

Manage Servers On The Cloud with OpenSource Tools

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#JCCConf

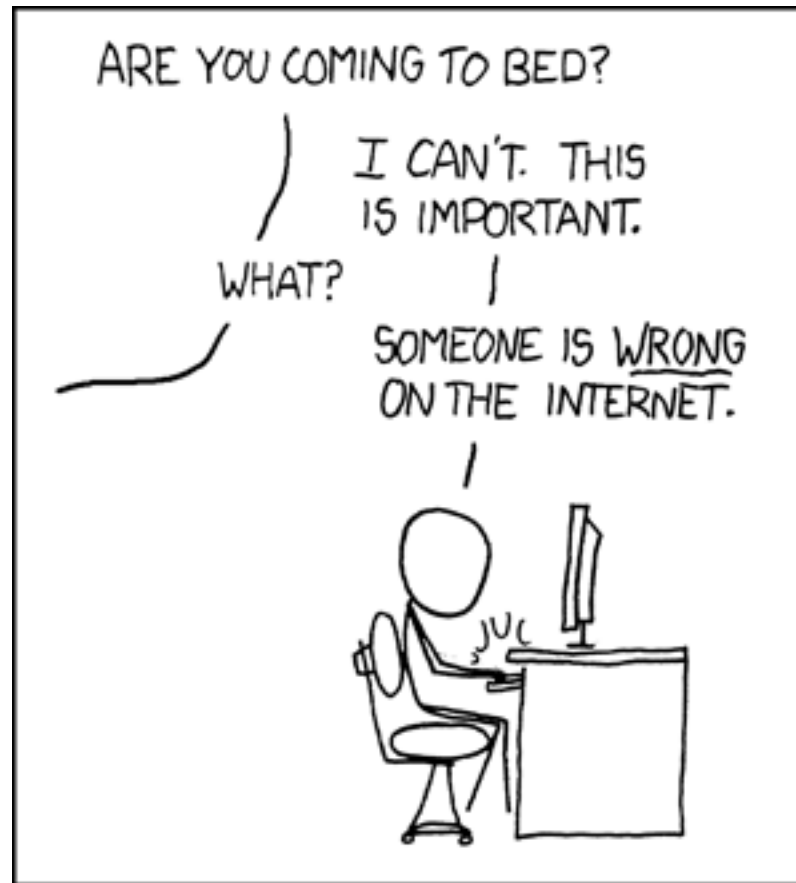
JCCConf Taiwan 2014

議程

- 為什麼我們需要監控、測量
- 有什麼指標需要監控、測量
- 有什麼工具可以幫助我們
 - metrics by codahale
 - RRD Tools

請誠實的回答這個問題

你一天睡幾個小時？

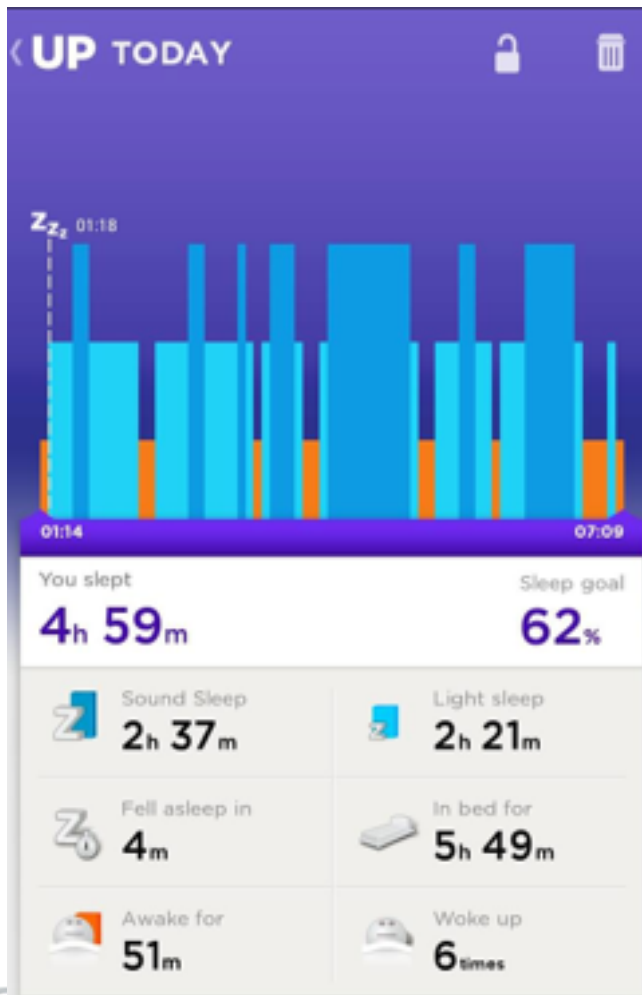


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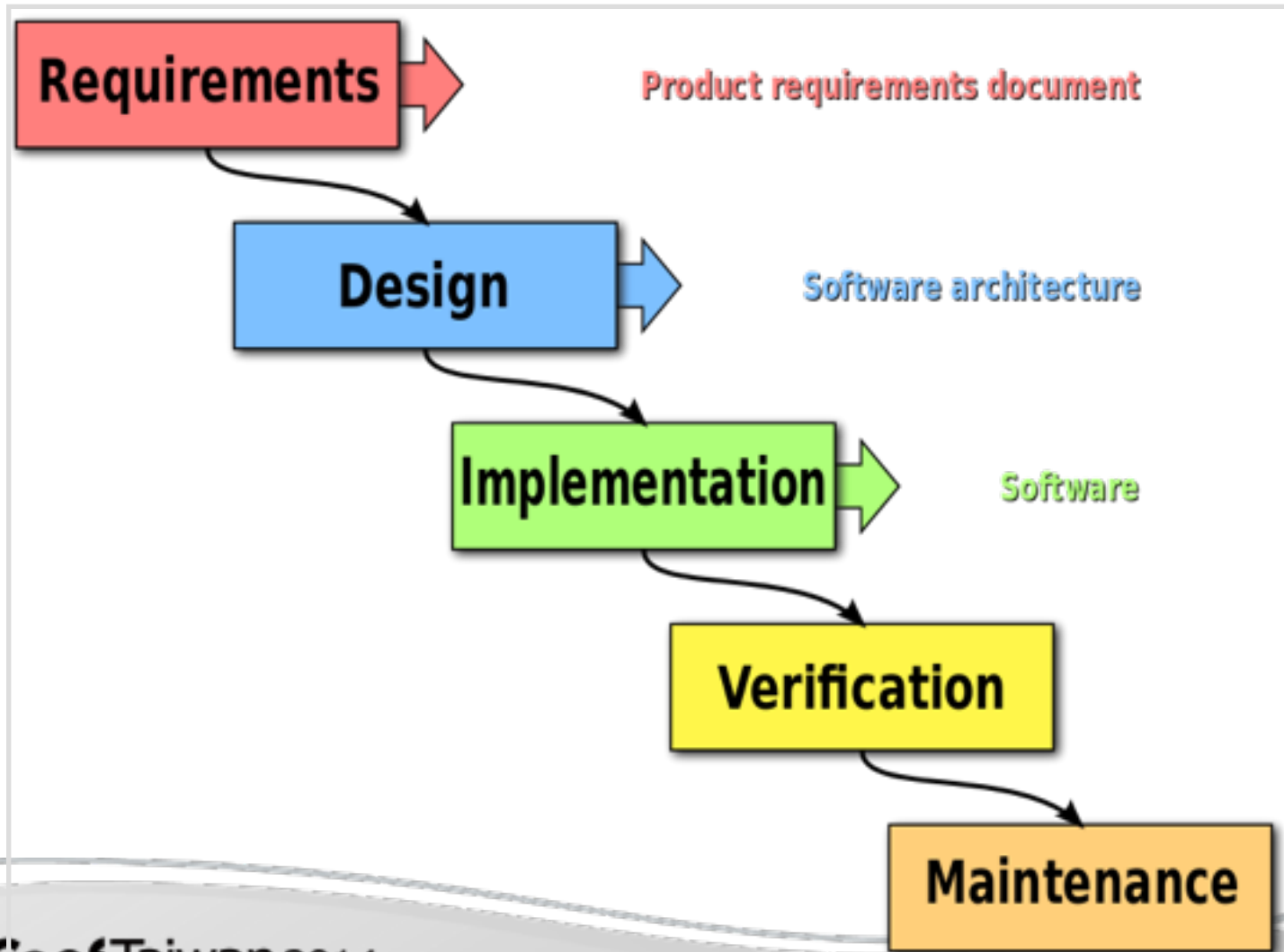


現實往往比你想像的殘酷

誠實的面對自我，是改善的開始

如果我們對自身的認知都有誤差，
那我們寫的軟體呢？

Software Lifecycle

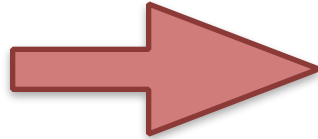


營運上的狀況

- 大量流量湧入
- 上百天的運行
- 資料庫備份
- 外部服務(SOA, Micro-Service)問題
- 換新硬體

營運上的狀況

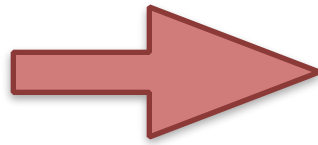
- 大量流量湧入
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- Throughput
- Response time
- worst case RT

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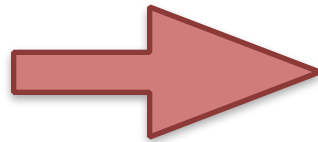
- Memory Leak
- Cache Usage(Hit/Miss)
- JVM Heap size

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- 
- performance?

營運上的狀況

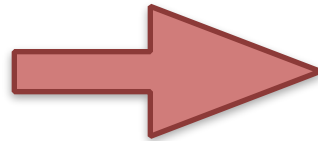
- 大量流量湧入
- 上百天的運行
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- Availability
- Reliability
- Response Time
- Downtime
- Maintenance Schedule.

營運上的狀況

- 大量流量湧入
- 上百天的運行
- 資料庫備份
- 外部服務問題
- 換新硬體
- 評估新硬體需求
- 新的系統參數



Metrics By Codahale



Mind The Gap!

Gauges

- 記錄當下的值

```
Metrics.newGauge(QueueManager.class, "pending-jobs",  
    new Gauge<Integer>() {  
        @Override  
        public Integer value() {  
            return queue.size();  
        }  
    }  
));
```

Counter

```
private final Counter pendingJobs =  
    Metrics.newCounter(QueueManager.class,  
        "pending-jobs");  
  
public void addJob(Job job) {  
    pendingJobs.inc();  
    queue.offer(job);  
}  
  
public Job takeJob() {  
    pendingJobs.dec();  
    return queue.take();  
}
```

Meter

- 記錄存取的速率

```
private final Meter requests =  
    Metrics.newMeter(RequestHandler.class,  
        "requests",  
        "requests",  
        TimeUnit.SECONDS);  
  
public void handleRequest(Request request, Response  
response) {  
    requests.mark();  
    // etc  
}
```

Histograms

- 記錄資料的統計分析、分佈

minimum

75 percentile

maximum

95 percentile

mean

98 percentile

standard deviation

99 percentile
99.9 percentile

Histograms

```
private final Timer responses = Metrics.newTimer(  
    RequestHandler.class,  
    "responses",  
    TimeUnit.MILLISECONDS,  
    TimeUnit.SECONDS);
```

```
public String handleRequest(Request request, Response  
response) {  
    final TimerContext context = responses.time();  
    try {  
        // etc;  
        return "OK";  
    } finally {  
        context.stop();  
    }  
}
```

Histograms 特異功能

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$$

where

σ = *the standard deviation*

x = *each value in the population*

\bar{x} = *the mean of the values*

N = *the number of values (the population)*

Histograms 特異功能

Data Points: 1,000 req/sec * 60 * 60 * 24 = 691,200,000 or 5 GB

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$$

where

σ = *the standard deviation*

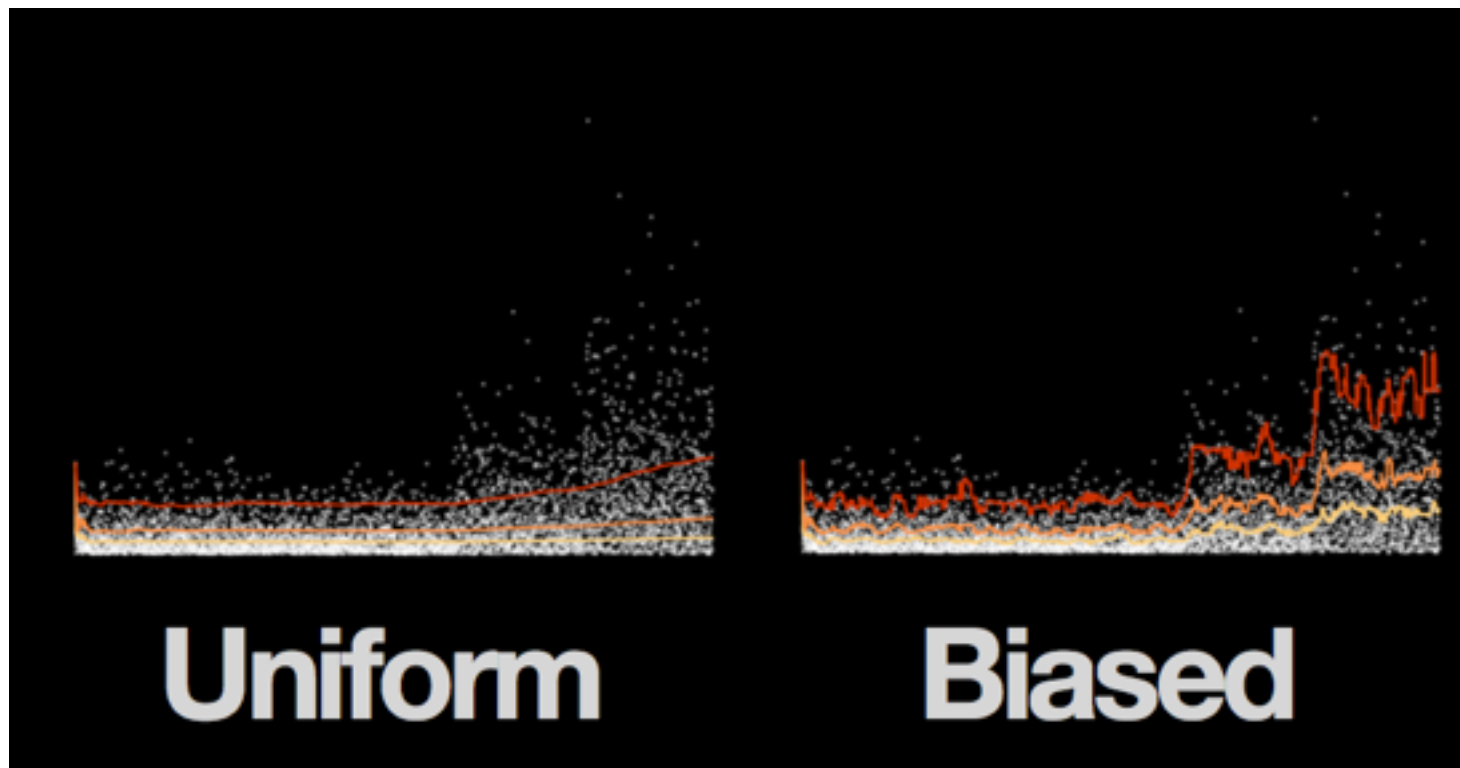
x = *each value in the population*

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Histograms 特異功能

- 採樣往五分鐘內的事件偏斜



ref: <http://codahale.com/codeconf-2011-04-09-metrics-metrics-everywhere.pdf>

有了這些資料後我們要怎麼用呢？

~~JMX~~ interface

json interface

```
"jvm" : {  
  "vm" : {  
    "name" : "Java HotSpot(TM) 64-Bit Server VM",  
    "version" : "1.6.0_45-b06"  
  },  
  "memory" : {  
    "totalInit" : 8.5761344E7,  
    "totalUsed" : 8.4700376E7,  
    "totalMax" : 1.087111168E9,  
    "totalCommitted" : 1.16129792E8,  
    "heapInit" : 6.1447488E7,  
    "heapUsed" : 2.876592E7,  
    "heapMax" : 9.50796288E8,  
    "heapCommitted" : 5.9834368E7,  
    "heap_usage" : 0.030254556483922664,  
    "non_heap_usage" : 0.4103368905874399,  
    "memory_pool_usages" : {  
      "Code Cache" : 0.058741251627604164,  
      "Eden Space" : 0.0375141103764524,  
      "Perm Gen" : 0.6161499953851467,  
      "Survivor Space" : 0.003552734375,  
      "Tenured Gen" : 0.028688572989019088  
    }  
  }  
}
```

json interface

```
"daemon_thread_count" : 17,  
"thread_count" : 74,  
"current_time" : 1415698443730,  
"uptime" : 20471620,  
"fd_usage" : 0.0013427734375,  
"thread-states" : {  
  "timed_waiting" : 0.7837837837837838,  
  "blocked" : 0.013513513513513514,  
  "runnable" : 0.16216216216216217,  
  "waiting" : 0.04054054054054054,  
  "new" : 0.0,  
  "terminated" : 0.0  
},
```

```
"garbage-collectors" : {  
  "MarkSweepCompact" : {  
    "runs" : 5,  
    "time" : 946  
  },  
  "Copy" : {  
    "runs" : 268889,  
    "time" : 498572  
  }  
}  
  
"application.info" : {  
  "version" : {  
    "type" : "gauge",  
    "value" : "1.2.0-20140319-SNAPSHOT"  
  }  
},
```

json interface

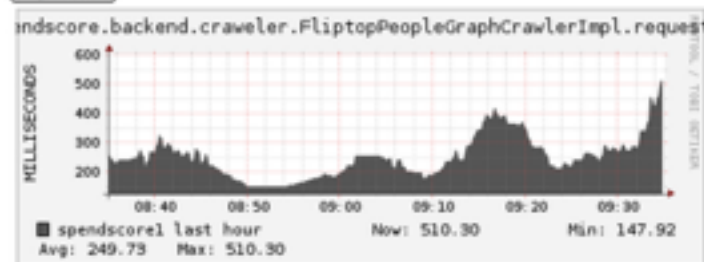
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畫圖

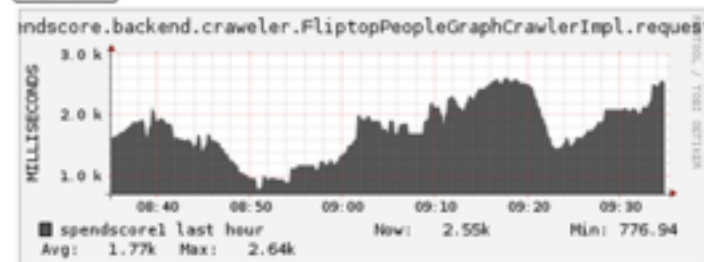
com.flitop.spendscore.backend.crawler.FliptopPeopleGraphCrawlerImpl.requests.75percentile [CSV](#) [JSON](#) [Inspect](#) [Trend](#)

[Hide/Show Events](#)



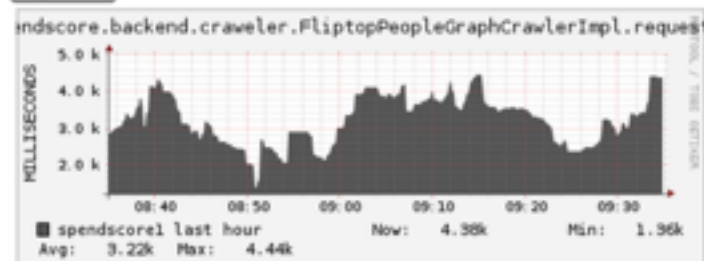
com.flitop.spendscore.backend.crawler.FliptopPeopleGraphCrawlerImpl.requests.95percentile [CSV](#) [JSON](#) [Inspect](#) [Trend](#)

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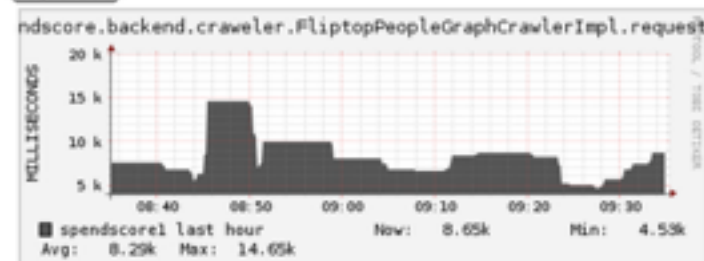
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com.flitop.spendscore.backend.crawler.FliptopPeopleGraphCrawlerImpl.requests.max [CSV](#) [JSON](#) [Inspect](#) [Trend](#) [Hide/Show Events](#)

Q&A