



ORACLE® Aconex

EVENT TRACING @ ACONEX

INTRODUCTION

- Principal Architect @ Oracle - Construction & Engineering GBU (CEGBU)
- An Engineer who's had his coding license taken away?
- Draw boxes on whiteboards & wave my hands about?
- PCP user & fan for ~14 years



OUTLINE

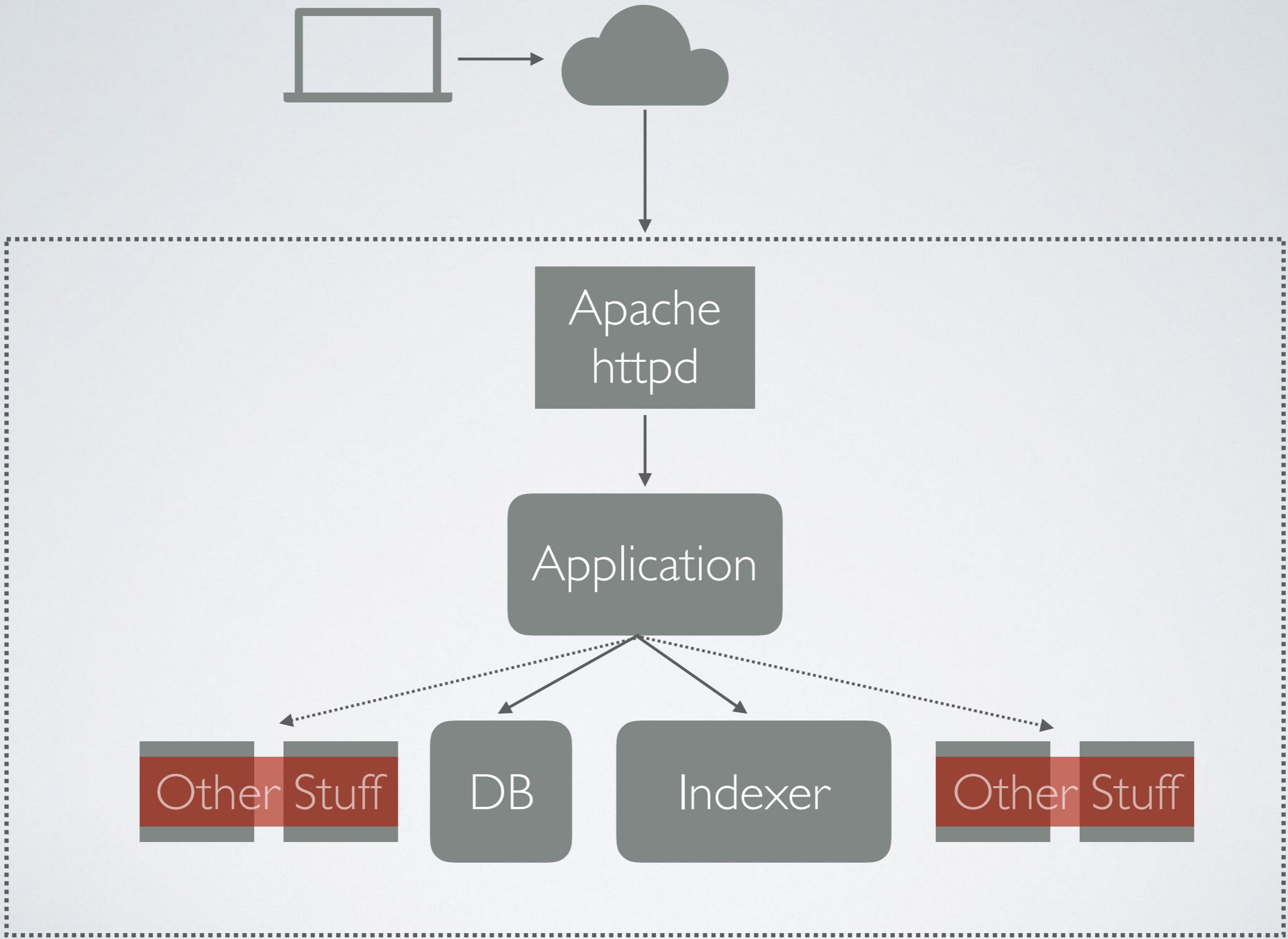
- Key Problems we faced
- How PCP & Parfait help us
- Where PCP & Parfait fit into the broader monitoring suite

ASSUMPTIONS

- Have an understanding of PCP
- Some understanding of Java

ACONEX TECH STACK





TERMINOLOGY



Project



AECOM



MULTIPLEX
Built to outperform.



User

Organization

CONTROLLER

- Servlet Main-entry point for requests
- Groups related Actions together
- Often linked to a particular screen within our application
- e.g. Document Search page - /SearchDocuments



ACTION

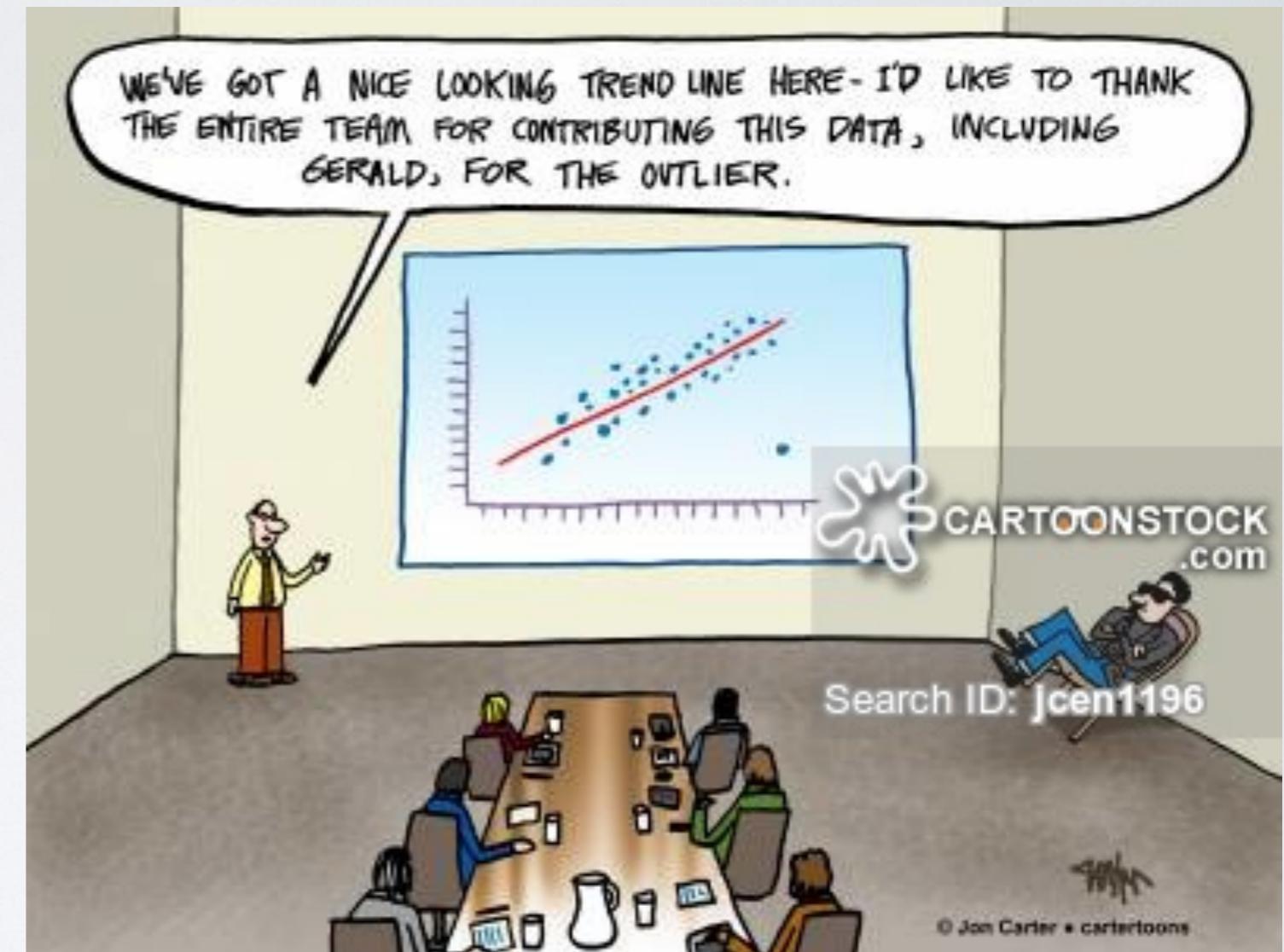
- Specific user-initiated request from a particular screen
- e.g. zippedDownload
- Some actions are quick & cheap... others not so much...



PROBLEMS

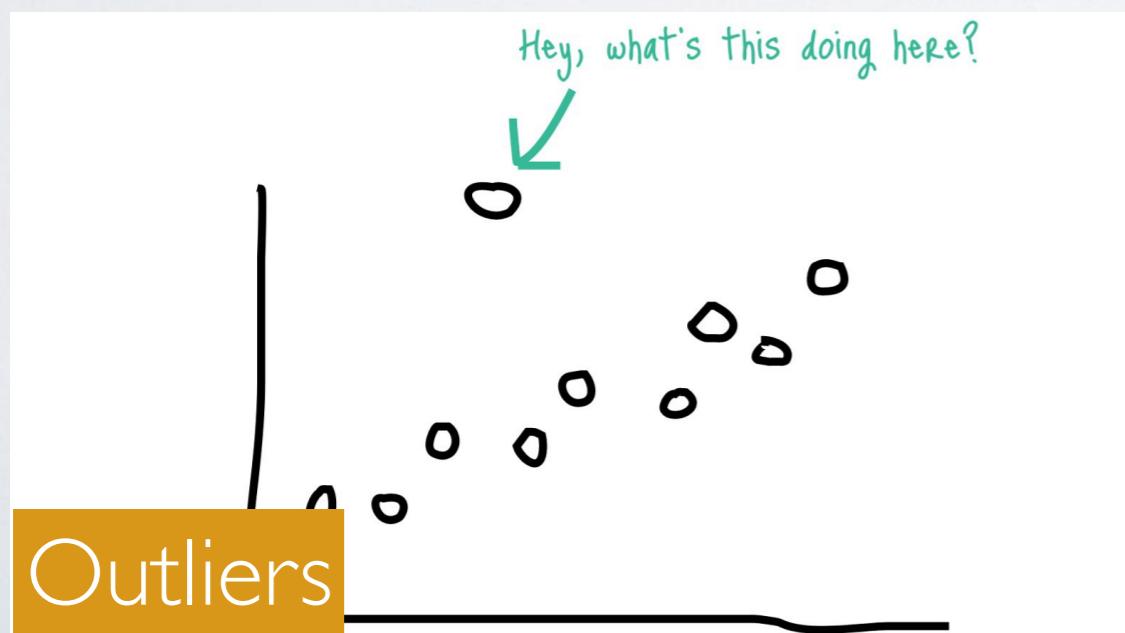
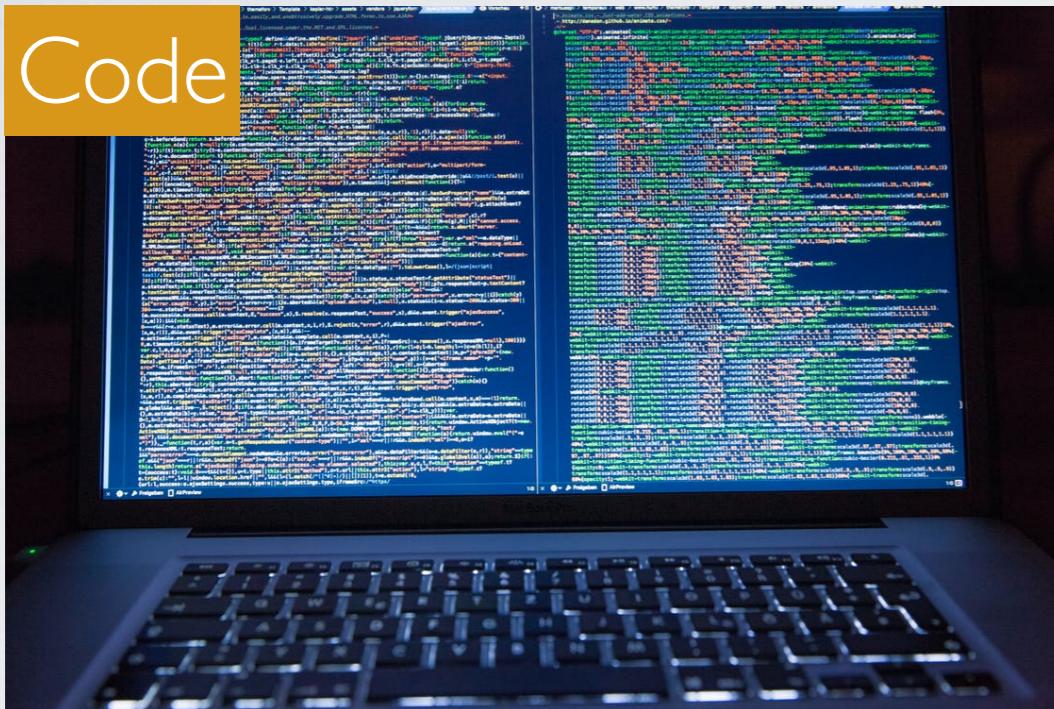


Averages

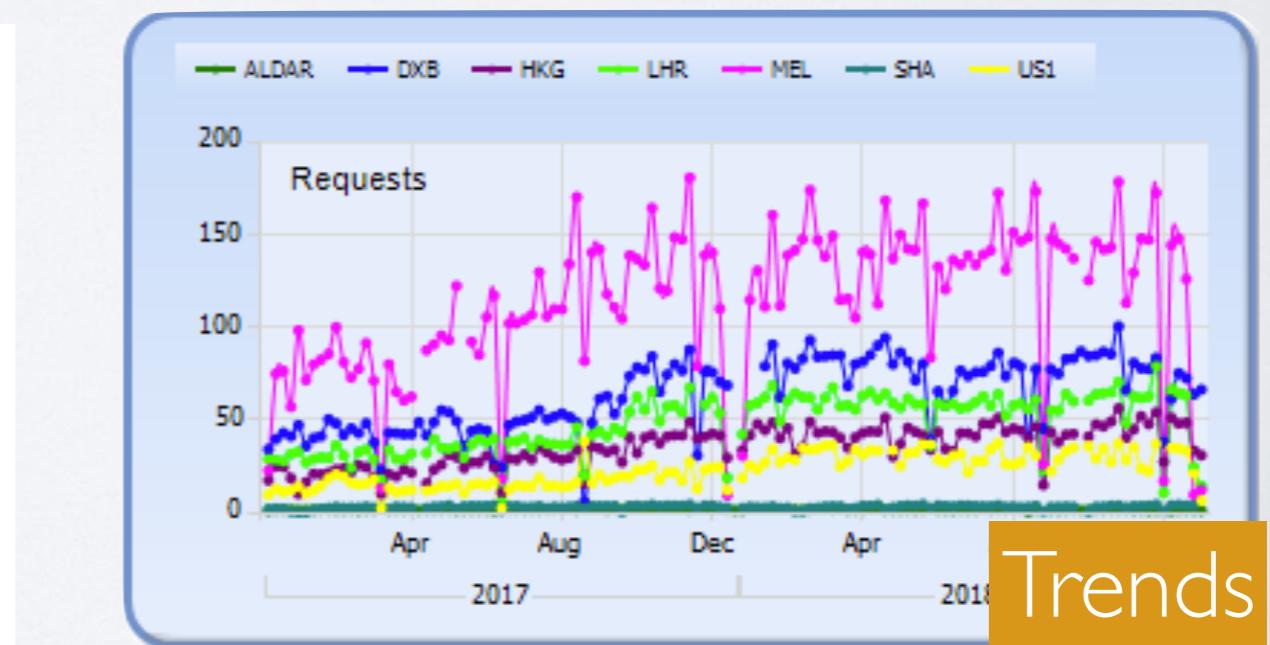


Outliers

WHAT DID WE TRY TO ACHIEVE?



Outliers



SO HOW DO WE DO IT?

Code

PER-CONTROLLER METRICS

- Each Controller is an Instance Domain string
- Resource-specific Counters
 - Elapsed Time
 - CPU
 - Database
 - Heap
 - Service Calls

```
aconex.controllers.utime["mel/SearchDocuments"]  
aconex.controllers.db.count["mel/SearchDocuments"]
```

...

Code 

Users

& other Segmentations

POPULATION SEGMENTATION

- Users
- Projects
- Threads & Thread Pools
- IP Addresses

LOG4J

- Thread name
- MDC - Mapped Diagnostic Context
- Each Request - UserId, ProjectId is populated

[2019-02-27 11:49:34,790 INFO] [it.timing.LoggerSink]
[**tid=http-general-246936**,
rid=XHXenlcxTsaBgQao63SSVwAAA-0, rgi=,
ip=120.22.220.1,uid=1476736294, pid=26905] |

REQUESTS

- Each Request is mapped to a Controller & Action
- Executed by a Thread within the JVM
- Each Thread can have a name
- Threads belong to Thread Pools which have a common Prefix - e.g. http-extapi-123

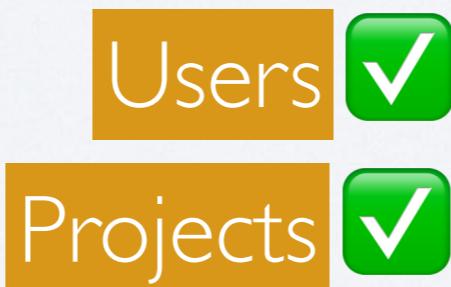
PER-THREAD ACCOUNTING

- JVM
 - ManagementFactory.getThreadMXBean()
- Parfait
 - ThreadMetric
 - EventTimer
 - EventMetricCollector.startTiming(...)

PARFAIT

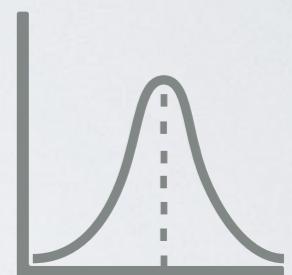
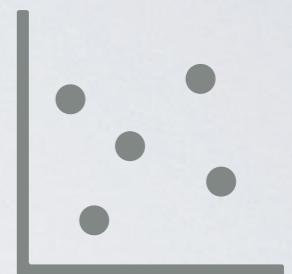
- StandardThreadMetrics – set of standard per-thread JVM/OS Metrics (Elapsed, CPU, Heap)
- LoggerSink – log4j output at the end of the Request cycle

```
[2019-02-27 11:49:34,790 INFO ][it.timing.LoggerSink]  
[tid=http-  
general-246936,rid=XHXenlcxTsaBgQao63SSVwAAA-0,rgi=,ip  
=120.22.220.1,uid=1476736294,pid=26905] || Top  
mailThreadBffController:getMailThread  
mailThreadBffController:getMailThread Elapsed time:  
own 323.622595 ms, total 323.623111 ms Total CPU: own  
2.688965 ms, total 2.692129 ms User CPU: own 0.0 ms,  
total 0.0 ms System CPU: own 2.774263 ms, total  
2.854661 ms Heap Bytes: own 136184 By,....
```

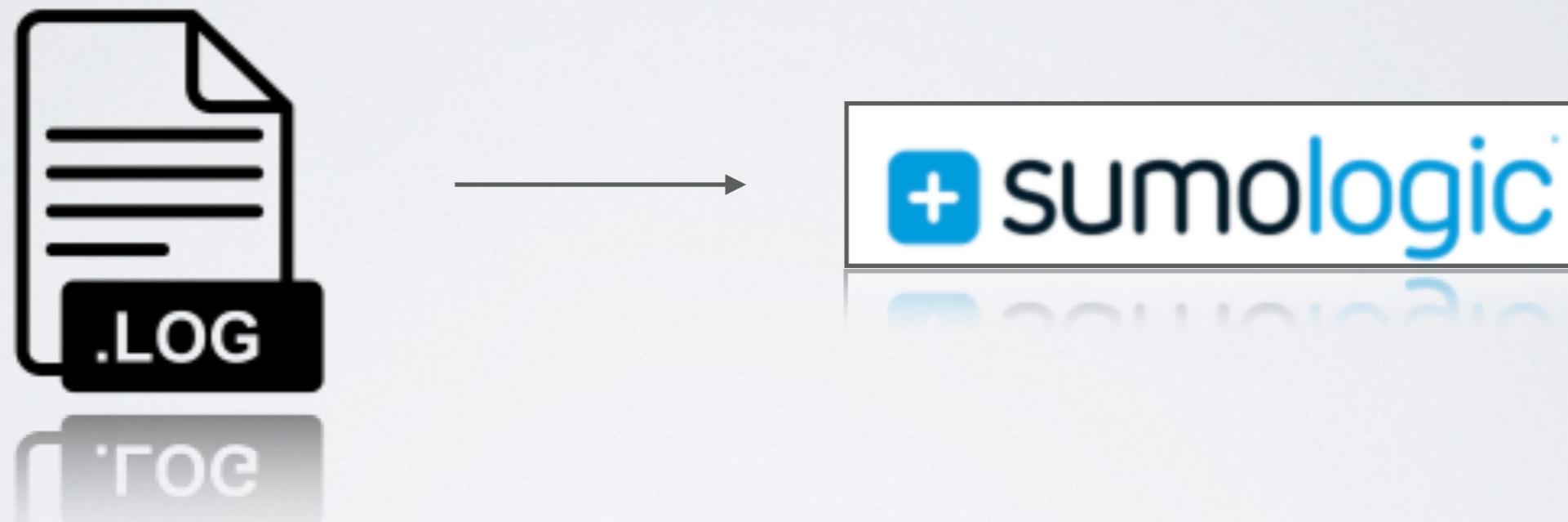


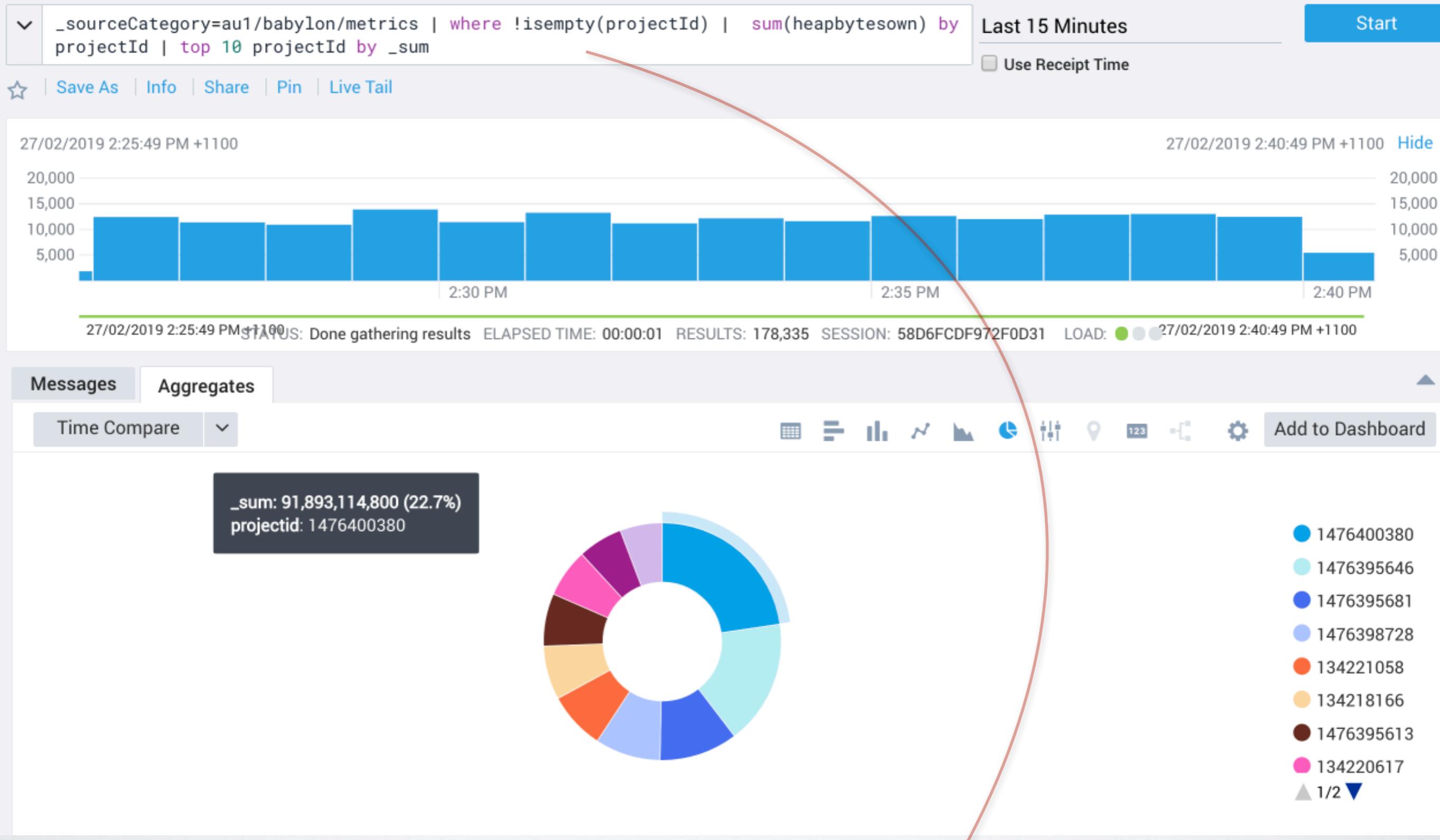
AGGREGATIONS

- We have the raw data & taxonomy
- Aggregate / Summaries
- Original/OldSchool: sed/grep/awk
- Modern: Sumologic

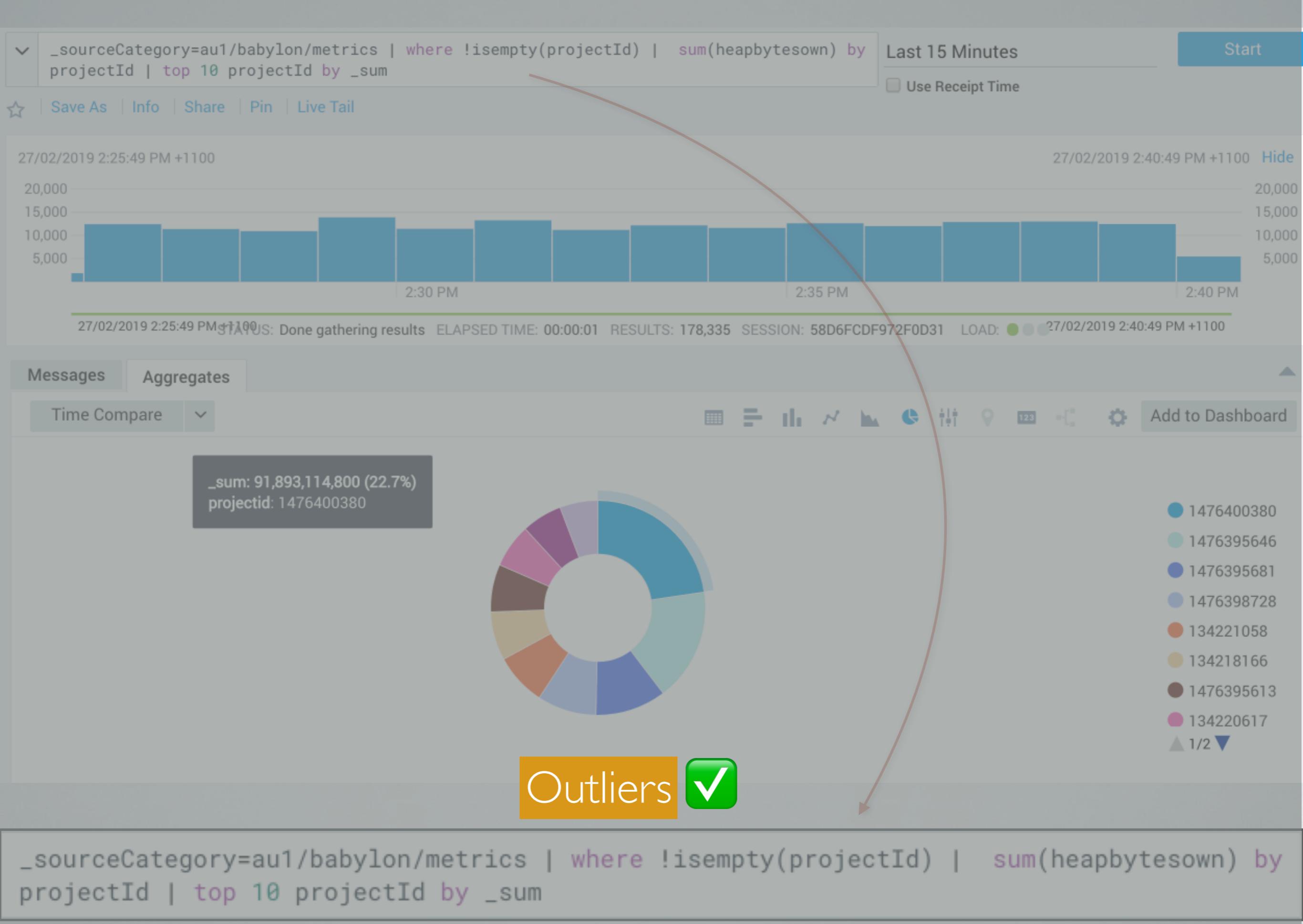


SHORT TERM ANALYSIS



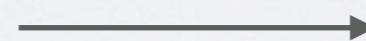


`_sourceCategory=au1/babylon/metrics | where !isempty(projectId) | sum(heapbytesown) by projectId | top 10 projectId by _sum`



TRENDING

PCP
Archives



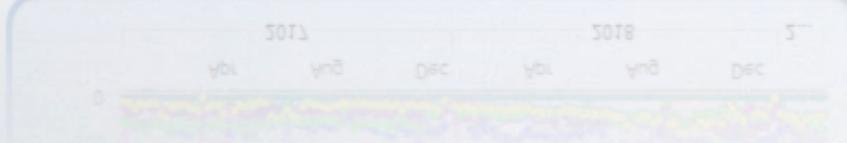
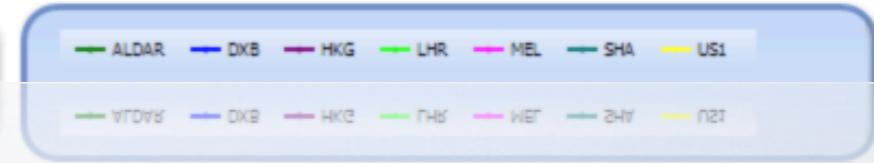
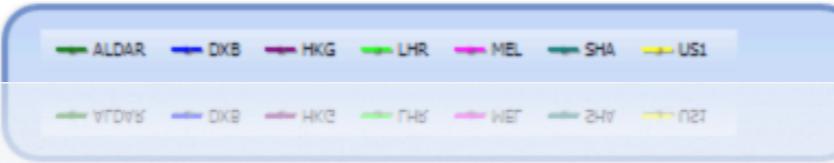
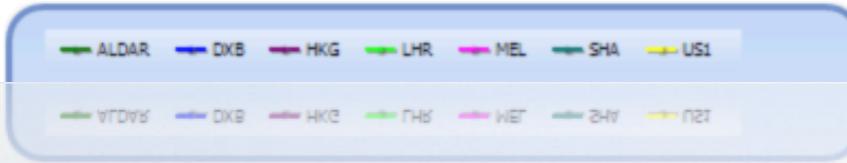
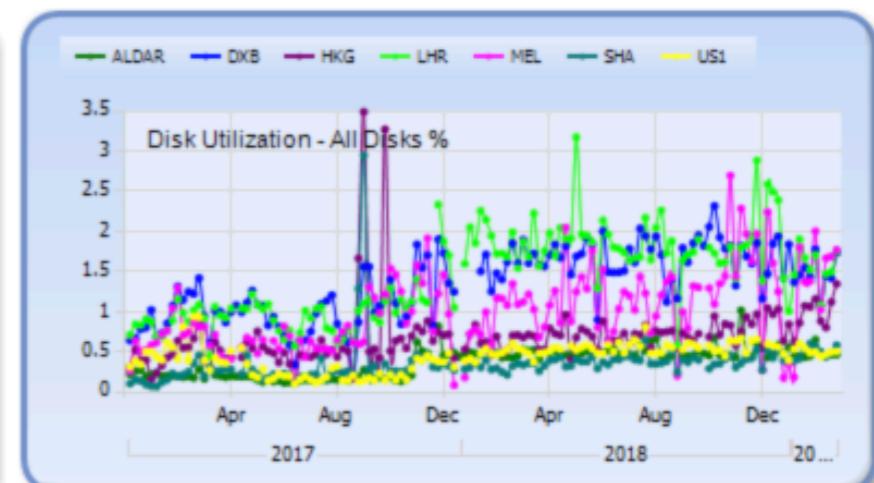
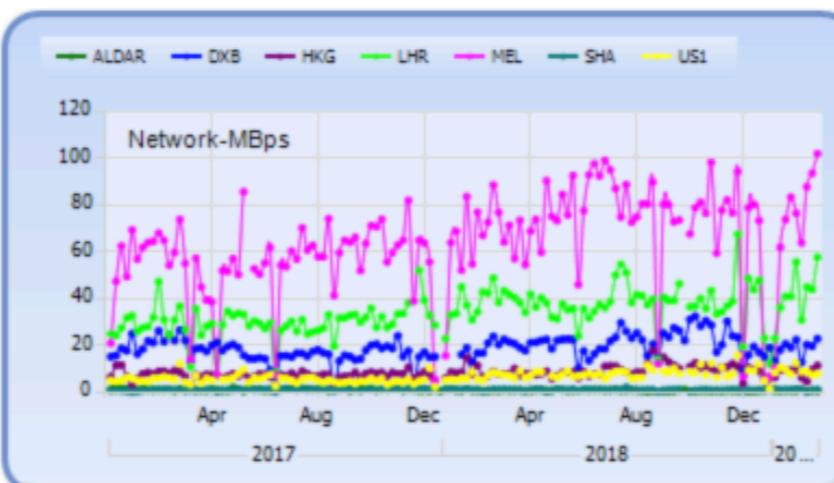
TRENDING

- Daily sync of PCP archives to central Repo
- Extract, Transform, Load (ETL) into SQL Server
- Metric values mapped into STAR schema
- SQL Server Analysis Reporting

Year Instancecode
 Month Measure Name

1 of 2 ? Find | Next

Application Server



SUMMARY



Problems



PCP & Parfait



Bigger Picture



THANK YOU