hosted by Alibaba Group 阿里巴巴集团 APACHE HBASE

HBase at China Telecom

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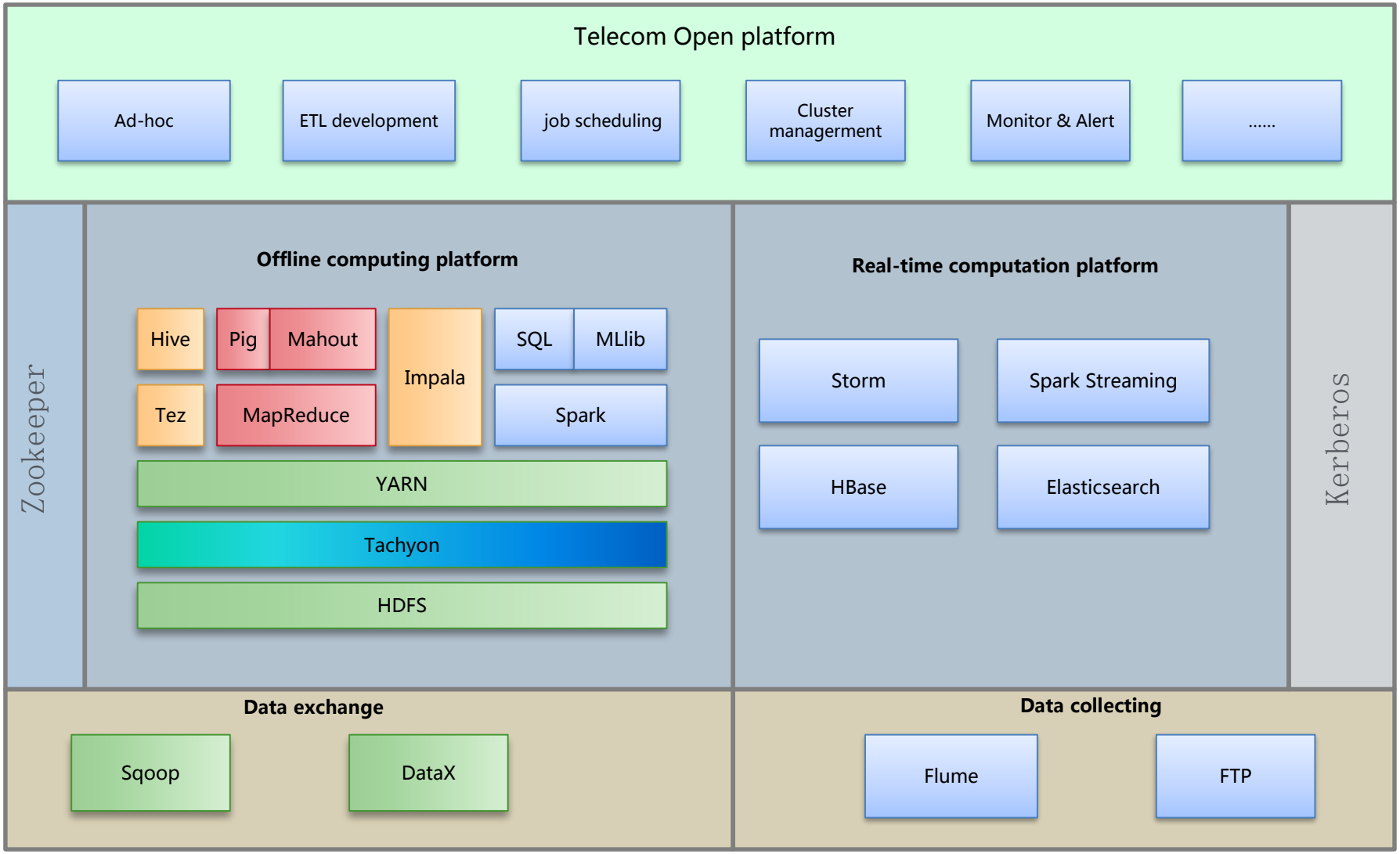
01 Infrastructure & Application

HBase usage at China Telecom

Infrastructure



China Telecom HBase Platform

- 322 hosts in a independent HDFS cluster ,32 cores，256GB memory，3.6T*12 disk

- 6 HBase clusters with different kinds of application
  - Persistence for Streaming Jobs
  - Online writing/reading
  - Kylin support

- 520 TB data，1 TB/day

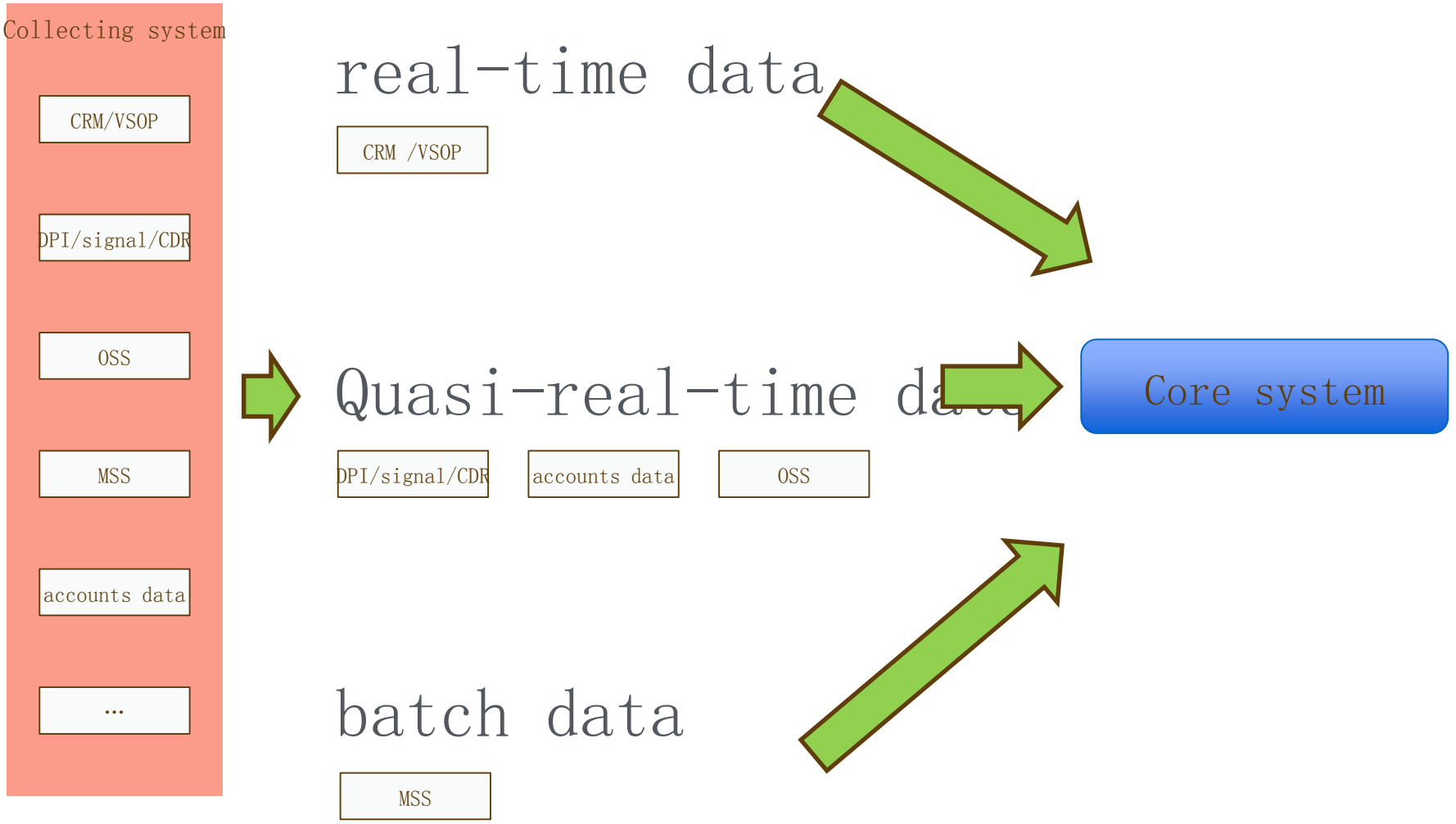
- HBase1.2.0--CDH 5.12.1

Persistence for Streaming Jobs

- core system
- data collecting system

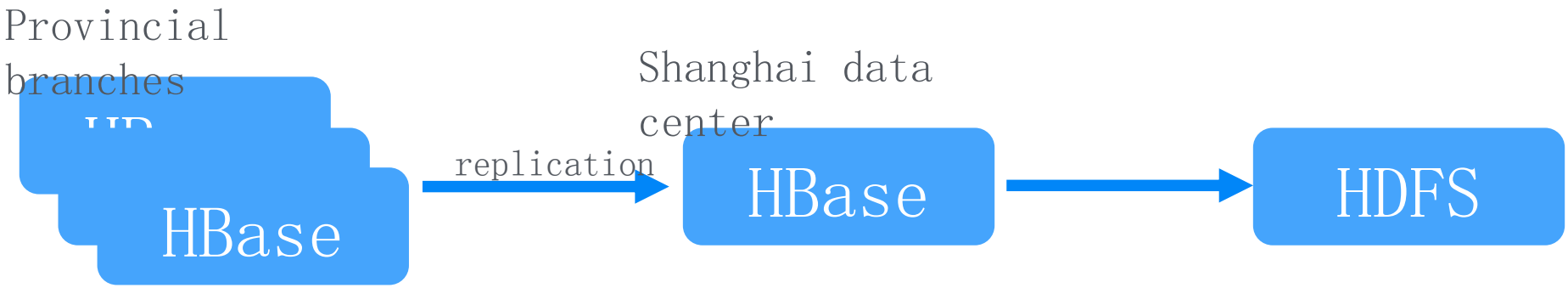
Data collecting system

Collect different kinds of data with different kinds of collecting method



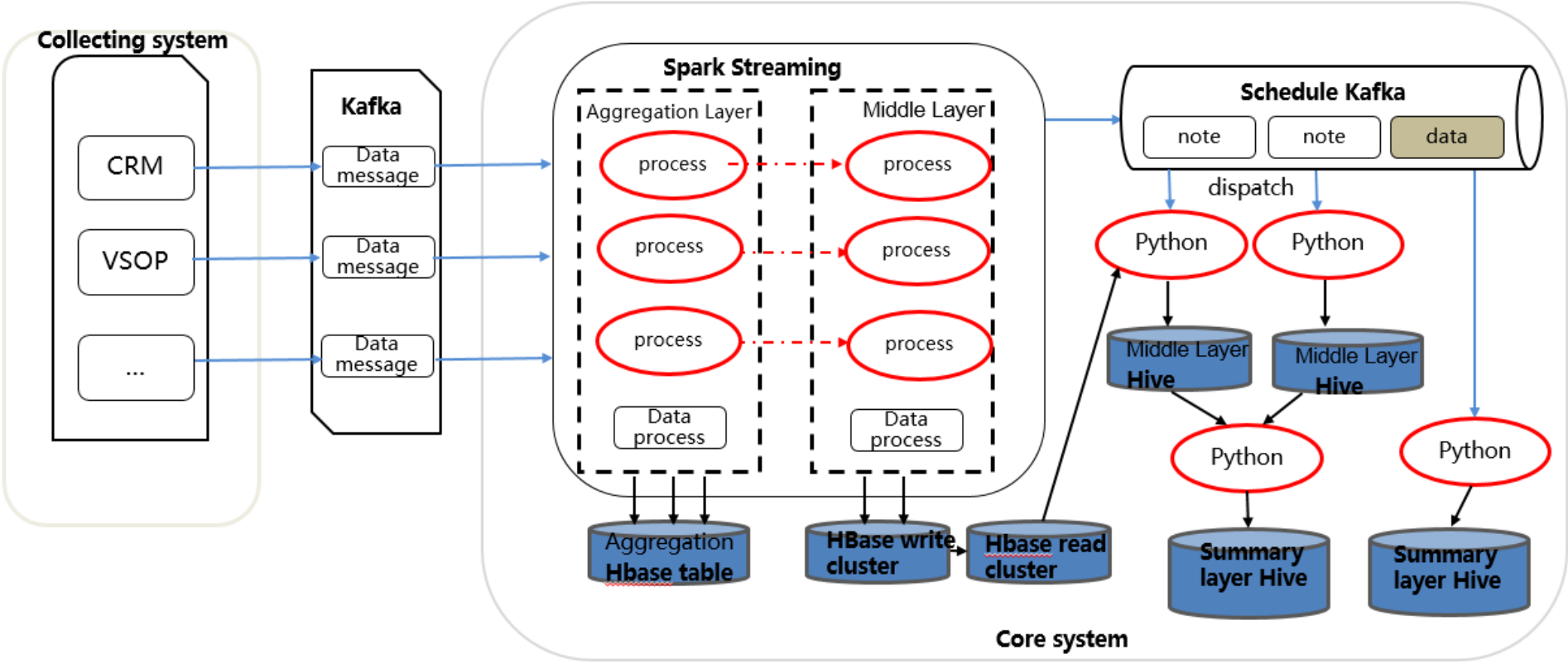
Data collecting system

OSS data collecting use HBase replication to receive data from 31 Provincial branches



Core System

- core system use HBase to store middle layer data and Aggregation layer data through Spark Streaming



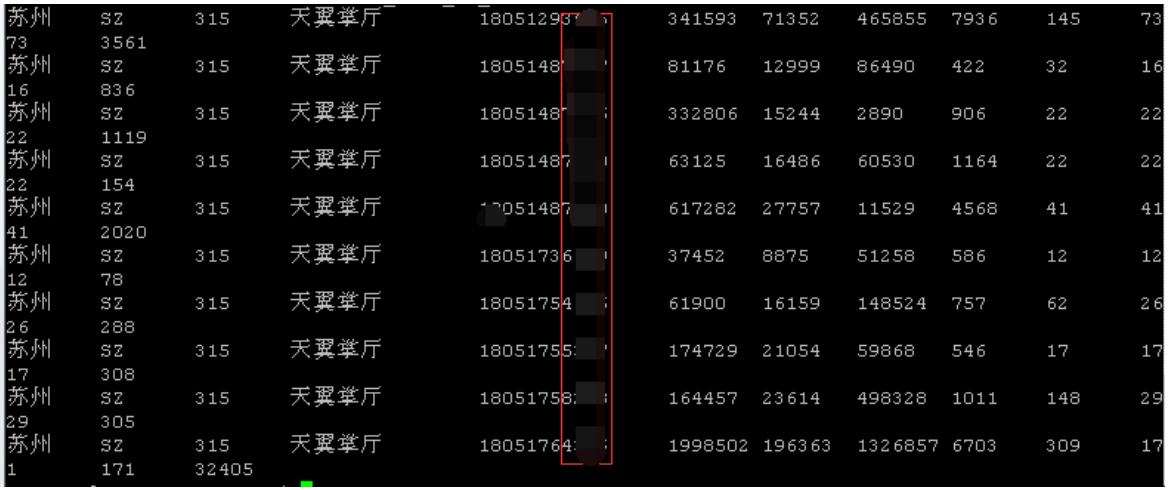
Online writing/reading application

- DPI data service
- Location-based data service

• DPI data service

- What is DPI data?

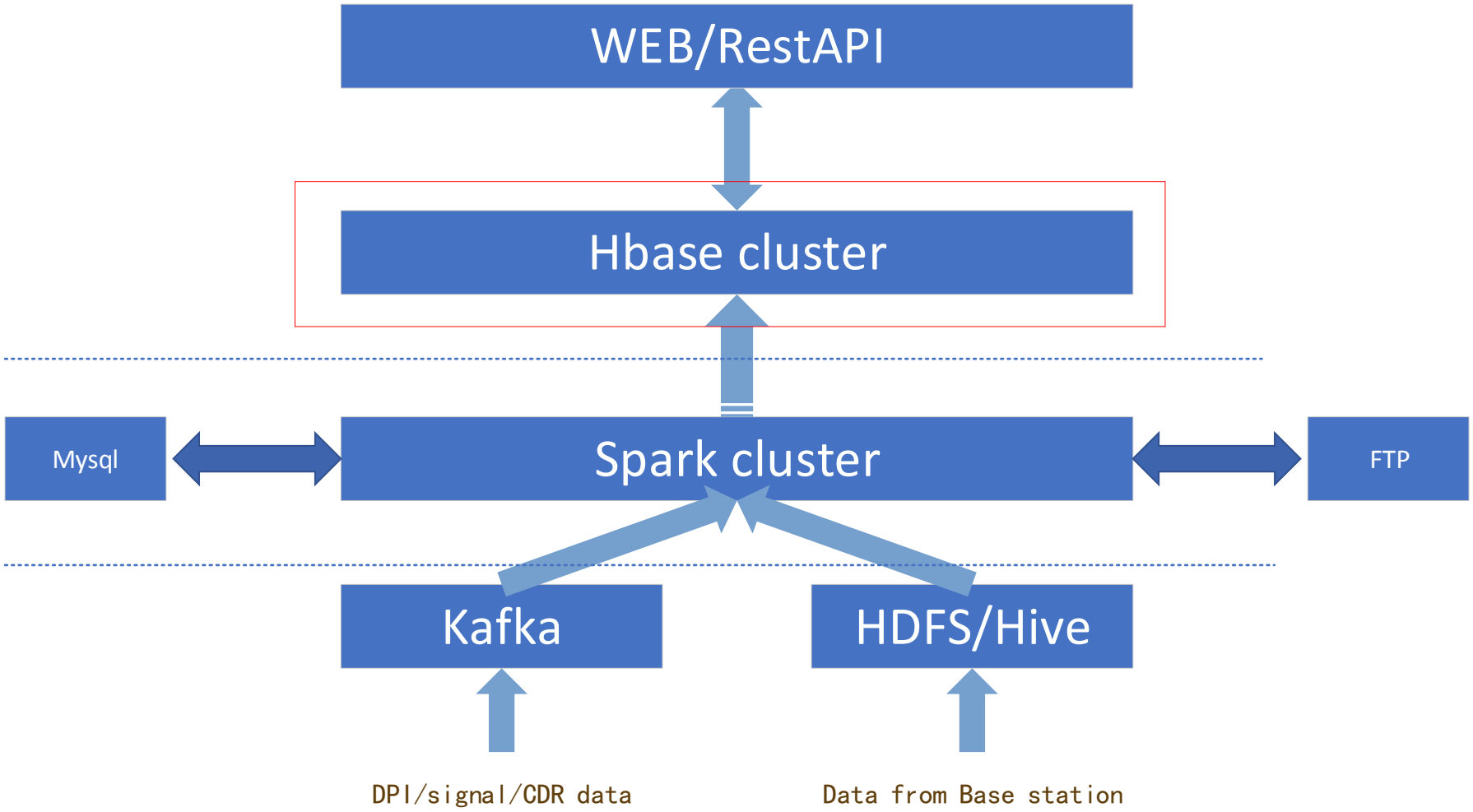
NAME	TYPE
city_name	string
city_id	string
appid	string
appname	string
mdn	string
inputoctets	bigint
outputoctets	bigint
duration	bigint
anrespdelay	bigint
girespdelay	bigint
num	bigint
httpnum	bigint
respdelay	bigint



• DPI data service

- How to use DPI data ?

• Location-based data service



• Location-based data service

wzfwcontroller : 位置服务相关api

Show/Hide | List Operations | Expand Operations

GET	/add	test
GET	/current-city	个人用户当前城市查询功能
GET	/current-location	个人用户当前位置查询功能
GET	/history-location	个人用户历史位置查询功能
GET	/history-track	个人用户历史轨迹查询功能
GET	/residence-location	居住地分析
GET	/roaming-destination	漫游地查询功能
GET	/time-interval	时间段活动地分析
GET	/weekend-location	周末活动地分析
GET	/work-location	工作地分析

02 Monitor & Optimization

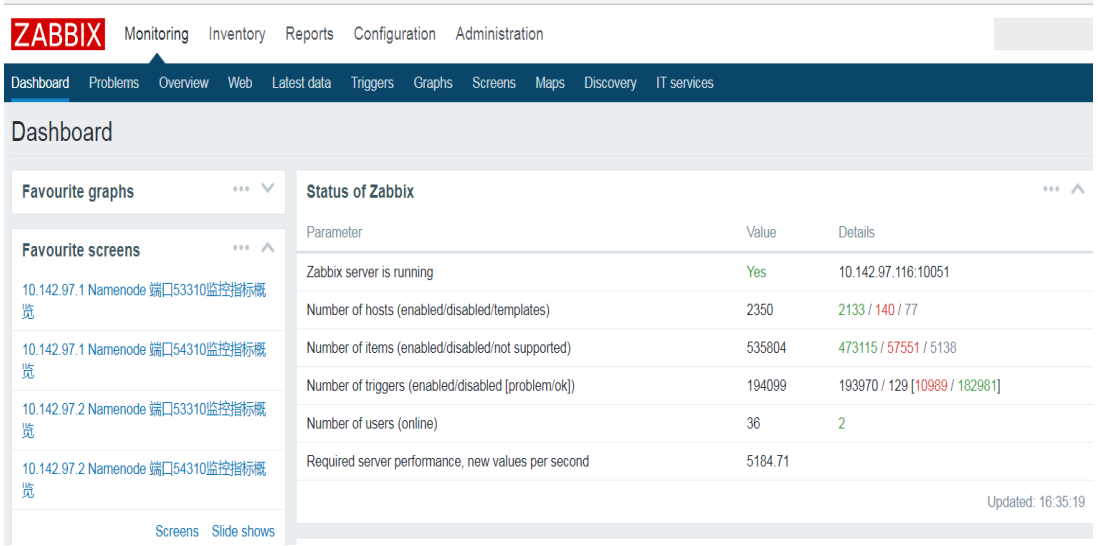
How do we monitor HBase and optimization

HBase Monitor

- Tools

  ganglia-3.6.0
  Zabbix-3.2.4

- Ganglia for HBase basic metrics
- Zabbix for important items to alert

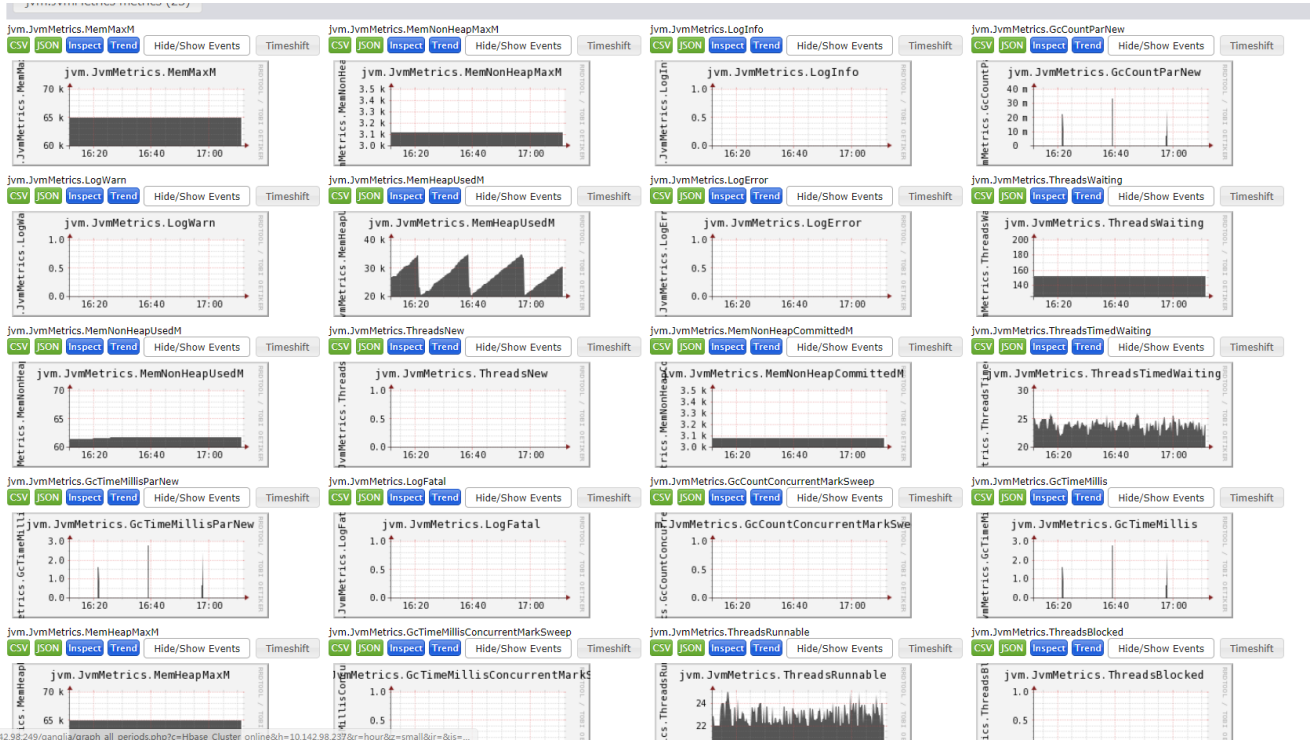


• HBase ganglia configuration

Edit HBase config file hadoop-metrics2-hbase.properties

```
*.source.filter.class=org.apache.hadoop.metrics2.filter.RegexFilter
*.record.filter.class=${*.source.filter.class}
*.metric.filter.class=${*.source.filter.class}
hbase.sink.ganglia.metric.filter.exclude=^(.*table.*)|(\\w+metric)|(\\w+region\\w+)|(.*Replication.*)|(Balancer\\w+)|(\\w+A
ssign\\w+)|(\\w+percentile)|(\\w+max)|(\\w+median)|(\\w+min)|(MetaHlog\\w+)|(\\w+WAL\\w+)|(.*bigdata.chinatelecom.cn.*)$
hbase.sink.ganglia.class=org.apache.hadoop.metrics2.sink.ganglia.GangliaSink31
hbase.sink.ganglia.tagsForPrefix.jvm=ProcessName
*.sink.ganglia.period=20
```

Than we can see many metrics items



• Important metrics

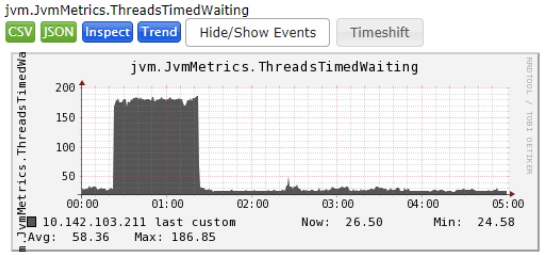
Type	Items
System status	ping Available memory in percent Disk usage
HDFS status	NameNode port DataNode port JournalNode port HDFS avaliable space
HBase status	HBase Master Port HBase Region Server Port
Zookeeper status	ZooKeeper Port ZKFC Port
HBase RPC	regionserver.TotalCallTime regionserver.ProcessCallTime regionserver.QueueCallTime regionserver.numActiveHandler regionserver.ipc.numCallsInGeneralQueue regionserver.ipc.numOpenConnections regionserver.RegionServer.numCallsInWriteQueue regionserver.RegionServer.numCallsInReadQueue
Hbase IO	regionserver.Server.Mutate_99th_percentile regionserver.wal.SyncTime_99th_percentile regionserver.server.Get_99th_percentile regionserver.server.ScanTime_99th_percentile

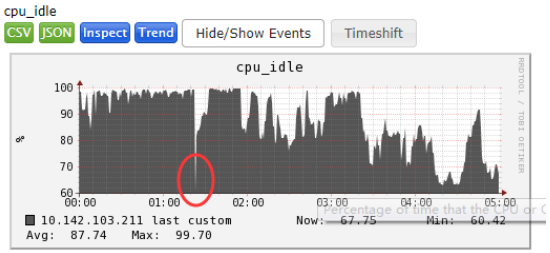
• Important metrics

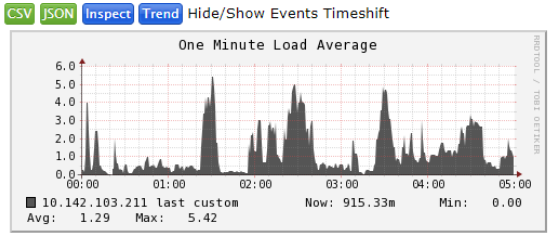
Type	Items
HBase region	Region num,size BlockCache hit radio
JVM GC	jvm.JvmMetrics.GcTimeMillis jvm.JvmMetrics.GcCount GC log

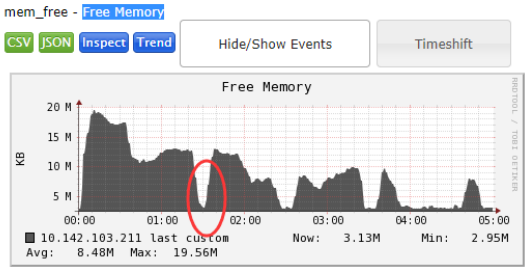
HBase Debug case

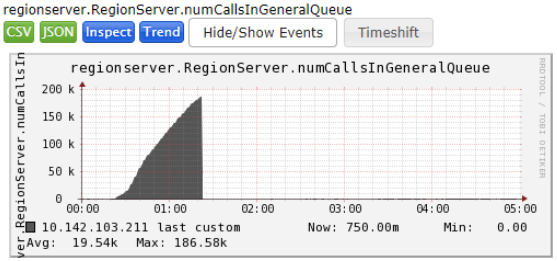
- One day, our core data system hanged when trying to connection Hbase cluster…

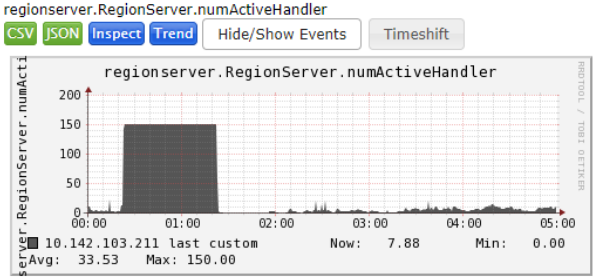


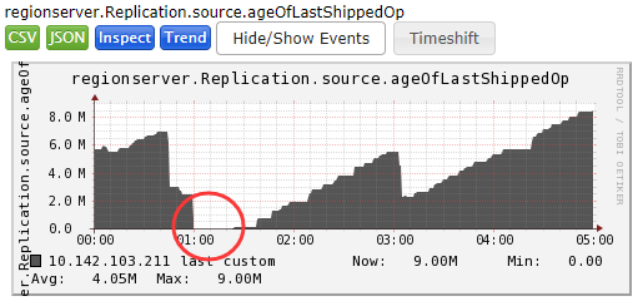


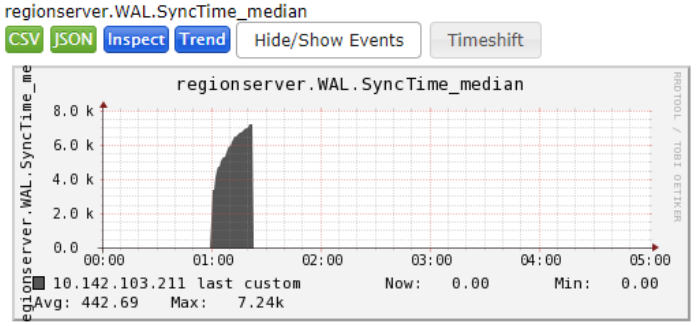












HBase Optimization

- CMS vs G1
- Read/Write Splitting and some Optimization

CMS vs G1


```
"-Xms64g -Xmx64g -Xmn16g -XX:+UseParNewGC -XX:+UseConcMarkSweepGC \
   -XX:CMSInitiatingOccupancyFraction=65 -XX:+CMSParallelRemarkEnabled \
   -XX:SurvivorRatio=28 -XX:PermSize=3g -XX:MaxPermSize=3g \
```

CMS to G1

```
-server -Xms96g -Xmx96g -XX:PermSize=512m -XX:MaxPermSize=512m \
-XX:+UseG1GC -XX:InitiatingHeapOccupancyPercent=30 -XX:G1MixedGCCountTarget=3 \
-XX:G1ReservePercent=15 -XX:G1HeapWastePercent=5 \
```

Why?

Read/Write Splitting Optimization

- Use replication
- Use Kerberos
- Optimization hbase.ipc

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Q&A

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Thanks