线上问题排查交流

@单农 - 挖财信用卡技术部

Agenda

- "汽车追尾"事故

- 快速响应线上问题

- 常见问题

汽车追尾

当事人

事故现场(道路)

交通警察

线上问题

代码　　　　问题现场(服务器)　　　　开发同学

快速响应线上问题

三步走：

1. 保存问题现场（快速分析）

2. 重启线上服务器

3. 线下定位问题代码

保存问题现场-1

工欲善其事，必先利其器

- jps - JVM Process Status Tool
- /data/program/<groupId>/<artifactId>/<version>/bin/service.sh dump
  - jstat - JVM Statistics Monitoring Tool
  - jinfo - Configuration Info for Java
  - jstack - Stack Trace for Java (Thread Dump)
  - jmap - Memory Map for Java (Heap Dump)
    - bin/service.sh heapdump

保存问题现场-2

- jps -lmv | grep $appname
- jstat -gccapacity -h7 $pid 1s、jstat -gcutil -h7 $pid 1s
- jinfo $pid
- jstack $pid
- jmap -dump:live,format=b,file="$filename" $pid
- jmap -histo $pid、jmap -heap $pid

保存问题现场-3

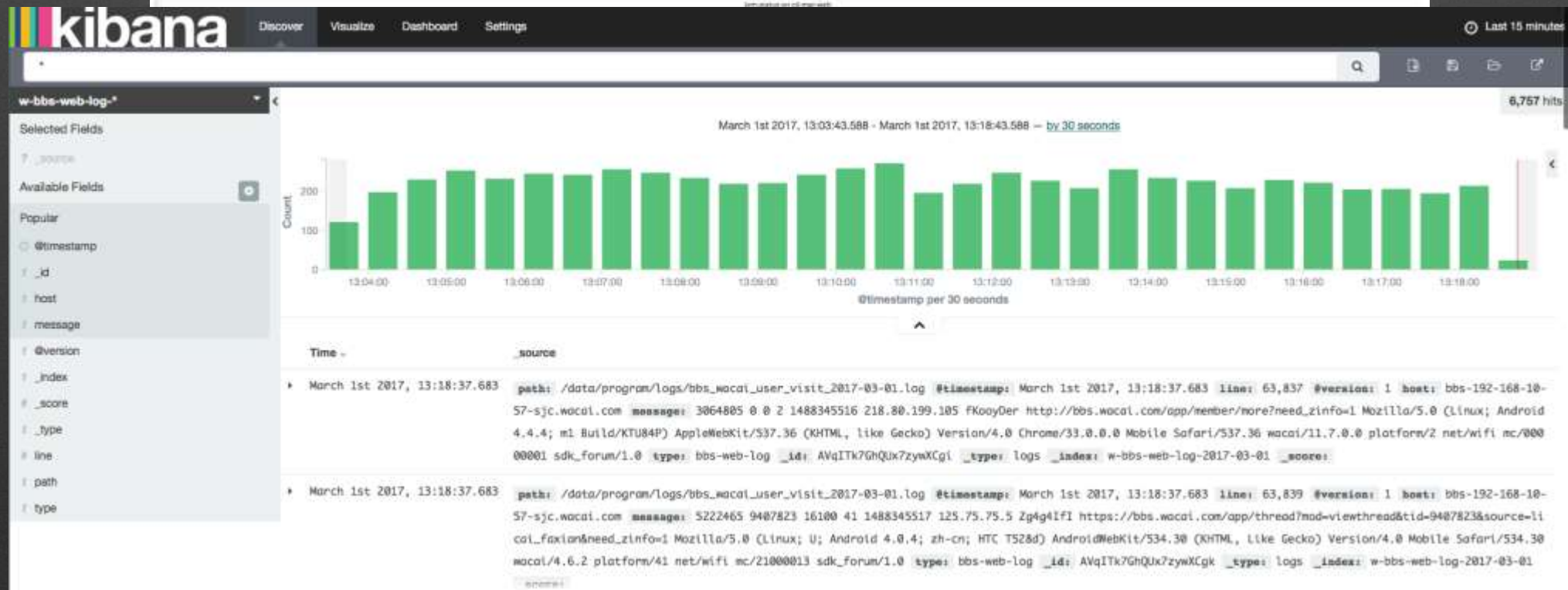- **top** - display Linux tasks

- **lsof** - list open files

- **netstat** - Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships

- **iostat** - Report Central Processing Unit (CPU) statistics and input/output statistics for devices and partitions

- **mpstat** - Report processors related statistics

- **vmstat** - Report virtual memory statistics

- **free** - Display amount of free and used memory in the system

- **sar** - Collect, report, or save system activity information

- **uptime** - Tell how long the system has been running

保存问题现场-4

- top -d 3 -u $username、top -H
- lsof -p $pid
- netstat -an
- iostat
- mpstat -P ALL 3
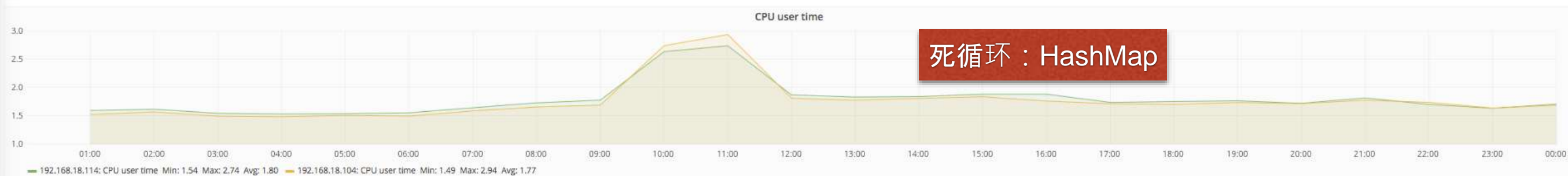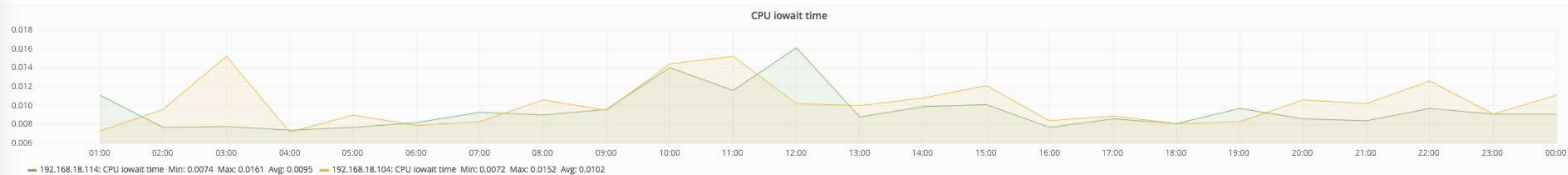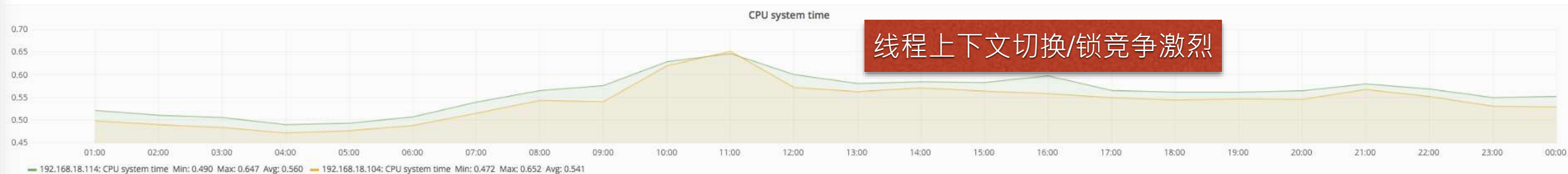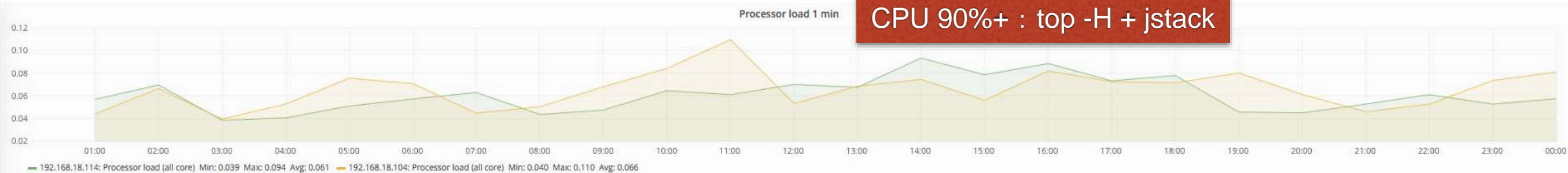- vmstat -S M
- free -th
- sar
- uptime

快速分析-监控体系

Grafana监控-系统概述

Grafana监控-CPU

CPU 90%+：top -H + jstack

线程上下文切换/锁竞争激烈

死循环：HashMap
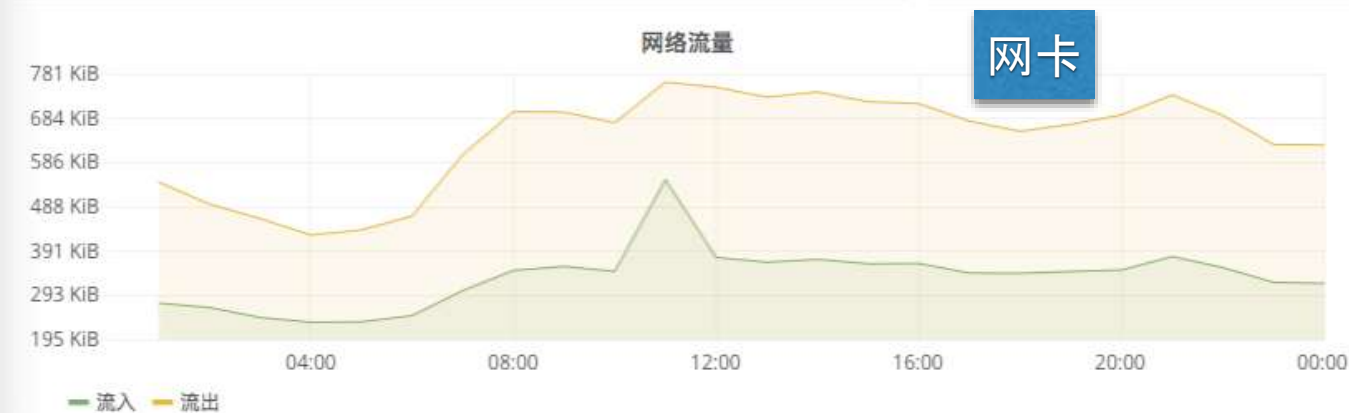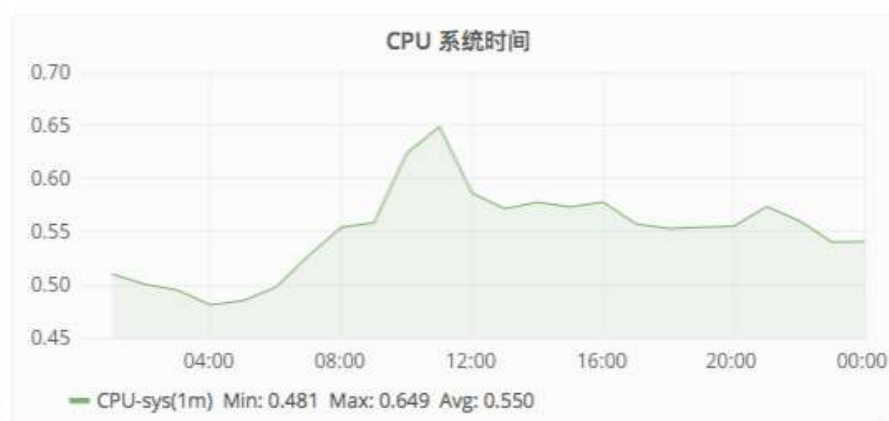
Grafana监控-内存

Grafana监控-网络

返回数据是否过大

搞活动请求量巨大，网卡被打满
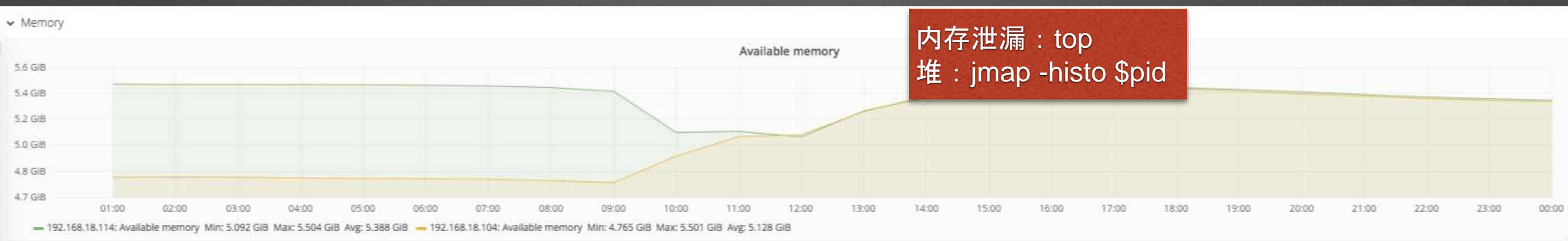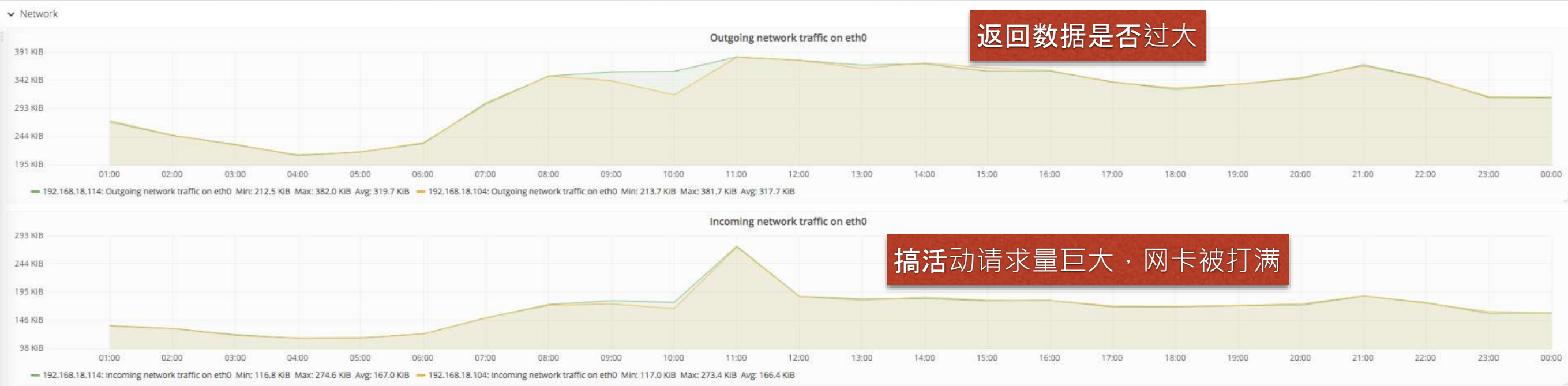
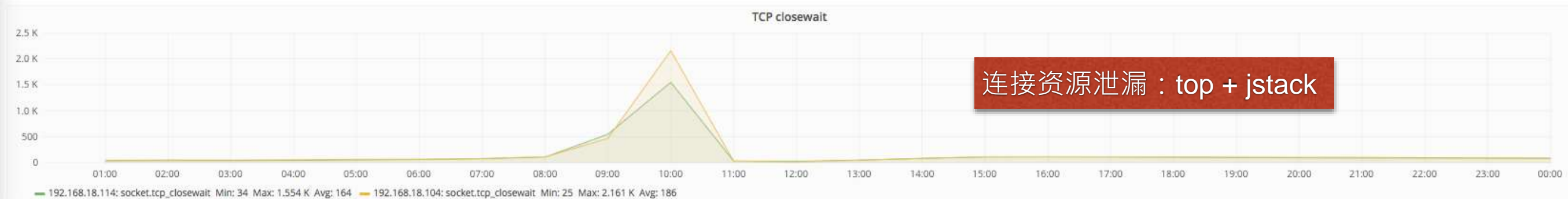# Grafana监控-磁盘

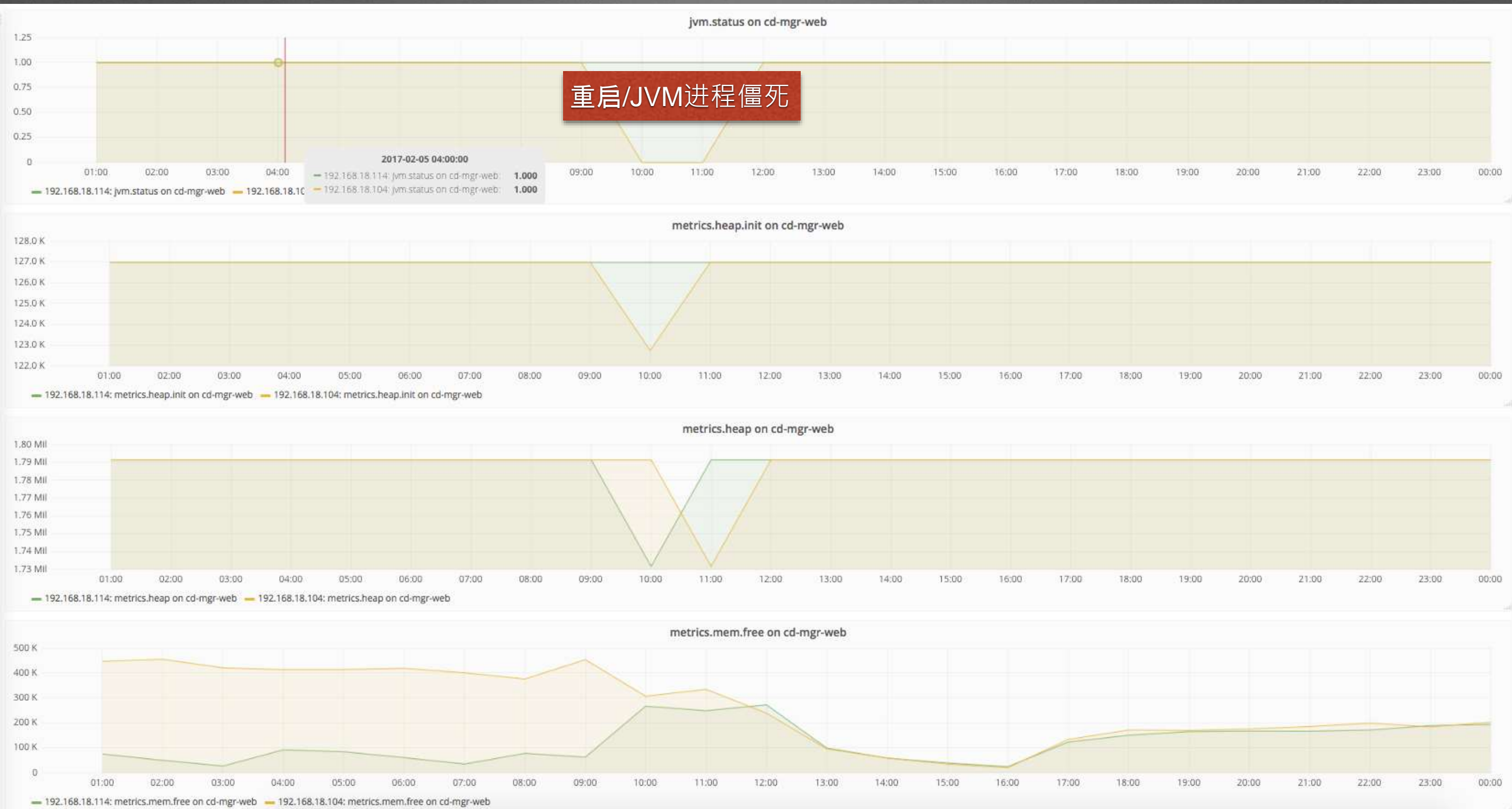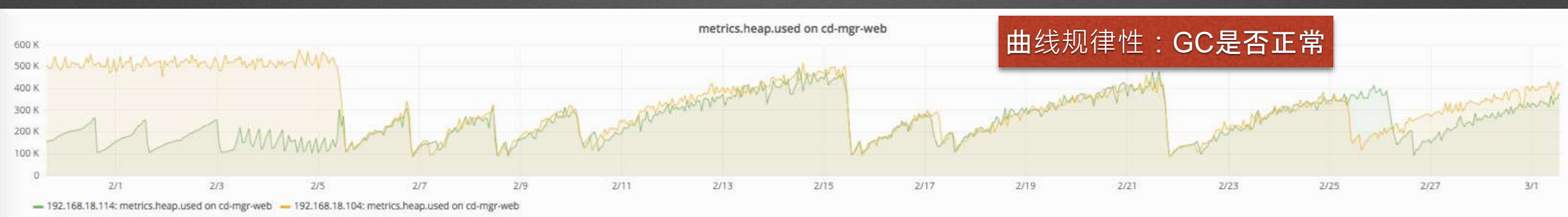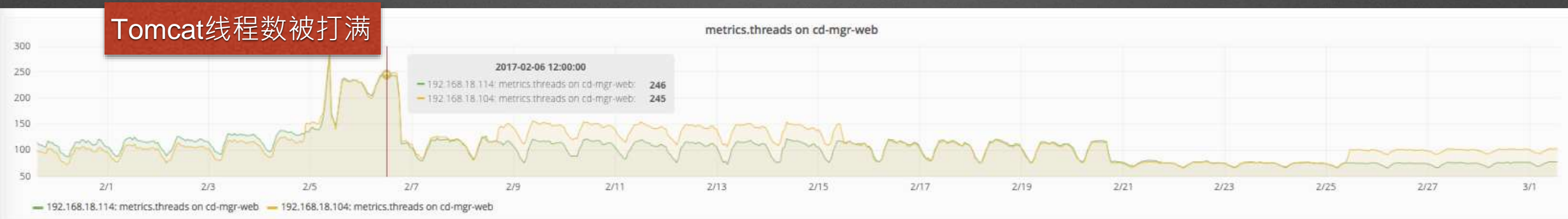# Grafana监控-TCP状态
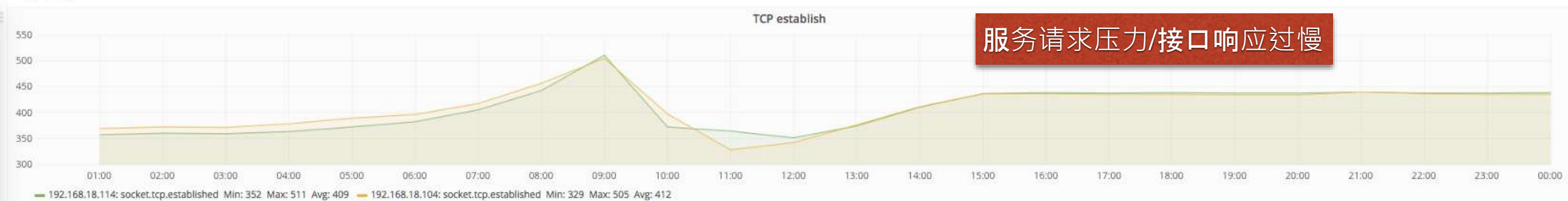
Grafana监控-JVM

Grafana监控-GC

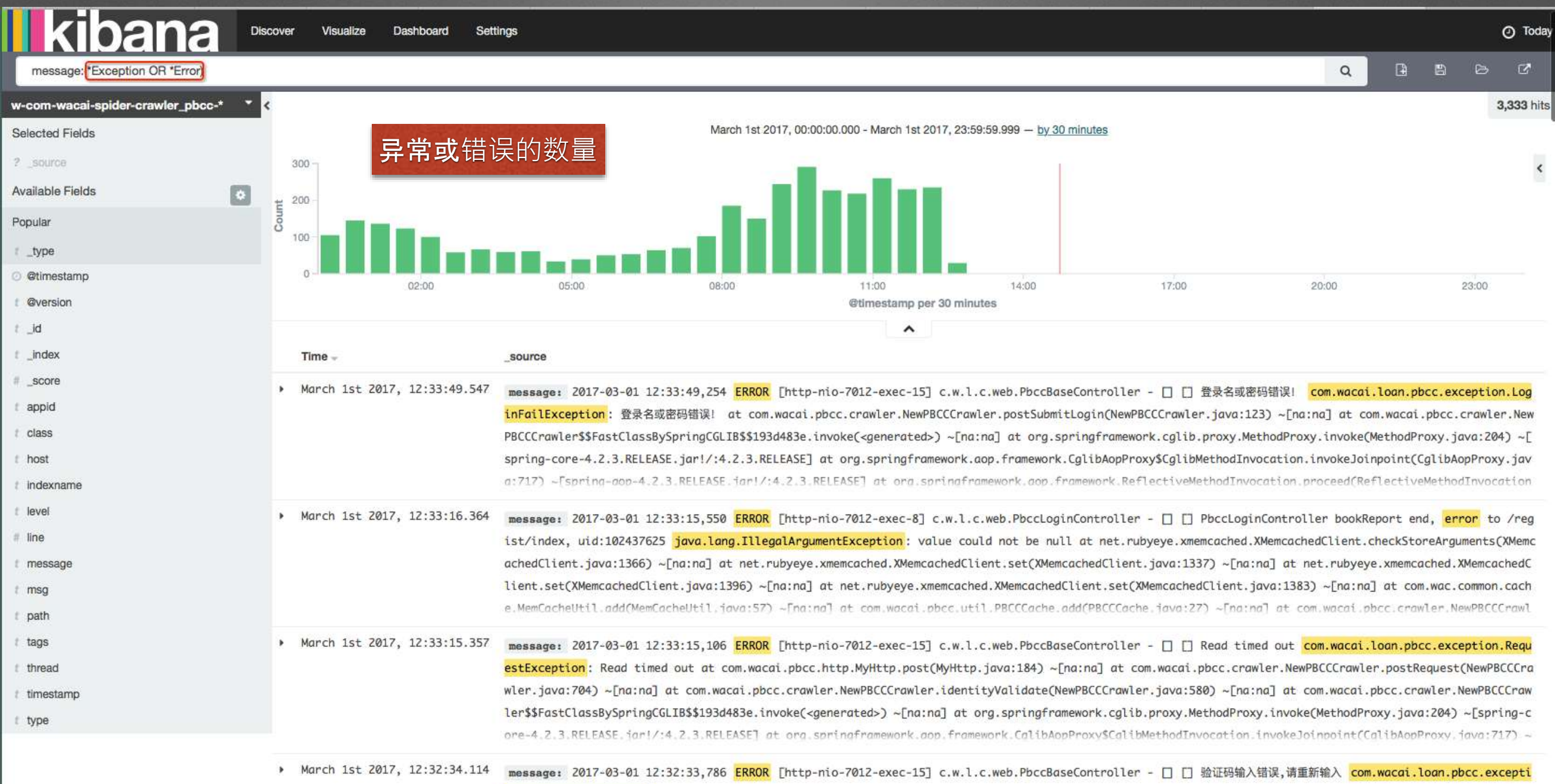# Grafana监控-Tomcat

Kibana-日志查询

重启线上服务器

- [Obelisk - 一键发布/部署平台](#)

线下定位问题代码

- IBM Thread and Monitor Dump Analyze for Java: jstack

- Eclipse Memory Analyzer (MAT) - Java heap analyzer: jmap

- BTrace - dynamic tracing tool for Java: 在线定位

- cat netstat.dump | awk '/^tcp/ {++S[$NF]} END {for(a in S) print a, S[a]}'

Thread Dump List

Thread Status Analysis

常见问题

- 连接资源泄漏：连接超时未设置

  - TCP CLOSE_WAIT + top + jstack

- CPU高：死循环之HashMap

  - top -H + jstack

- 内存泄漏：

  - jmap

"敬畏线上的任何异常。"

–*Johnny Appleseed*

感谢同行的工作

- JDK Tools and Utilities

- Linux Performance Analysis and Tools - Brendan Gregg

- Java常见问题排查 - 毕玄（BlueDavy，林昊）

- 高性能的Java代码编写及常见问题排查 - 毕玄

- Java线上应用问题排查方法和工具 - 空望

- IBM Thread and Monitor Dump Analyze for Java

- Eclipse Memory Analyzer (MAT)

- BTrace - a safe, dynamic tracing tool for the Java platform

Q&A

Thanks!