启动一个消费者, 用于接收消息

```
cd /export/server/pulsar_2.8.1/
./bin/pulsar-client consume -s 'itcast_test01' -n 0 itcast_ems_tab
```

- 2- 启动Flink程序: 并通过mysql向两个表写入数据, 观察消费者是否可以正常输出数据



```
----- got message -----
key:[null], properties:[], content:{"id":135,"sid":"bce9fc30-9c18-11e9-8dff-0504b2b2c
f2f","ip":"183.202.132.244","session_id":"bcef5360-9c18-11e9-a46d-53534b574a0f","year
Info":"2019","monthInfo":"07","dayInfo":"01","hourInfo":"23","seo_source":"其他网站",
"area":"中国 山西 太原","origin_channel":"未知","from_url":"aHR0cDovL20uaXRoZWltYS5jb
20v"}
----- got message -----
key:[null], properties:[], content:{"id":135,"sid":"bce9fc30-9c18-11e9-8dff-0504b2b2c
f2f","ip":"183.202.132.244","session_id":"bcef5360-9c18-11e9-a46d-53534b574a0f","year
Info":"2019","monthInfo":"07","dayInfo":"01","hourInfo":"23","seo_source":"其他网站",
"area":"中国 山西 太原","origin_channel":"未知","from_url":"aHR0cDovL20uaXRoZWltYS5jb
20v"}
```

06 基于Flink将数据写入到HBase

编写Flink完成数据写入到Hbase操作，完成数据备份，便于后续进行即席查询和离线分析

HBase基本介绍

hbase是基于Google发布bigTable论文产生一款软件，是一款noSQL型数据，不支持SQL. 不支持join的操作，没有表关系，不支持事务(多行事务),hbase是基于 HDFS的采用java 语言编写

查询hbase数据一般有三种方案(主键(row key)查询，主键的范围检索,查询全部数据)

都是以字节类型存储，存储结构化和半结构化数据

hbase表的特点：大   面向列的存储方案 稀疏性

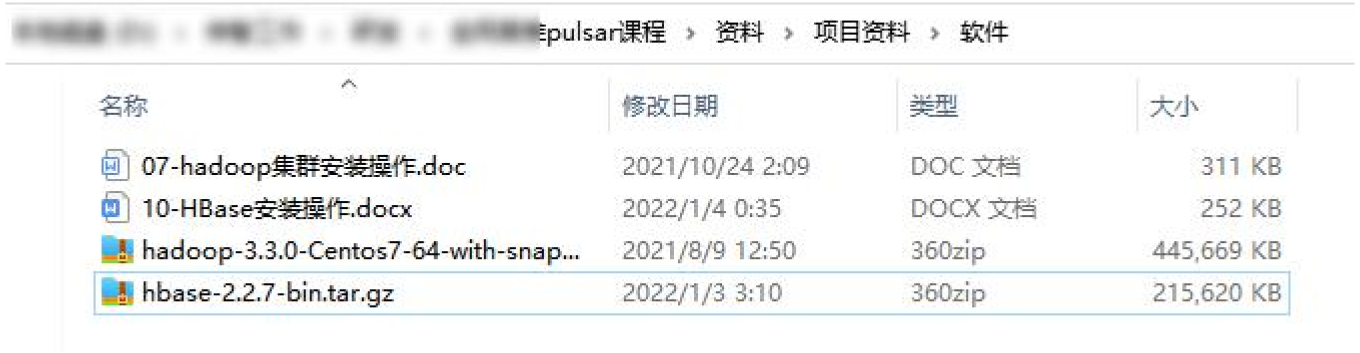
应用场景

- 1）需要进行随机读写的操作
- 2）数据量比较大
- 3）数据比较稀疏

编写Flink完成数据写入到Hbase操作，完成数据备份，便于后续进行即席查询和离线分析

HBase安装操作

本次安装的HBase为2.2.7,详细的安装手册大家可以参考资料，还需要大家注意,HBase的启动需要依赖于zookeeper和HDFS的，顾需要先安装 HADOOP与zookeeper



pulsar课程 › 资料 › 项目资料 › 软件

名称	修改日期	类型	大小
07-hadoop集群安装操作.doc	2021/10/24 2:09	DOC 文档	311 KB
10-HBase安装操作.docx	2022/1/4 0:35	DOCX 文档	252 KB
hadoop-3.3.0-Centos7-64-with-snap...	2021/8/9 12:50	360zip	445,669 KB
hbase-2.2.7-bin.tar.gz	2022/1/3 3:10	360zip	215,620 KB

编写Flink完成数据写入到Hbase操作，完成数据备份，便于后续进行即席查询和离线分析

- 1- 在Hbase中创建目标表

```
create 'itcast_h_ems, {NAME=>'f1',COMPRESSION=>'GZ'},{NUMREGIONS=>6, SPLITALGO=>'HexStringSplit'}
```

- 2- 编写Flink代码完成写入Hbase操作

```
// 将数据写入到Hbase中
public class ItcastFlinkToHbase {
    public static void main(String[] args) {
        //1. 创建Flink流式处理的核心环境类对象
        StreamExecutionEnvironment env = StreamExecutionEnvironment.getExecutionEnvironment();
        StreamTableEnvironment tableEnv = StreamTableEnvironment.create(env);
        //2. 添加source组件: 从Pulsar中读取数据
        Properties props = new Properties();
        props.setProperty("topic","persistent://public/default/itcast_ems_tab");
        FlinkPulsarSource<PulsarTopicPojo> pulsarSource = new FlinkPulsarSource<>(
                "pulsar://node1:6650,node2:6650,node3:6650",
                "http://node1:8080,node2:8080,node3:8080",
                JsonDeser.of(PulsarTopicPojo.class),
                props
        );
        DataStreamSource<PulsarTopicPojo> streamSource = env.addSource(pulsarSource);
```

编写Flink完成数据写入到Hbase操作，完成数据备份，便于后续进行即席查询和离线分析

```
        //3. 转换为Flink Table
        Schema schema = Schema.newBuilder()
                .column("id", DataTypes.INT()).column("sid", DataTypes.STRING())
                .column("ip", DataTypes.STRING()) .column("session_id", DataTypes.STRING())
                .column("create_time", DataTypes.STRING()).column("yearInfo", DataTypes.STRING())
                .column("monthInfo", DataTypes.STRING()).column("dayInfo", DataTypes.STRING())
                .column("hourInfo", DataTypes.STRING()).column("seo_source", DataTypes.STRING())
                .column("area", DataTypes.STRING()).column("origin_channel", DataTypes.STRING())
                .column("msg_count", DataTypes.INT()).column("from_url", DataTypes.STRING())
                .build();
        tableEnv.createTemporaryView("itcast_ems",streamSource,schema);
        //4, 定义Hbase的表
        String hTable = "CREATE  TABLE itcast_h_ems (" +
                " rowkey INT," +
                " f1 ROW<sid STRING,ip STRING,session_id STRING,create_time STRING,yearInfo STRING,monthInfo STRING,dayInfo STRING,hourInfo 
STRING,seo_source STRING,area STRING,origin_channel STRING,msg_count INT,from_url STRING>," +
                " PRIMARY KEY (rowkey) NOT ENFORCED" +
                ") WITH (" +
                " 'connector' = 'hbase-2.2'," +
                " 'table-name' = 'itcast_h_ems'," +
                " 'zookeeper.quorum' = 'node1:2181,node2:2181,node3:2181'" +
                ")";
        tableEnv.executeSql(hTable);
        tableEnv.executeSql("insert into itcast_h_ems select 
id,ROW(sid,ip,session_id,create_time,yearInfo,monthInfo,dayInfo,hourInfo,seo_source,area,origin_channel,msg_count,from_url) from itcast_ems");
    }
}
```

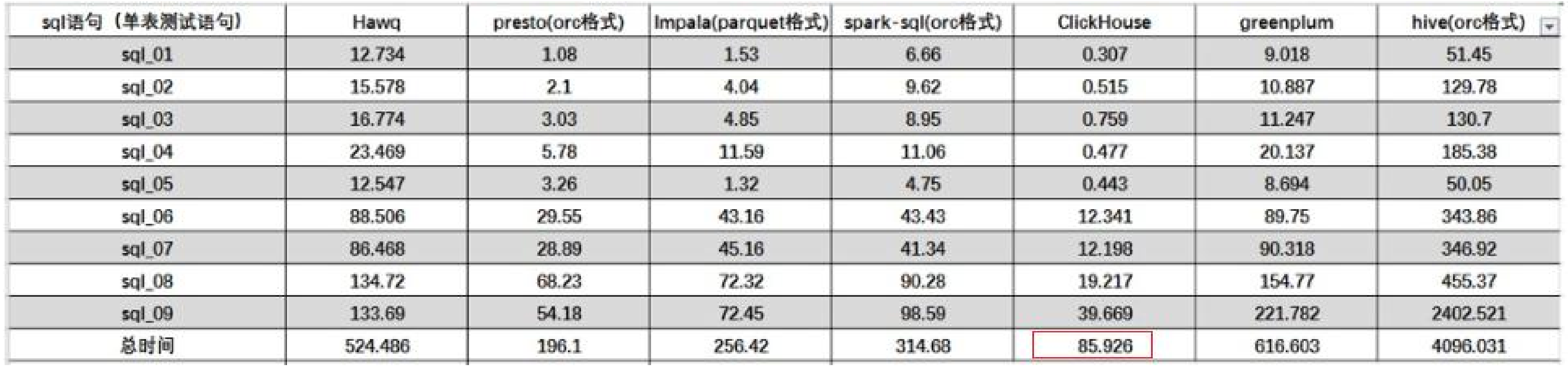
07

基于Flink将数据写入到ClickHouse

编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

ClickHouse基本介绍

ClickHouse 是俄罗斯的Yandex于2016年开源的列式存储数据库（DBMS），使用C++语言编写，主要用于在线分析处理查询（OLAP），能够使用SQL查询实时生成分析数据报告。



sql语句（单表测试语句）	Hawq	presto(orc格式)	Impala(parquet格式)	spark-sql(orc格式)	ClickHouse	greenplum	hive(orc格式)
sql_01	12.734	1.08	1.53	6.66	0.307	9.018	51.45
sql_02	15.578	2.1	4.04	9.62	0.515	10.887	129.78
sql_03	16.774	3.03	4.85	8.95	0.759	11.247	130.7
sql_04	23.469	5.78	11.59	11.06	0.477	20.137	185.38
sql_05	12.547	3.26	1.32	4.75	0.443	8.694	50.05
sql_06	88.506	29.55	43.16	43.43	12.341	89.75	343.86
sql_07	86.468	28.89	45.16	41.34	12.198	90.318	346.92
sql_08	134.72	68.23	72.32	90.28	19.217	154.77	455.37
sql_09	133.69	54.18	72.45	98.59	39.669	221.782	2402.521
总时间	524.486	196.1	256.42	314.68	85.926	616.603	4096.031

结论：ClickHouse像很多OLAP数据库一样，单表查询速度由于关联查询，而且ClickHouse的两者差距更为明显。

编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

ClickHouse安装步骤

本项目中,我们仅需要安装单机测试版本即可使用(node2安装)，在实际生产中，大家可以直接将分布式集群版本

- 1- 设置yum源

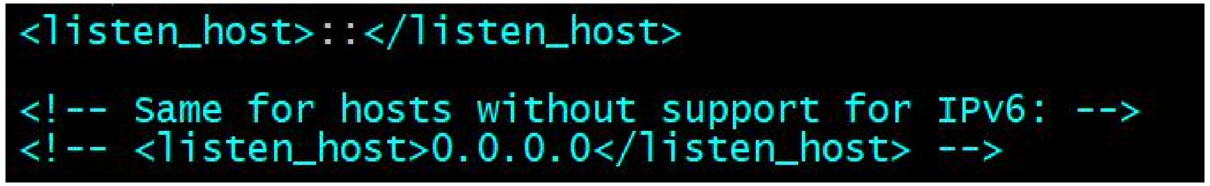
```
sudo yum install yum-utils
sudo rpm --import https://repo.clickhouse.com/CLICKHOUSE-KEY.GPG
sudo yum-config-manager --add-repo https://repo.clickhouse.com/rpm/stable/x86_64
```

- 2- 直接基于yum安装即可

```
sudo yum install clickhouse-server clickhouse-client
```

- 3- 修改配置文件

```
vim /etc/clickhouse-server/config.xml

修改178行: 打开这一行的注释
<listen_host>::</listen_host>
```



```
<listen_host>::</listen_host>

<!-- Same for hosts without support for IPv6: -->
<!-- <listen_host>0.0.0.0</listen_host> -->
```

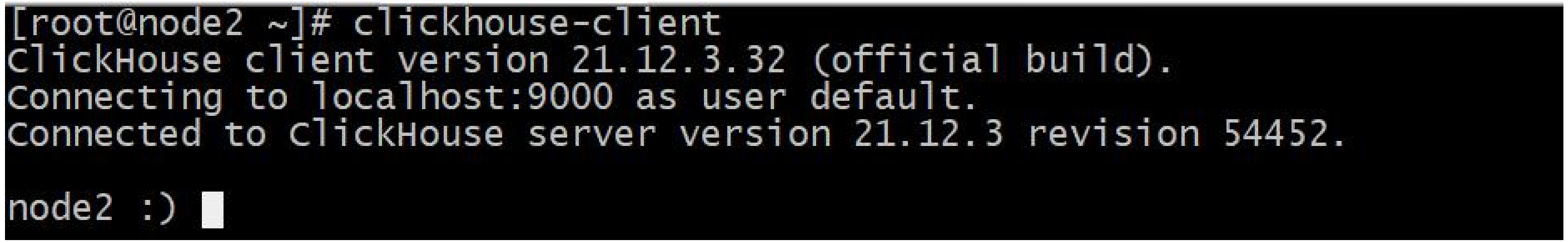
编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

ClickHouse安装步骤

- 4- 启动clickhouse的server

```
启动服务
    systemctl start clickhouse-server

停止:
    systemctl stop clickhouse-server

重启
   systemctl restart clickhouse-server
```

- 5- 进入客户端



```
[root@node2 ~]# clickhouse-client
ClickHouse client version 21.12.3.32 (official build).
Connecting to localhost:9000 as user default.
Connected to ClickHouse server version 21.12.3 revision 54452.

node2 :) 
```

编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

- 1- 在ClickHouse中创建目标表

```
create database itcast_ck;
use  itcast_ck;
create table itcast_ck.itcast_ck_ems(
   id int,
   sid varchar(128),
   ip varchar(128),
   create_time varchar(128),
   session_id varchar(128),
   yearInfo varchar(128),
   monthInfo varchar(128),
   dayInfo varchar(128),
   hourInfo varchar(128),
   seo_source varchar(128),
   area varchar(128),
   origin_channel varchar(128),
   msg_count int(128),
   from_url varchar(128),
   PRIMARY KEY (`id`)
) ENGINE=ReplacingMergeTree() ;
```

编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

- 2- 编写Flink代码完成写入到CK操作

```
// 将数据写入到CK中
public class ItcastFlinkToCK {

    public static void main(String[] args) throws Exception {

        //1. 创建Flink流式处理的核心环境类对象
        StreamExecutionEnvironment env = StreamExecutionEnvironment.getExecutionEnvironment();
        //2. 添加source组件: 从Pulsar中读取数据
        Properties props = new Properties();
        props.setProperty("topic","persistent://public/default/itcast_ems_tab");
        FlinkPulsarSource<PulsarTopicPojo> pulsarSource = new FlinkPulsarSource<>(
                "pulsar://node1:6650,node2:6650,node3:6650",
                "http://node1:8080,node2:8080,node3:8080",
                JsonDeser.of(PulsarTopicPojo.class),
                props
        );
        DataStreamSource<PulsarTopicPojo> streamSource = env.addSource(pulsarSource);
```

编写Flink完成数据写入到ClickHouse操作，后续基于CK完成指标统计操作

```
    //3. 转换数据
    SingleOutputStreamOperator<Row> rowDS = streamSource.map(new MapFunction<PulsarTopicPojo, Row>() {
      @Override
      public Row map(PulsarTopicPojo pulsarTopicPojo) throws Exception {
        return Row.of(
                pulsarTopicPojo.getId(), pulsarTopicPojo.getSid(),pulsarTopicPojo.getIp(),
pulsarTopicPojo.getSession_id(),pulsarTopicPojo.getCreate_time(),pulsarTopicPojo.getYearInfo(),
pulsarTopicPojo.getMonthInfo(),pulsarTopicPojo.getDayInfo(), pulsarTopicPojo.getHourInfo(),pulsarTopicPojo.getSeo_source(),
pulsarTopicPojo.getArea(),pulsarTopicPojo.getOrigin_channel(), pulsarTopicPojo.getMsg_count(),pulsarTopicPojo.getFrom_url());
      }
    });
    //4.执行写入CK
    String insertSql = "INSERT INTO itcast_ck.itcast_ck_ems
(id,sid,ip,session_id,yearInfo,monthInfo,dayInfo,hourInfo,seo_source,area,origin_channel,msg_count,from_url) values(?,?,?,?,?,?,?,?,?,?,?,?,?)";
    JDBCAppendTableSink tableSink = JDBCAppendTableSink.builder()
        .setDrivername("ru.yandex.clickhouse.ClickHouseDriver")
        .setDBUrl("jdbc:clickhouse://node2:8123/itcast_ck").setQuery(insertSql).setBatchSize(1)
        .setParameterTypes(Types.INTEGER,Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,
Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,Types.VARCHAR,Types.INTEGER,Types.VARCHAR).build();
    tableSink.emitDataStream(rowDS);
    env.execute("itcast_to_ck");
  }
}
```

08 HBase对接Phoenix实现即席查询

Phoenix安装操作

Phoenix是属于apache旗下的一款基于hbase的工具， 此工具提供一种全新的方式来操作hbase中数据(SQL)，同时Phoenix对hbase进行大量的优化工作，能够让我们更加有效的操作hbase

整个安装操作，大家可以参考资料中安装手册，进行安装即可

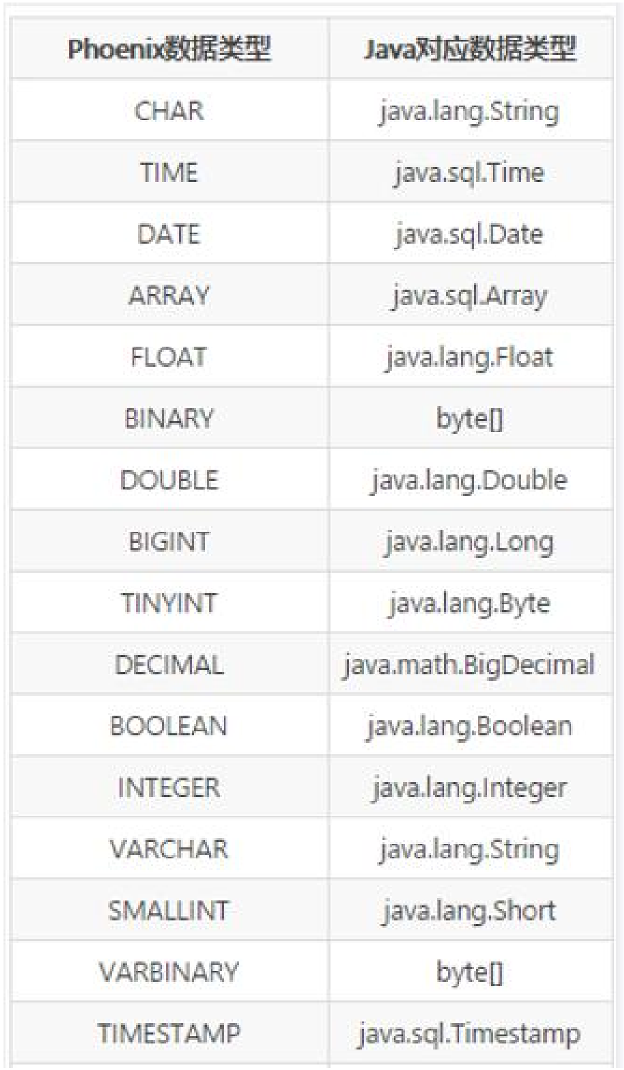
Phoenix对接HBase完成即席查询

- 1- 在Phoenix中创建表

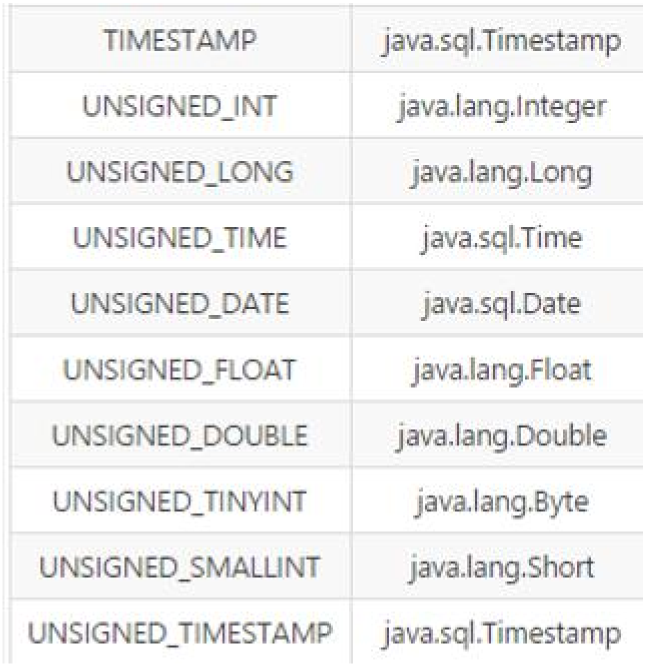
```
create view "itcast_h_ems" (
   "id" integer primary key,
   "f1"."sid" varchar,
   "f1"."ip" varchar,
   "f1"."create_time" varchar,
   "f1"."session_id" varchar,
   "f1"."yearInfo" varchar,
   "f1"."monthInfo" varchar,
   "f1"."dayInfo" varchar,
   "f1"."hourInfo" varchar,
   "f1"."seo_source" varchar,
   "f1"."area" varchar,
   "f1"."origin_channel" varchar,
   "f1"."msg_count" integer,
   "f1"."from_url" varchar
  );
```

Phoenix对接HBase完成即席查询

- 在Phoenix中类型说明



Phoenix数据类型	Java对应数据类型
CHAR	java.lang.String
TIME	java.sql.Time
DATE	java.sql.Date
ARRAY	java.sql.Array
FLOAT	java.lang.Float
BINARY	byte[]
DOUBLE	java.lang.Double
BIGINT	java.lang.Long
TINYINT	java.lang.Byte
DECIMAL	java.math.BigDecimal
BOOLEAN	java.lang.Boolean
INTEGER	java.lang.Integer
VARCHAR	java.lang.String
SMALLINT	java.lang.Short
VARBINARY	byte[]
TIMESTAMP	java.sql.Timestamp



TIMESTAMP	java.sql.Timestamp
UNSIGNED_INT	java.lang.Integer
UNSIGNED_LONG	java.lang.Long
UNSIGNED_TIME	java.sql.Time
UNSIGNED_DATE	java.sql.Date
UNSIGNED_FLOAT	java.lang.Float
UNSIGNED_DOUBLE	java.lang.Double
UNSIGNED_TINYINT	java.lang.Byte
UNSIGNED_SMALLINT	java.lang.Short
UNSIGNED_TIMESTAMP	java.sql.Timestamp

09 HBase对接HIVE完成离线统计分析

Stream Native

黑马程序员 www.itheima.com 传智教育旗下 高端IT教育品牌

PULSAR

HIVE基本介绍

hive是一款基于hadoop的数据仓库工具, 那么也就意味如果要启动hive, 必须先启动好hadoop, 最初由Facebook开发, 后期贡献给apache. 成为了apache的顶级项目

hive的作用 ， 可以将结构化的数据文件映射为一张数据库表，并提供类SQL查询功能。

hive本质上就是一款翻译软件, 主要用于将用户输入的SQL, 编译为MapReduce, 运行在yarn平台之上, 数据来源于HDFS

HIVE安装操作

HIVE安装操作大家可参考资料中安装手册即可

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- HIVE中创建表

```
create database itcast_edu;
create external table itcast_edu.itcast_h_ems_ods (
   id int,sid string,ip string,session_id string,create_time string,
   yearInfo string,monthInfo string,dayInfo string,hourInfo string,
   seo_source string,area string,origin_channel string,msg_count int,from_url string
)
stored by 'org.apache.hadoop.hive.hbase.HBaseStorageHandler'
with serdeproperties('hbase.columns.mapping'=':key#b,
f1:sid,
f1:ip,
f1:session_id,
f1:create_time,
f1:yearInfo,
f1:monthInfo,
f1:dayInfo,
f1:hourInfo,
f1:seo_source,
f1:area,
f1:origin_channel,
f1:msg_count#b,
f1:from_url') tblproperties('hbase.table.name'='itcast_h_ems');
```

HIVE集成HBase， 完成与HIVE对接，基于HIVE进行离线分析

业务需求:

1. 总访问客户量
2. 地区独立访客
3. 访客咨询率 ： 咨询率=发起咨询的人数/访问客户量
4. 客户访问量和访客咨询率趋势
5. 各时间段访问客户量
6. 各来源渠道/各搜索来源访问量
7. 活跃页面TOP10

维度:

日期: 截止到上一天的每小时,每天,每月, 每年

地区、来源渠道、搜索来源、受访页面

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

流程分析：

1- 构建DW层表，用于存储上一天及以前的数据

2- 构建RPT层，用于存储分析的结果

3- 对DW层的表进行统计分析，将统计分析的结果保存到RPT层

需求分析：

1- 抽取对接Phoenix的HIVE表上一天的数据到DW层，如果是第一次抽取，抽取截止上一天的全部

此表与对接Phoenix的HIVE表的字段保持一致即可

2- RPT层构建为两个表，分别用于保存访问量和咨询量

访问量的RPT表：total_visit,yearinfo,monthinfo,dayinfo,hourinfo,area,origin_channel,seo_source,from_url,time_type,group_type

咨询量的RPT表：total_consult,yearinfo,monthinfo,dayinfo,hourinfo,area,origin_channel,time_type,group_type

3- 在DW层基于各个维度完成统计操作

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 1-构建DW层表

```
create table itcast_edu.itcast_h_ems_dw(
   sid string,
   ip string,
   session_id string,
   hourInfo string,
   seo_source string,
   area string,
   origin_channel string,
   msg_count int,
   from_url string
)
COMMENT 'DW宽表'
PARTITIONED BY (yearinfo string, monthinfo STRING, dayinfo string)
ROW FORMAT DELIMITED FIELDS TERMINATED BY '\t'
STORED AS ORC
LOCATION '/user/hive/warehouse/itcast_edu.db/itcast_h_ems_dw'
TBLPROPERTIES ('orc.compress'='SNAPPY');
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 2-构建RPT层表 -- 访问量RPT表

```
CREATE TABLE IF NOT EXISTS  itcast_edu.itcast_h_ems_visit_rpt (
  total_visit INT COMMENT '根据sid去重求count',
  area STRING COMMENT '区域信息',
  seo_source STRING COMMENT '搜索来源',
  origin_channel STRING COMMENT '来源渠道',
  hourinfo STRING COMMENT '创建时间，统计至小时',
  time_str STRING COMMENT '时间明细',
  from_url STRING comment '会话来源页面',
  groupType STRING COMMENT '产品属性类型：1.地区；2.搜索来源；3.来源渠道；4.会话来源页面；5.总访问量',
  time_type STRING COMMENT '时间聚合类型：1、按小时聚合；2、按天聚合；3、按月聚合；4、按年聚合；')
comment 'EMS访客日志RPT表'
PARTITIONED BY(yearinfo STRING,monthinfo STRING,dayinfo STRING)
ROW FORMAT DELIMITED
FIELDS TERMINATED BY '\t'
stored as orc
location '/user/hive/warehouse/itcast_edu.db/itcast_h_ems_visit_rpt'
TBLPROPERTIES ('orc.compress'='SNAPPY');
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 3-构建RPT层表 -- 咨询量RPT表

```
CREATE TABLE IF NOT EXISTS itcast_edu.itcast_h_ems_consult_rpt (
  total_consult INT COMMENT '根据sid去重求count',
  area STRING COMMENT '区域信息',
  origin_channel STRING COMMENT '来源渠道',
  hourinfo STRING COMMENT '创建时间，统计至小时',
  time_str STRING COMMENT '时间明细',
  groupType STRING COMMENT '产品属性类型：1.地区；2.来源渠道',3.总咨询量
  time_type STRING COMMENT '时间聚合类型：1、按小时聚合；2、按天聚合；3、按月聚合；4、按年聚合；'
)
COMMENT '咨询量RPT宽表'
PARTITIONED BY (yearinfo string, monthinfo STRING, dayinfo string)
ROW FORMAT DELIMITED FIELDS TERMINATED BY '\t'
STORED AS ORC
LOCATION '/user/hive/warehouse/itcast_dws.db/consult_dws'
TBLPROPERTIES ('orc.compress'='SNAPPY');
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 4-DW层:全量采集

```
--分区
SET hive.exec.dynamic.partition=true;
SET hive.exec.dynamic.partition.mode=nonstrict;
--hive压缩
set hive.exec.compress.intermediate=true;
set hive.exec.compress.output=true;
--写入时压缩生效
set hive.exec.orc.compression.strategy=COMPRESSION;
-- 全量采集: 截止上一天的数据
insert into table itcast_edu.itcast_h_ems_dw partition(yearinfo,monthinfo,dayinfo)
select
    sid,
    ip,
    session_id,
    hourinfo,
    seo_source,
    area,
    origin_channel,
    msg_count,
    from_url ,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_ods where substr(create_time ,1,10) < '2021-01-03' ;
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 4-DW层:增量抽取上一天的数据

```
-- 全量采集: 截止上一天的数据
insert into table itcast_edu.itcast_h_ems_dw  partition(yearinfo,monthinfo,dayinfo)
select
    sid,
    ip,
    session_id,
    hourinfo,
    seo_source,
    area,
    origin_channel,
    msg_count,
    from_url ,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_ods where substr(create_time ,1,10) = ’2021-01-04’ ;
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期 统计总访问量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '-1' as from_url,
    '5' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,hourinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

● 5-RPT层:基于 日期 统计总访问量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '5' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期 统计总访问量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    '-1' as from_url,
    '5' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期 统计总访问量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    ‘-1’ as area,
    ‘-1’ as seo_source,
    ‘-1’ as origin_channel,
    ‘-1’ as hourinfo,
    yearinfo as time_str,
    ‘-1’ as from_url,
    ‘5’ as grouptype,
    ‘4’ as time_type,
    yearinfo,
    ‘-1’ as monthinfo,
    ‘-1’ as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总访问量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,hourinfo,area
```

HIVE集成HBase, 完成与HIVE对接, 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总访问量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总访问量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总访问量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    area,
    ‘-1’ as seo_source,
    ‘-1’ as origin_channel,
    ‘-1’ as hourinfo,
    yearinfo as time_str,
    ‘-1’ as from_url,
    ‘1’ as grouptype,
    ‘4’ as time_type,
    yearinfo,
    ‘-1’ as monthinfo,
    ‘-1’ as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+搜索来源 统计总访问量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    seo_source,
    '-1' as origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '-1' as from_url,
    '2' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,hourinfo,seo_source
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+搜索来源 统计总访问量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '2' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,seo_source
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+搜索来源 统计总访问量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    '-1' as from_url,
    '2' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,seo_source
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+搜索来源 统计总访问量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    yearinfo as time_str,
    '-1' as from_url,
    '2' as grouptype,
    '4' as time_type,
    yearinfo,
    '-1' as monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,seo_source
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总访问量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '-1' as from_url,
    '3' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,hourinfo,origin_channel
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总访问量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '3' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,origin_channel
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总访问量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    ‘-1’ as area,
    ‘-1’ as seo_source,
    origin_channel,
    ‘-1’ as hourinfo,
    concat(yearinfo,’-’,monthinfo) as time_str,
    ‘-1’ as from_url,
    ‘3’ as grouptype,
    ‘3’ as time_type,
    yearinfo,
    monthinfo,
    ‘-1’ as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,origin_channel
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

● 5-RPT层:基于 日期+来源渠道 统计总访问量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    origin_channel,
    '-1' as hourinfo,
    yearinfo as time_str,
    '-1' as from_url,
    '3' as grouptype,
    '4' as time_type,
    yearinfo,
    '-1' as monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,origin_channel
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+受访页面 统计总访问量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    ‘-1’ as area,
    ‘-1’ as seo_source,
    ‘-1’ as origin_channel,
    hourinfo,
    concat(yearinfo,’-’,monthinfo,’-’,dayinfo,’ ’,hourinfo) as time_str,
    from_url,
    ‘4’ as grouptype,
    ‘1’ as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,hourinfo,from_url
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

● 5-RPT层:基于 日期+受访页面 统计总访问量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    from_url,
    '4' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,dayinfo,from_url
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+受访页面 统计总访问量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    from_url,
    '4' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,monthinfo,from_url
```

HIVE集成HBase， 完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+受访页面 统计总访问量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_visit_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    yearinfo as time_str,
    from_url,
    '4' as grouptype,
    '4' as time_type,
    yearinfo,
    '-1' as monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw group by yearinfo,from_url
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 6-RPT层:基于 日期 统计咨询量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    ‘-1’ as area,
    ‘-1’ as seo_source,
    ‘-1’ as origin_channel,
    hourinfo,
    concat(yearinfo,’-’,monthinfo,’-’,dayinfo,’ ’,hourinfo) as time_str,
    ‘-1’ as from_url,
    ‘3’ as grouptype,
    ‘1’ as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo,hourinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 6-RPT层:基于 日期 统计咨询量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
     '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '3' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 6-RPT层:基于 日期 统计咨询量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    ‘-1’ as area,
    ‘-1’ as seo_source,
    ‘-1’ as origin_channel,
     ‘-1’ as hourinfo,
    concat(yearinfo,’-’,monthinfo) as time_str,
    ‘-1’ as from_url,
    ‘3’ as grouptype,
    ‘3’ as time_type,
    yearinfo,
    monthinfo,
    ‘-1’ as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 6-RPT层:基于 日期 统计咨询量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    '-1' as seo_source,
    '-1' as origin_channel,
     '-1' as hourinfo,
    concat(yearinfo) as time_str,
    '-1' as from_url,
    '3' as grouptype,
    '4' as time_type,
    yearinfo,
    '-1' as monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总咨询量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo,hourinfo,area
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总咨询量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总咨询量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+地区 统计总咨询量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    area,
    '-1' as seo_source,
    '-1' as origin_channel,
    '-1' as hourinfo,
    concat(yearinfo) as time_str,
    '-1' as from_url,
    '1' as grouptype,
    '4' as time_type,
    yearinfo,
   '-1' as monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,area
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总咨询量

```
-- 小时 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    origin_channel,
    hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo,' ',hourinfo) as time_str,
    '2' as grouptype,
    '1' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo,hourinfo,origin_channel
```

HIVE集成HBase， 完成与HIVE对接， 基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总咨询量

```
-- 天 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo,'-',dayinfo) as time_str,
    '2' as grouptype,
    '2' as time_type,
    yearinfo,
    monthinfo,
    dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,dayinfo,origin_channel
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总咨询量

```
-- 月 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    origin_channel,
    '-1' as hourinfo,
    concat(yearinfo,'-',monthinfo) as time_str,
    '2' as grouptype,
    '3' as time_type,
    yearinfo,
    monthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,monthinfo,origin_channel
```

HIVE集成HBase，完成与HIVE对接，基于HIVE进行离线分析

- 5-RPT层:基于 日期+来源渠道 统计总咨询量

```
-- 年 统计
insert into table itcast_edu.itcast_h_ems_consult_rpt partition(yearinfo,monthinfo,dayinfo)
select
    round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_consult,
    '-1' as area,
    origin_channel,
    '-1' as hourinfo,
    concat(yearinfo) as time_str,
    '2' as grouptype,
    '4' as time_type,
    yearinfo,
    '-1' asmonthinfo,
    '-1' as dayinfo
from itcast_edu.itcast_h_ems_dw where msg_count>0  group by yearinfo,origin_channel
```

10 基于clickhouse完成实时数仓分析

基于clickhouse完成实时数仓分析

业务需求:

1. 总访问量
2. 总咨询量
3. 咨询率

维度:

日期: 当天,小时

基于clickhouse完成实时数仓分析

- 1- 统计当天总访问量、总咨询量、咨询率

```
with t1 as (select \
yearInfo,monthInfo,dayInfo,
round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) / 3 ,2) as total_visit, \
round((count(distinct if( msg_count >0,sid,null)) + count(distinct if( msg_count >0,session_id,null)) + count(distinct if( msg_count
>0,ip,null))) / 3 ,2) as total_consult \
from itcast_ck.itcast_ck_ems
where substr(create_time,1,10) = '2022-01-06') \
select total_visit,total_consult ,  round(total_consult/total_visit *100,2)  from t1;
```

- 2- 统计当天，每个小时的总访问量、总咨询量、咨询率

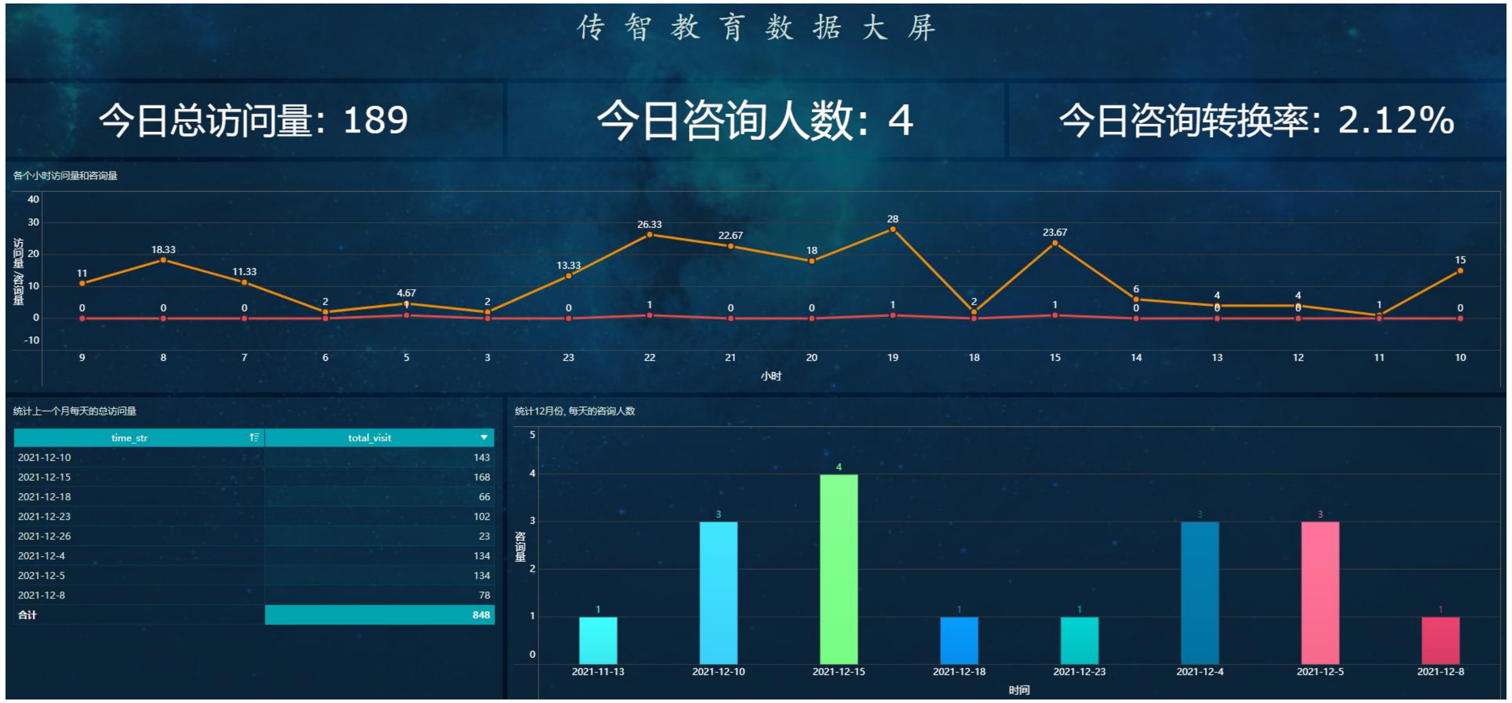
```
with t1 as (
select
        yearinfo,monthinfo,dayinfo,hourinfo
        round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) /3,2) as total_visit,
        round((count(distinct if(msg_count >0 ,sid,null)) + count(distinct if(msg_count >0 ,session_id,null)) + count(distinct
if(msg_count >0 ,ip,null))) /3,2) as total_consult
from itcast_ck.itcast_ck_ems where substr(create_time,1,10) = date(NOW())
group by yearinfo,monthinfo,dayinfo,hourinfo)
select yearinfo, total_visit, total_consult, round(total_consult/total_visit*100,2) from t1
```

11 基于FineBI实现实时报表

基于FineBI实现实时报表

本次我们主要通过帆软公司提供FineBI实现整个实时图表的实现操作，帆软也是国内比较大型一家专门做商业智能BI公司

FineBI如何安装以及如何激活，大家可以直接参考资料提供的安装文档即可，或者也可以直接到帆软官方进行下载安装即可，本次我们就直接使用FineBI即可

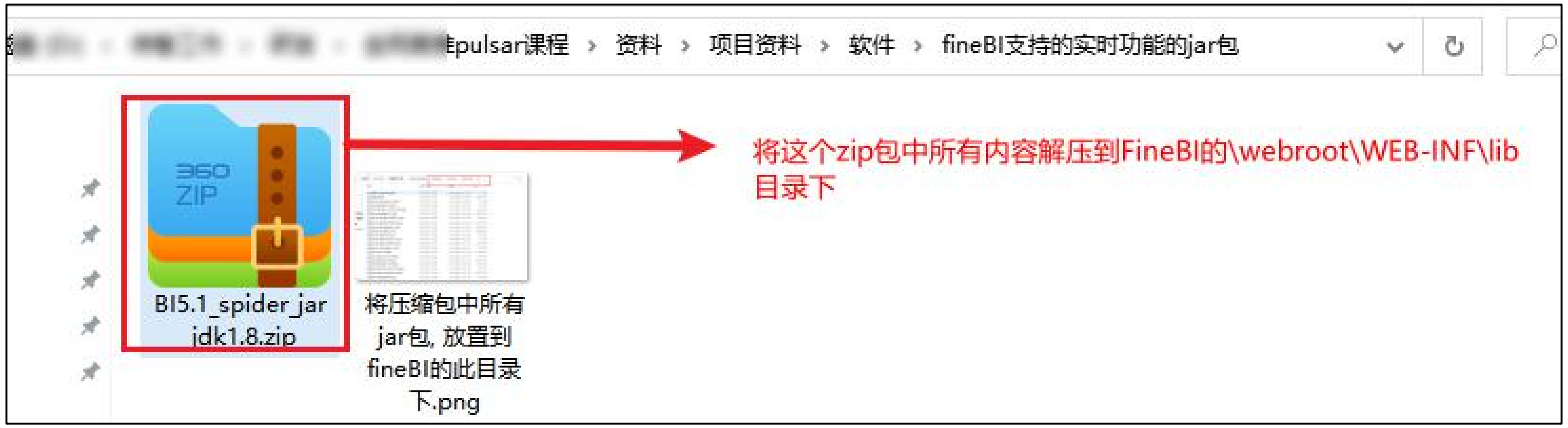


统计上一个月每天的总访问量

time_str	total_visit
2021-12-10	143
2021-12-15	168
2021-12-18	66
2021-12-23	102
2021-12-26	23
2021-12-4	134
2021-12-5	134
2021-12-8	78
合计	848

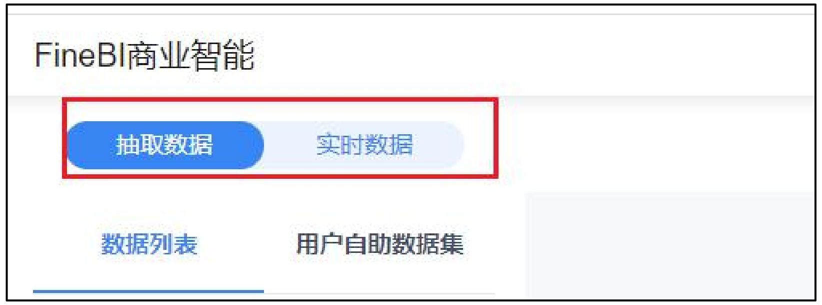
FineBI集成实时功能组件

- 1- 关闭FineBI服务
- 2- 将资料中提供的实时组件的包放置到fineBI的\webroot\WEB-INF\lib目录下


pulsar课程 › 资料 › 项目资料 › 软件 › fineBI支持的实时功能的jar包
BI5.1_spider_jar_jdk1.8.zip
将压缩包中所有jar包, 放置到fineBI的此目录下.png

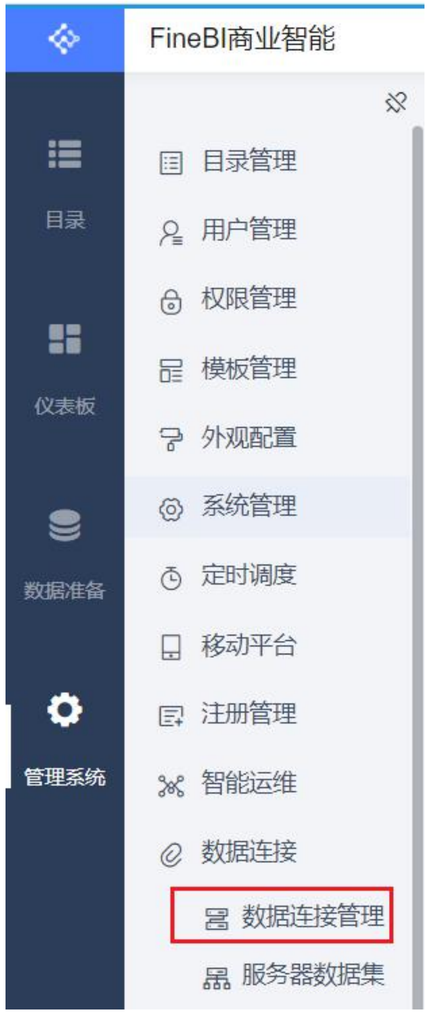
将这个zip包中所有内容解压到FineBI的\webroot\WEB-INF\lib目录下

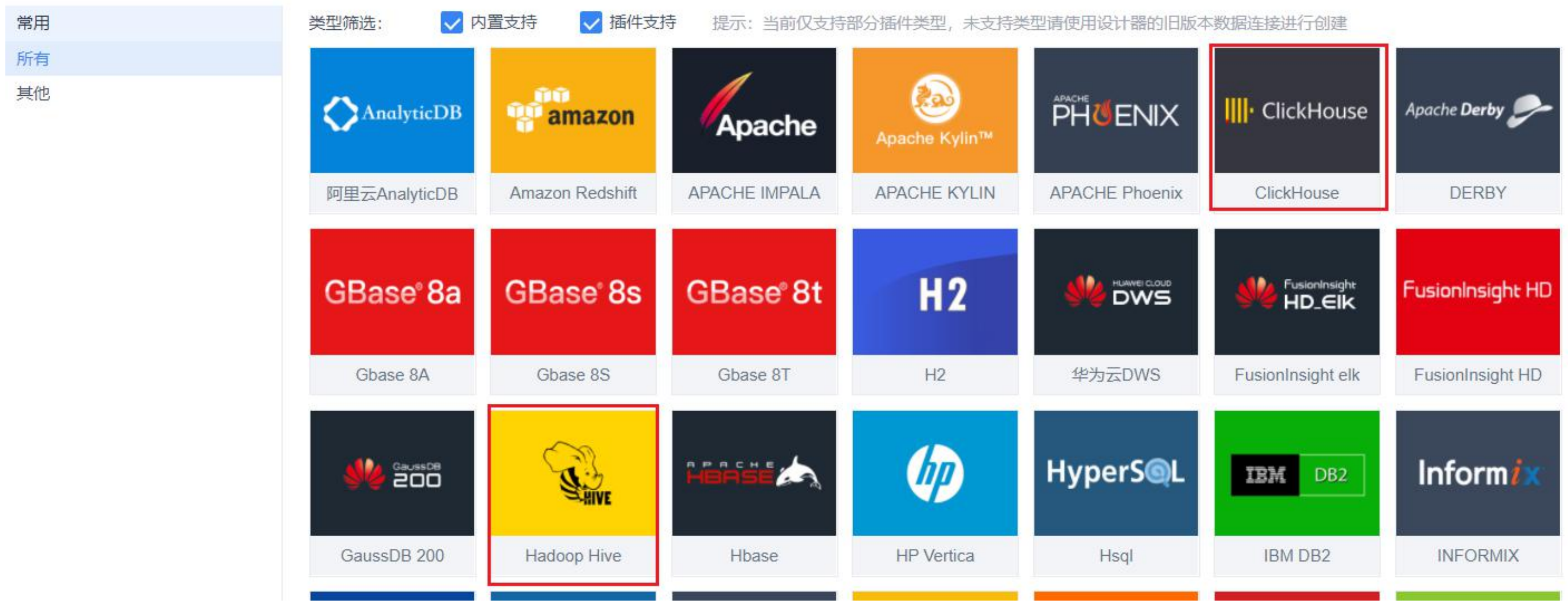
- 3- 启动FineBI即可：在数据准备窗口中查看



FineBI集成数据源准备工作

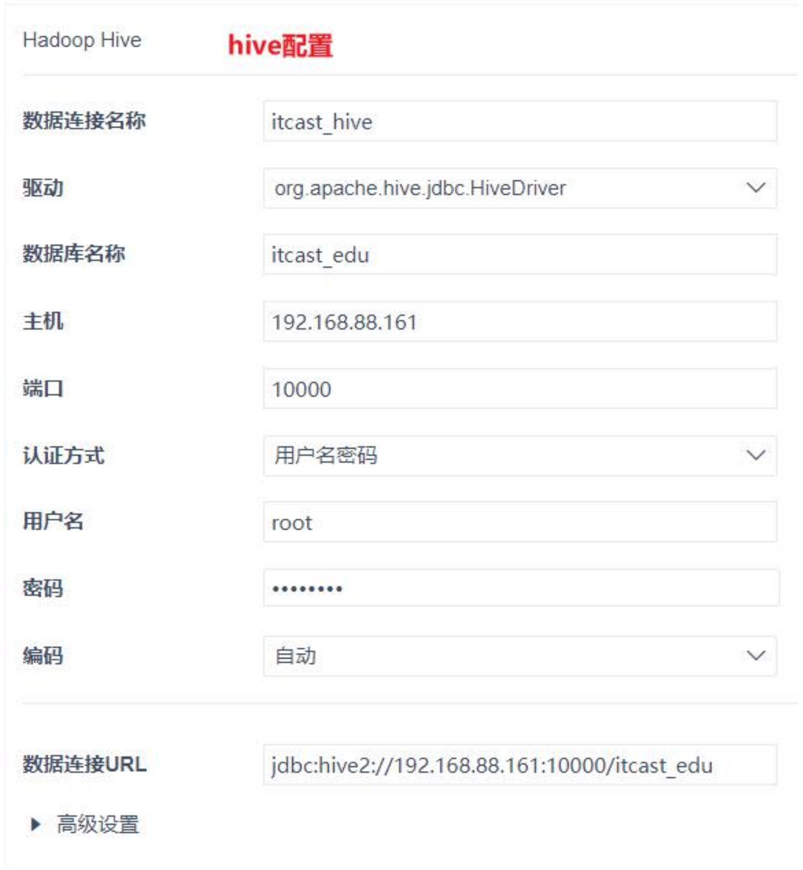
● 1- 基于FineBi连接ck和hive





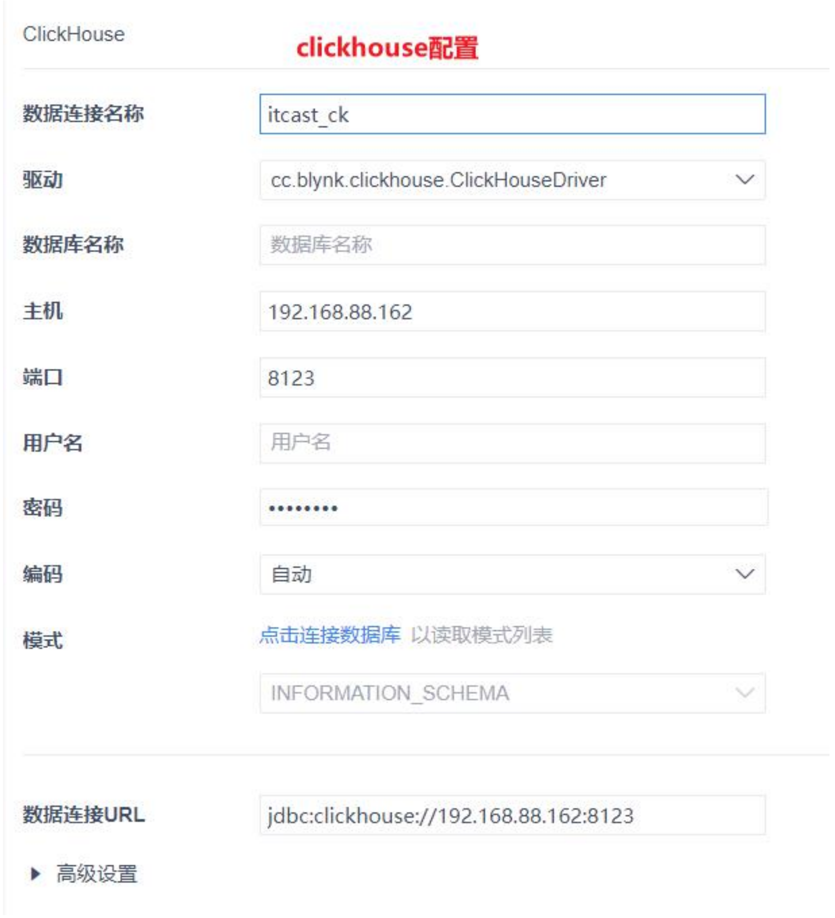
FineBI集成数据源准备工作

- 1- 基于FineBi连接ck和hive


Hadoop Hive hive配置

数据连接名称	itcast_hive
驱动	org.apache.hive.jdbc.HiveDriver
数据库名称	itcast_edu
主机	192.168.88.161
端口	10000
认证方式	用户名密码
用户名	root
密码	••••••••
编码	自动
数据连接URL	jdbc:hive2://192.168.88.161:10000/itcast_edu

▸ 高级设置

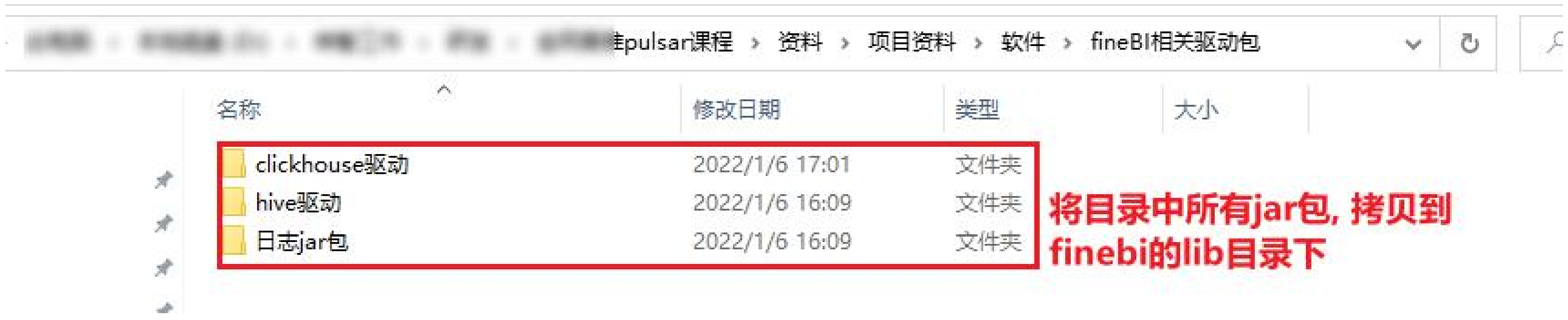

ClickHouse clickhouse配置

数据连接名称	itcast_ck
驱动	cc.blynk.clickhouse.ClickHouseDriver
数据库名称	数据库名称
主机	192.168.88.162
端口	8123
用户名	用户名
密码	••••••••
编码	自动
模式	点击连接数据库 以读取模式列表
	INFORMATION_SCHEMA
数据连接URL	jdbc:clickhouse://192.168.88.162:8123

▸ 高级设置

FineBI集成数据源准备工作

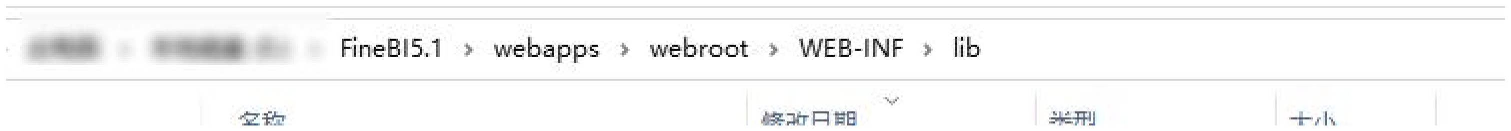
- 2- 驱动说明： 默认FineBi并没有hive驱动和ck的驱动， 需要下载驱动， 并放置到 finebi的lib目录下



[redacted] pulsar课程 › 资料 › 项目资料 › 软件 › fineBI相关驱动包

名称	修改日期	类型	大小
clickhouse驱动	2022/1/6 17:01	文件夹	
hive驱动	2022/1/6 16:09	文件夹	
日志jar包	2022/1/6 16:09	文件夹	

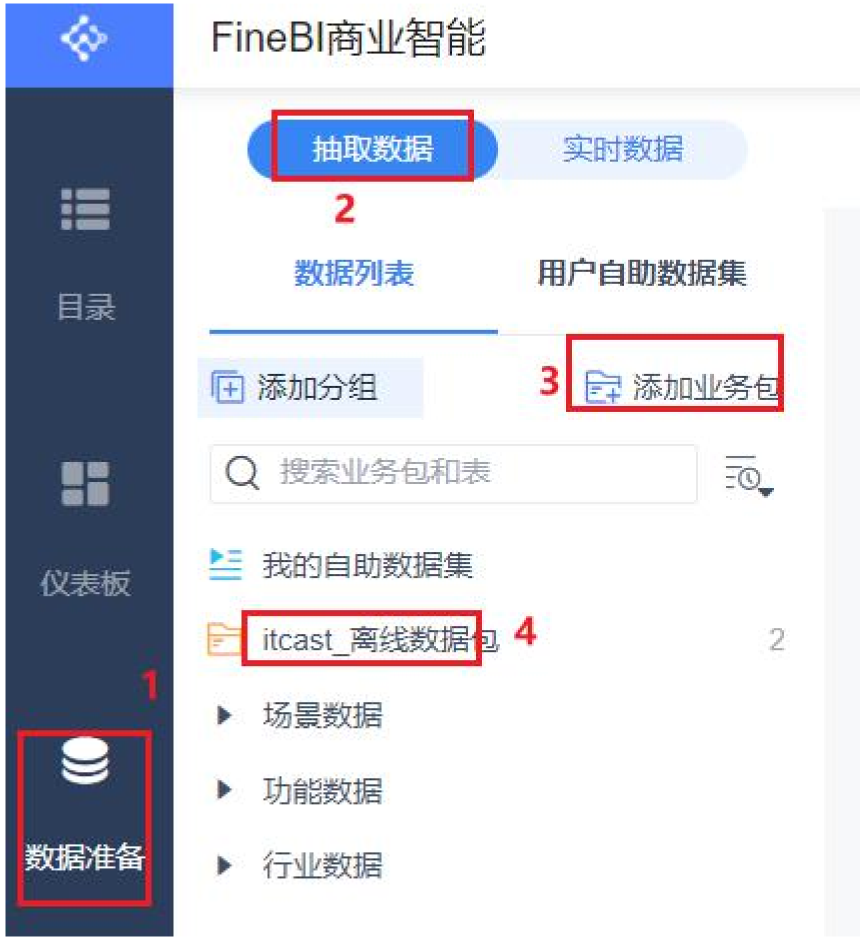
将目录中所有jar包，拷贝到 finebi的lib目录下

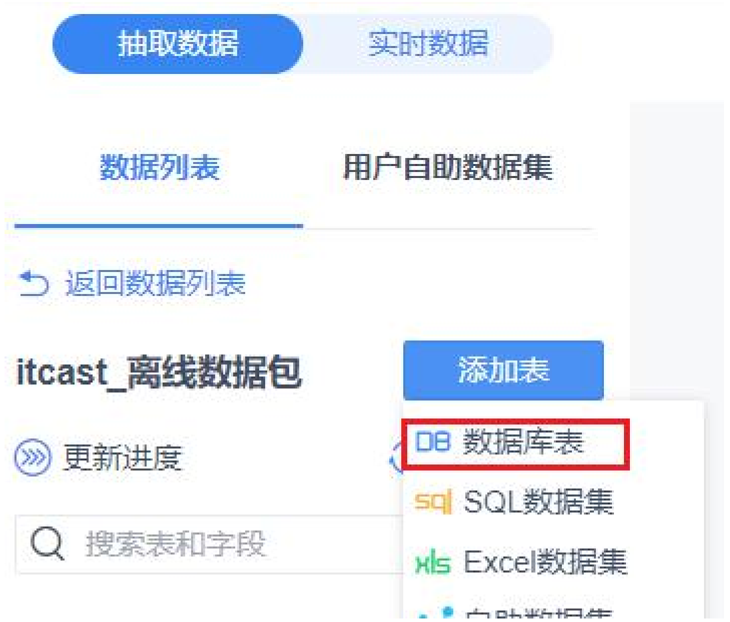


[redacted] › FineBI5.1 › webapps › webroot › WEB-INF › lib

FineBI集成数据源准备工作

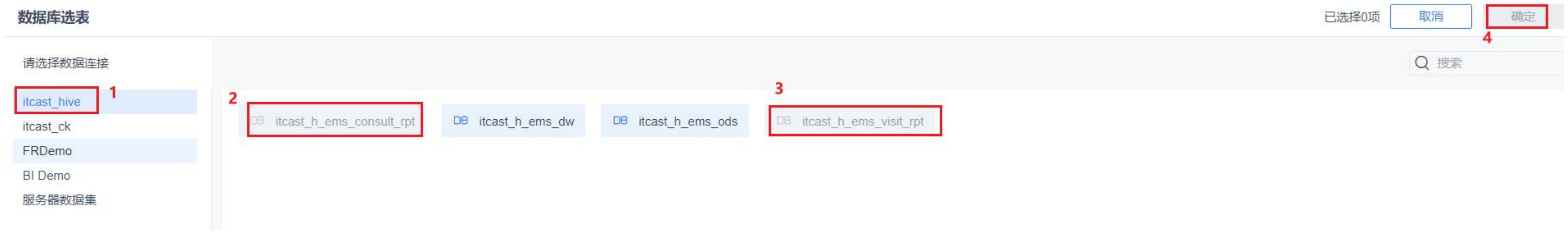
- 3- 数据准备：离线数据集准备





FineBI集成数据源准备工作

● 3- 数据准备：离线数据集准备



数据库选表

已选择0项 取消 确定 4

请选择数据连接

itcast_hive 1

itcast_ck

FRDemo

BI Demo

服务器数据集

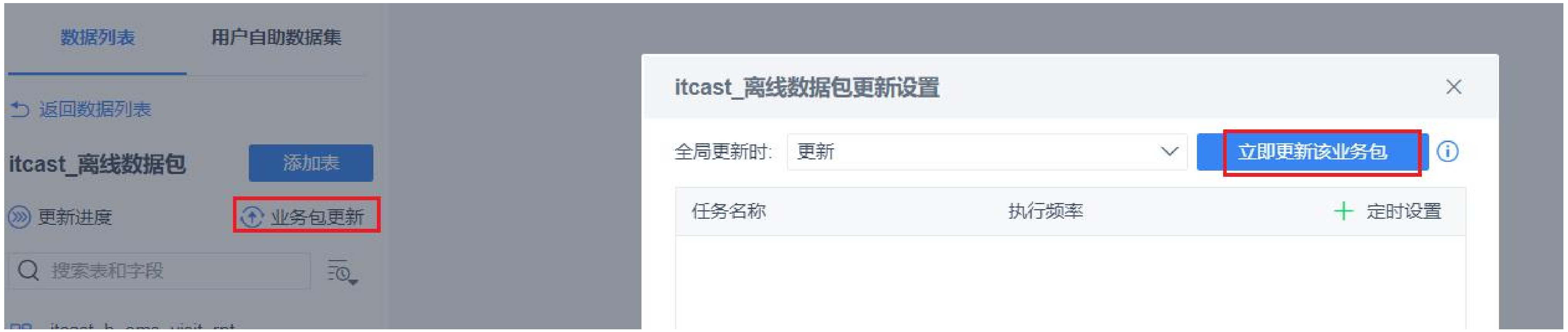
搜索

2 itcast_h_ems_consult_rpt

itcast_h_ems_dw

itcast_h_ems_ods

3 itcast_h_ems_visit_rpt



数据列表 用户自助数据集

返回数据列表

itcast_离线数据包 添加表

更新进度 业务包更新

搜索表和字段

itcast_离线数据包更新设置

全局更新时：更新

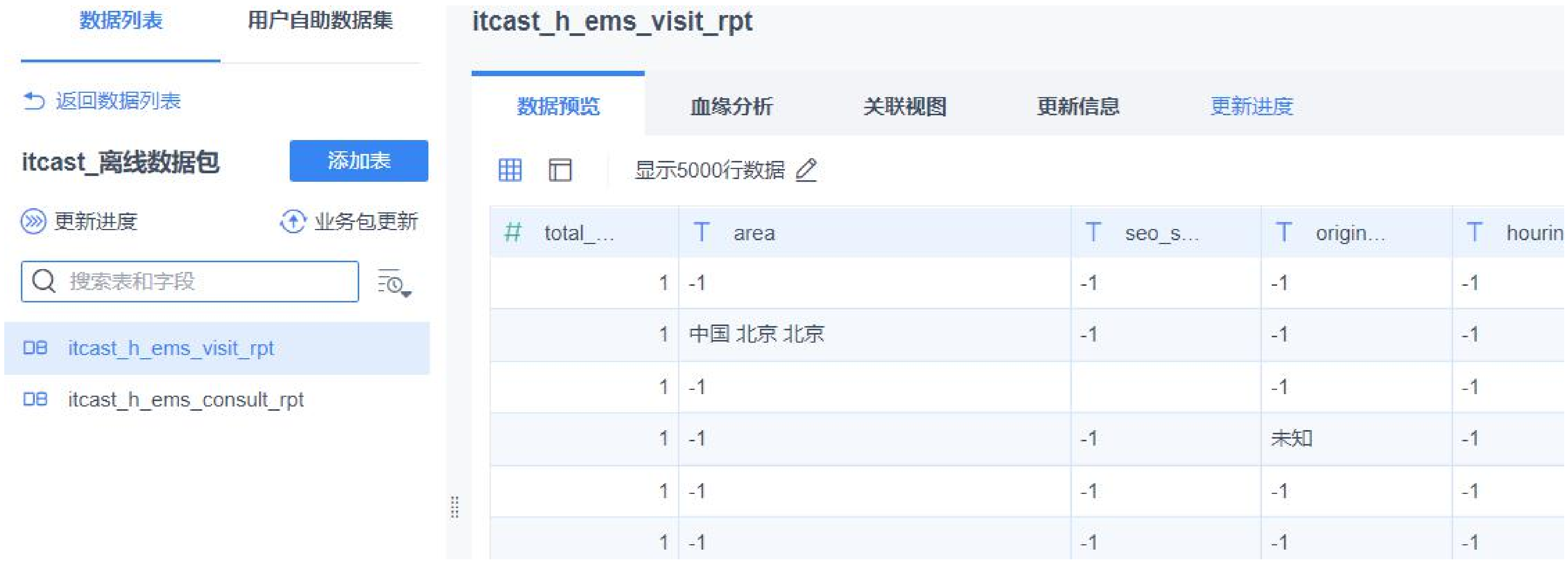
立即更新该业务包

任务名称	执行频率	定时设置

FineBI集成数据源准备工作

● 3- 数据准备：离线数据集准备

在连接hive的时候，如果遇到字段是乱码的，可以直接手动重命名调整即可

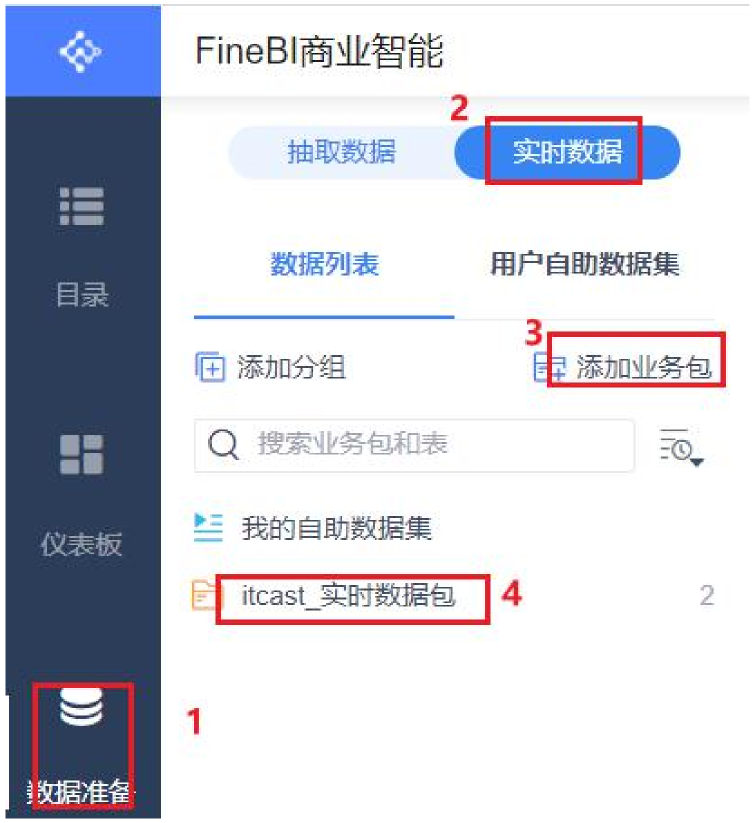


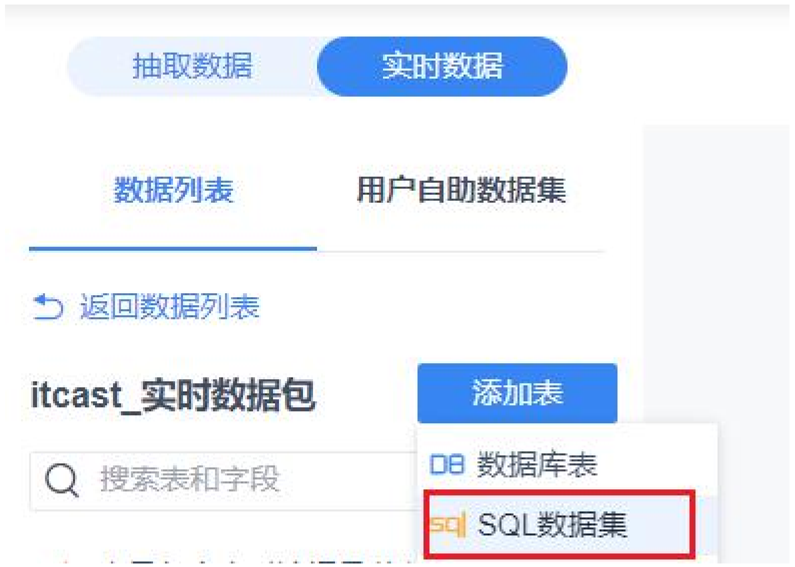
itcast_h_ems_visit_rpt

# total_...	T area	T seo_s...	T origin...	T hourin
1	-1	-1	-1	-1
1	中国 北京 北京	-1	-1	-1
1	-1		-1	-1
1	-1	-1	未知	-1
1	-1	-1	-1	-1
1	-1	-1	-1	-1

FineBI集成数据源准备工作

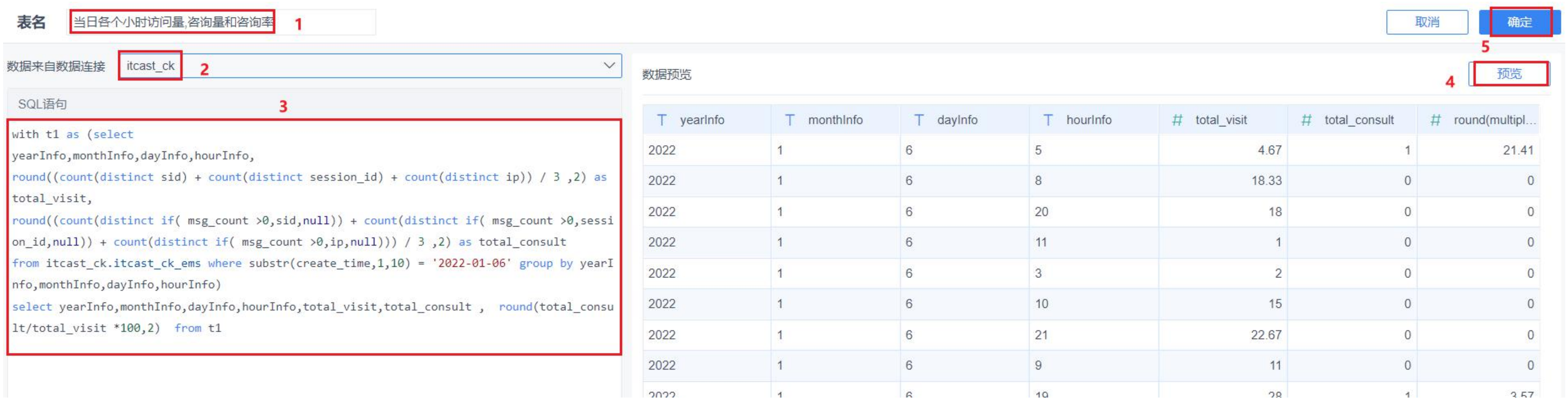
- 4- 数据准备：实时数据集准备





FineBI集成数据源准备工作

- 4- 数据准备：实时数据集准备

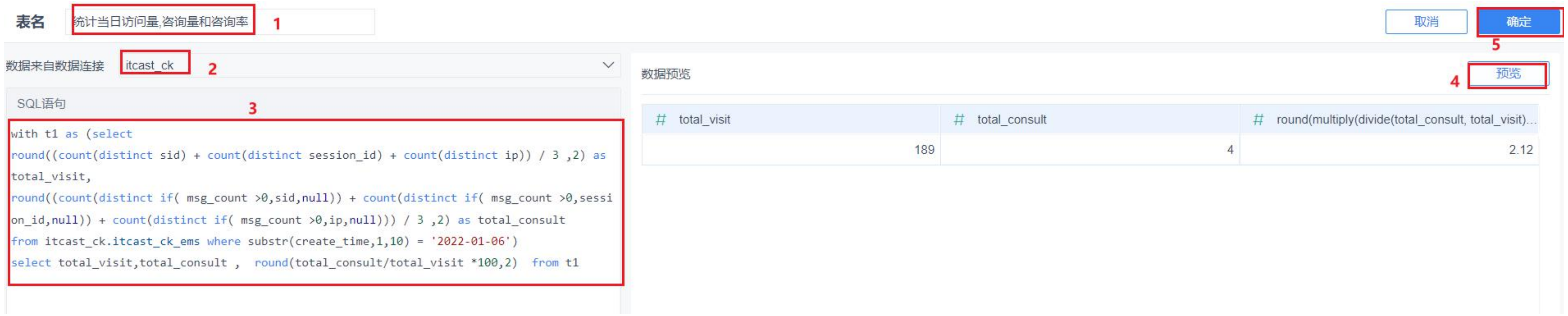


```
with t1 as (select
yearInfo,monthInfo,dayInfo,hourInfo,
round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) / 3 ,2) as
total_visit,
round((count(distinct if( msg_count >0,sid,null)) + count(distinct if( msg_count >0,sessi
on_id,null)) + count(distinct if( msg_count >0,ip,null))) / 3 ,2) as total_consult
from itcast_ck.itcast_ck_ems where substr(create_time,1,10) = '2022-01-06' group by yearI
nfo,monthInfo,dayInfo,hourInfo)
select yearInfo,monthInfo,dayInfo,hourInfo,total_visit,total_consult ,  round(total_consu
lt/total_visit *100,2)  from t1
```

T yearInfo	T monthInfo	T dayInfo	T hourInfo	# total_visit	# total_consult	# round(multipl...
2022	1	6	5	4.67	1	21.41
2022	1	6	8	18.33	0	0
2022	1	6	20	18	0	0
2022	1	6	11	1	0	0
2022	1	6	3	2	0	0
2022	1	6	10	15	0	0
2022	1	6	21	22.67	0	0
2022	1	6	9	11	0	0
2022	1	6	19	28	1	3.57

FineBI集成数据源准备工作

● 4- 数据准备：实时数据集准备

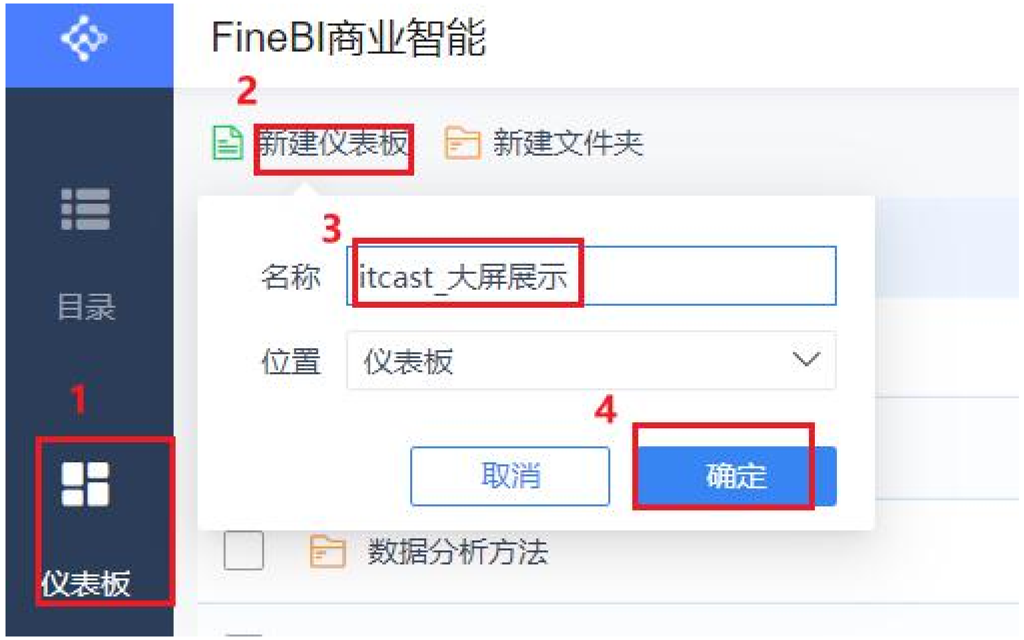


```
with t1 as (select
round((count(distinct sid) + count(distinct session_id) + count(distinct ip)) / 3 ,2) as
total_visit,
round((count(distinct if( msg_count >0,sid,null)) + count(distinct if( msg_count >0,sessi
on_id,null)) + count(distinct if( msg_count >0,ip,null))) / 3 ,2) as total_consult
from itcast_ck.itcast_ck_ems where substr(create_time,1,10) = '2022-01-06')
select total_visit,total_consult ,  round(total_consult/total_visit *100,2)  from t1
```

# total_visit	# total_consult	# round(multiply(divide(total_consult, total_visit)...
189	4	2.12

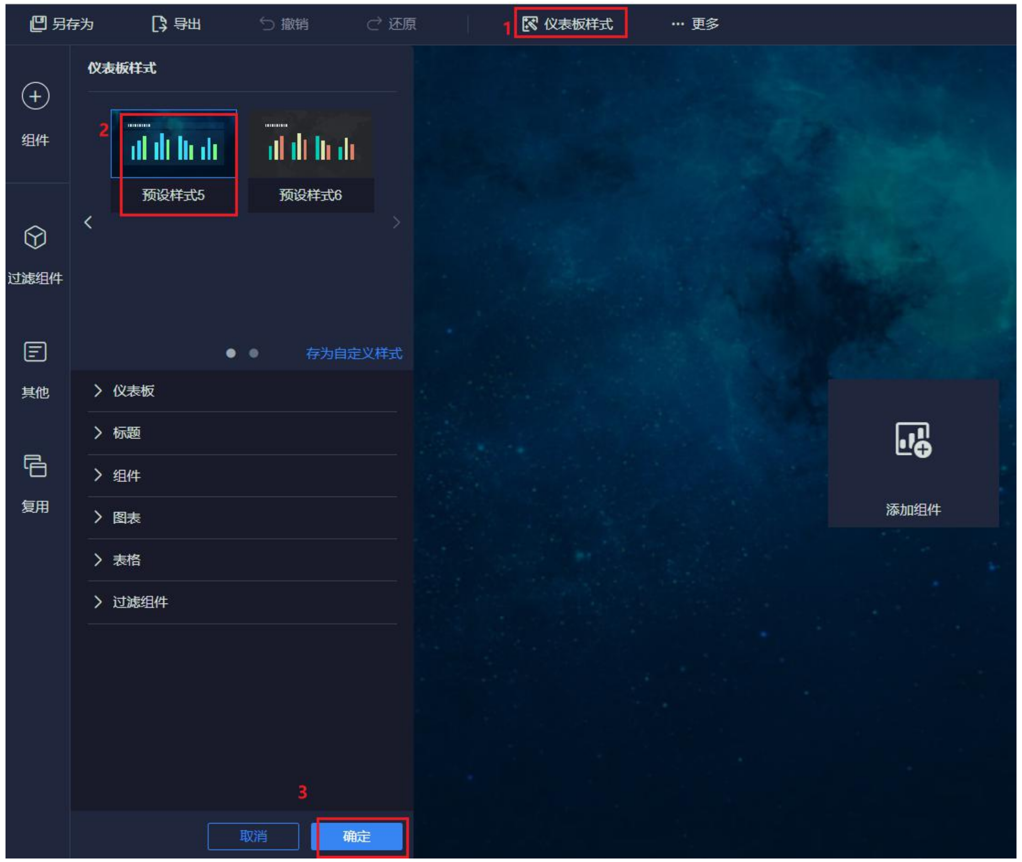
FineBI实现实时大屏

- 1- 创建仪表盘



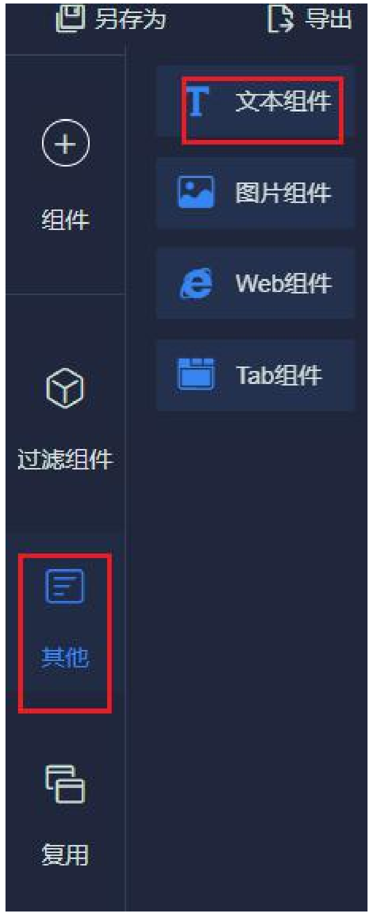
FineBI实现实时大屏

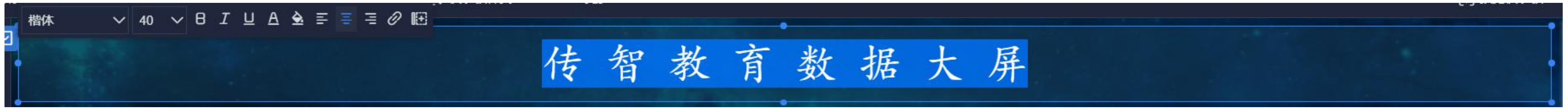
- 2- 修改仪表盘样式



FineBI实现实时大屏

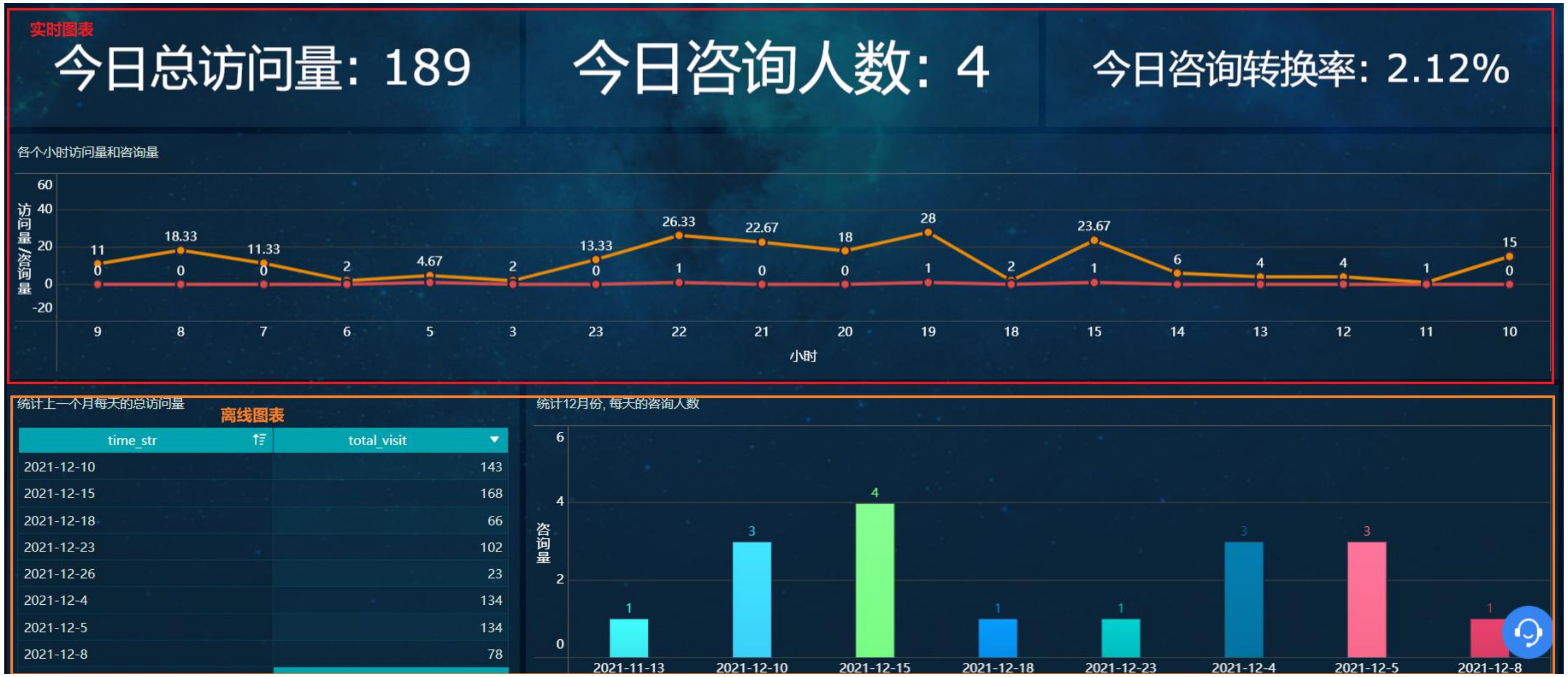
- 3- 添加标题





FineBI实现实时大屏

- 4- 进行后续的图表制作： 此部分细节较多，大家可根据视频或者官网说明来操作，难度系数不高



今日总访问量：189

今日咨询人数：4

今日咨询转换率：2.12%

统计上一个月每天的总访问量

time_str	total_visit
2021-12-10	143
2021-12-15	168
2021-12-18	66
2021-12-23	102
2021-12-26	23
2021-12-4	134
2021-12-5	134
2021-12-8	78