认识 OpenTSDB

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http://liubin.org/opentsdb-intro

什么是TSDB

TSDB = Time series database

存储时序列（time-series）数据

以时间建立索引

数据特点

数据量大

结构简单

metric + timestamp + value [+ meta]

TSDB特点

时效性

顺序写

写多于读

无更新

区块（bulk）删除

TSDB特点

顺序读

读优化

存储引擎

HDFS

HBase

Cassandra

LevelDB

RRDTools

Schemaless VS Schema

灵活

性能

Query Language

```
select mean(value) from
system.load.1
where role='user'
 and time >= xxx
 and time <= yyy
group by dc
```

TSDB

InfluxDB

RRDtool（Round Robin Database Tool）

Graphite

Druid/Pinot

Prometheus

Riak TS

OpenTSDB

HBase

Tags

HTTP API

聚合计算

OpenTSDB用例（2014）

OVH
35 nodes

100k writes/s

Yahoo
15 nodes

280k writes/s

Arista
单节点，无HDFS

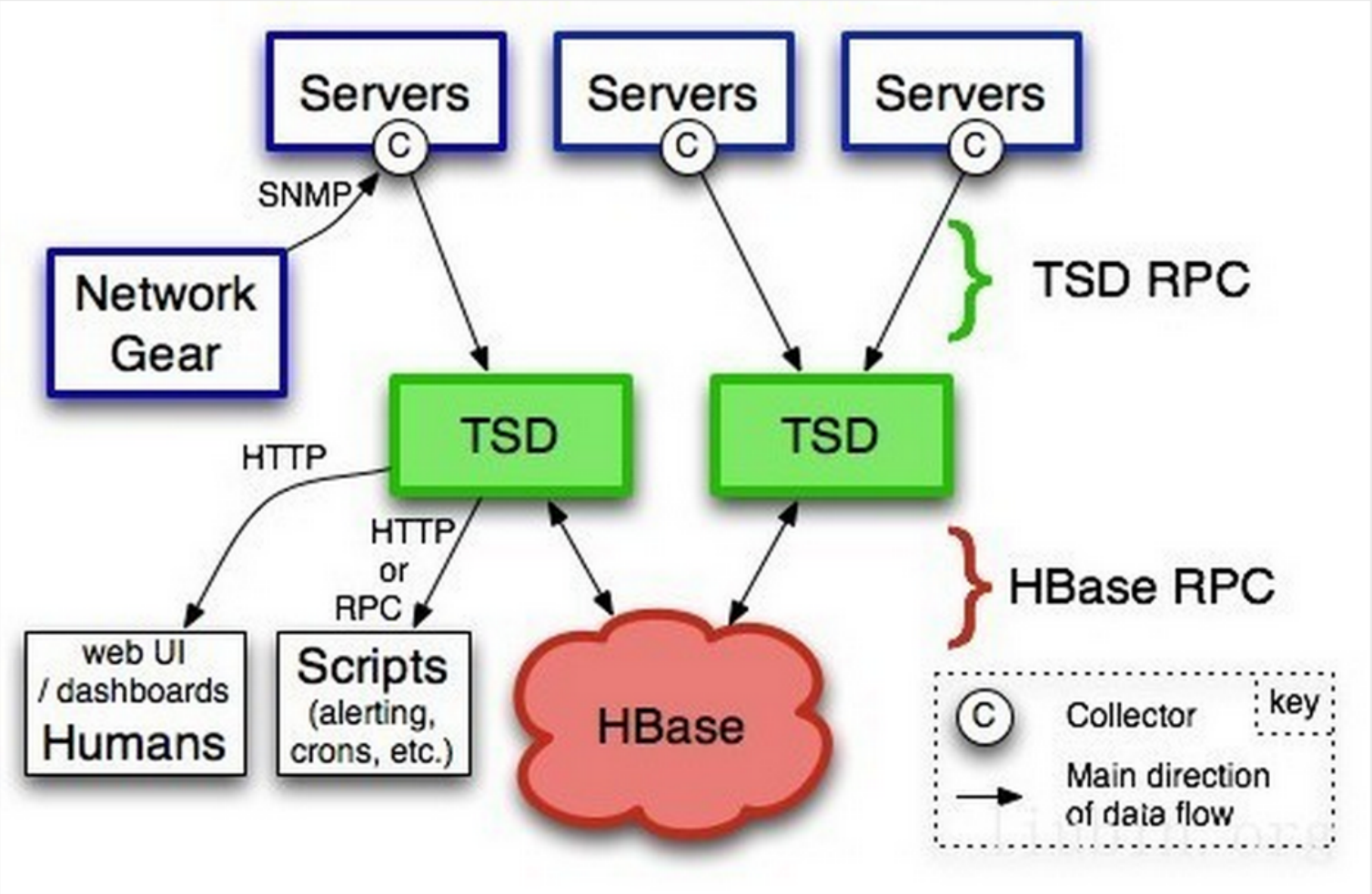
5k writes/s

500G

Box
23 nodes

90k writes/s

OpenTSDB


Servers
Servers
Servers
C
C
C
SNMP
Network Gear
TSD RPC
TSD
TSD
HTTP
HTTP or RPC
HBase RPC
web UI / dashboards
Humans
Scripts (alerting, crons, etc.)
HBase
C
Collector
key
Main direction of data flow

Write Data（Telnet）

```
$ telnet localhost 4242
put sys.load.1 1436333416 23 host=web01 user=10001
```

Write Data（HTTP）

```
POST -H "Content-Type: application/json" http://localhost:4242/api/

metric": "system.load.1",
timestamp": 1467090431,
value": 0.12,
tags": {
  "host": "web01",
  "dc": "tianjin"
```

Read Data

```
 POST -H "Content-Type: application/json" http://localhost:4242/api
 1435716527,
": [

"metric": "system.load.1",
"aggregator": "avg",
"tags": {
    "host": "*",
    "dc": "beijing"
}
```

OpenTSDB存储

HBase

UID

3600s/Row

行压缩

UID

metric

tagk

tagv

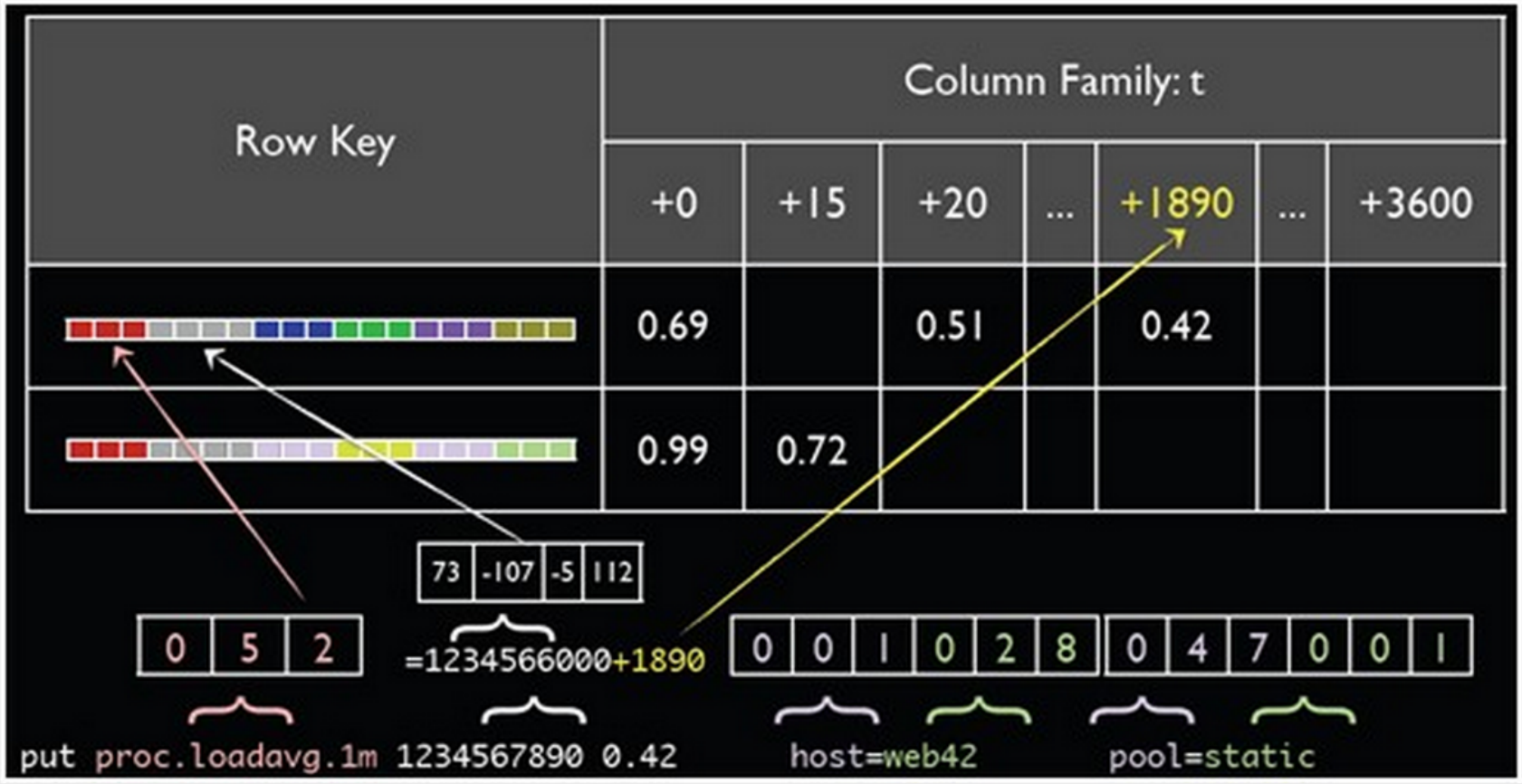
default: 3bytes

Row key

```
d><timestamp><tagk1><tagv1>[...<tagkN><tagvN>]

x01 + U\x9C\xAEP + \x00\x00\x01 + \x00\x00\x01 + \x00\x00\x02  + \x
er     1436333416          host    =      web01          user     =
```

Row key


Row Key
Column Family: t
+0
+15
+20
...
+1890
...
+3600
0.69
0.51
0.42
0.99
0.72
73
-107
-5
112
0
5
2
=1234566000+1890
0
0
1
0
2
8
0
4
7
0
0
1
put proc.loadavg.1m 1234567890 0.42
host=web42
pool=static

Demo

OpenTSDB in Docker

tcollector

```
cd ~/tcollector/
sudo ./tcollector start
```

Running OpenTSDB

```
docker run -d -p 4242:4242 liubin/opentsdb
```

Dashboard

https://github.com/Ticketmaster/metrilyx-2.0

想用?

HBase运维

Tag设计

Tag设计

docker.cpu.sys{containerid=58705}

docker.cpu.sys.58705

reference

http://www.slideshare.net/cloudera/4-opentsdb-hbasecon

http://www.slideshare.net/cloudera/operations-session-3

http://www.slideshare.net/HBaseCon/ecosystem-session-6

http://www.slideshare.net/oliverhankeln/opentsdb-metrics-for-a-distributed-world

Thanks

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