



Prometheus Is Good for
Your Small Startup

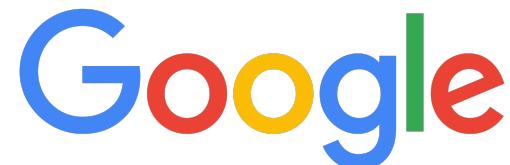
ShuttleCloud Corp. 2016

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@carretops

@ShuttleCloud
@ShuttleCloudEng

ShuttleCloud

- Techstars 2011
- Chicago & Madrid
- Email & contacts import API
- ISPs and email & address book providers



ShuttleFacts

- Gmail: 3 million users with our API
- High availability HA SLA 99.5%
- 6 TB/h
- +12k migrations per day
- ~12 million emails per day
- ~2.5 million contacts per day
- 24/7 providers around the world



What to expect from this presentation

- Disclaimers
- In the beginning...
- A new dawn
- Middle Ages
- Modern History
- Back to the Future

Disclaimers

Disclaimer #1



Disclaimer #2



Disclaimer #3



In the beginning...

(What we had)

Automatic Scripts

```
00-ALERTS Cron <ubuntu@monitor> (cd checks; ./output_on_error ./run_playbook check_
```

Pingdom

Uptime Checks

Pause Delete By status Last 24 hours Filter Add new Monitor my website

Tags... Showing 10 of 10 checks Search...

| | | | | | | | |
|--------------------------|--|--|------|--------|------|---------------------|------------------------|
| <input type="checkbox"/> | | | TCP | 100% | 2 mo | 84 ms 0 min | <input type="button"/> |
| <input type="checkbox"/> | | | TCP | 100% | 1 mo | 91 ms 0 min | <input type="button"/> |
| <input type="checkbox"/> | | | HTTP | 99.86% | 19 h | 493 ms 2 minutes | <input type="button"/> |

Dashboard



roboduck

00-ALERTS

Ducksboard ALERT: Success is below 100.0 -

roboduck

00-ALERTS

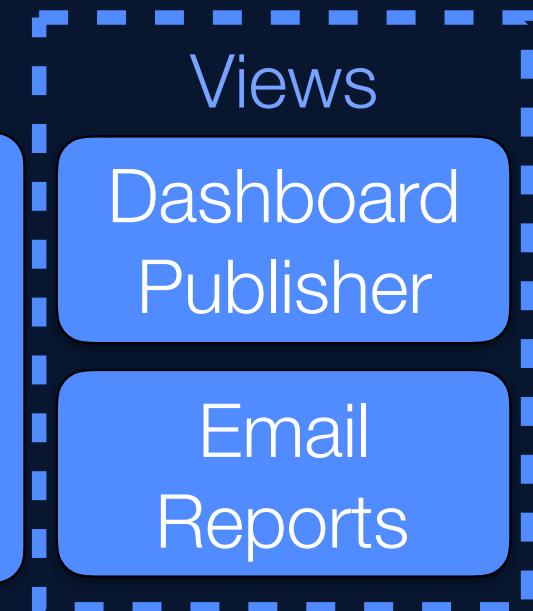
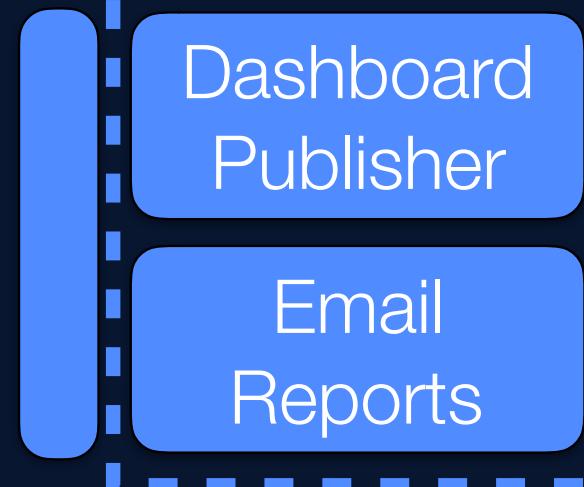
Ducksboard ALERT: Success is below 100.0 -

Status Importer

Status DB



Status
Importer





I DON'T KNOW WHAT I'M SUPPOSED
TO BE DOING

AND AT THIS POINT I'M TOO
AFRAID TO ASK

memegenerator.net

A new dawn

(New metric and alert systems)



Why Prometheus?

- Metrics have labels - flexibility (can be added/changed)
- No need of external services (i.e. Sensu with RabbitMQ)
- Service Discovery from our DNS
- Easy to install and test

Some first steps

- Bronze Age: The targets were statically fed using Ansible
- Iron Age: DNS service discovery
- Operations Metrics from node_exporter
- Others using textfile in node_exporter:

```
# HELP couchdb_replication_active Is CouchDB continuous replication in status
# TYPE couchdb_replication_active gauge
couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
```

Some first alerts

- Only Operations Alerts:
 - Hard drive usage
 - InstanceDown
- Absolute thresholds →
 - HD 85% capacity — Send email
 - HD 90% capacity — Page



it's something

Middle Ages

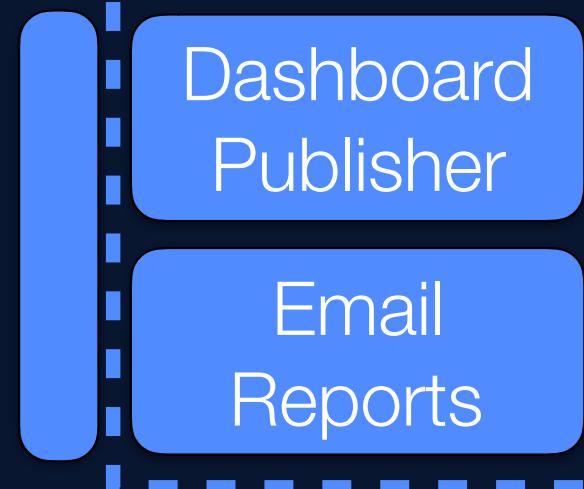
(Business Metrics: Operation Exporter)

Status Importer

Status DB

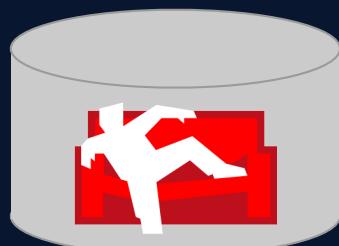


Status
Importer

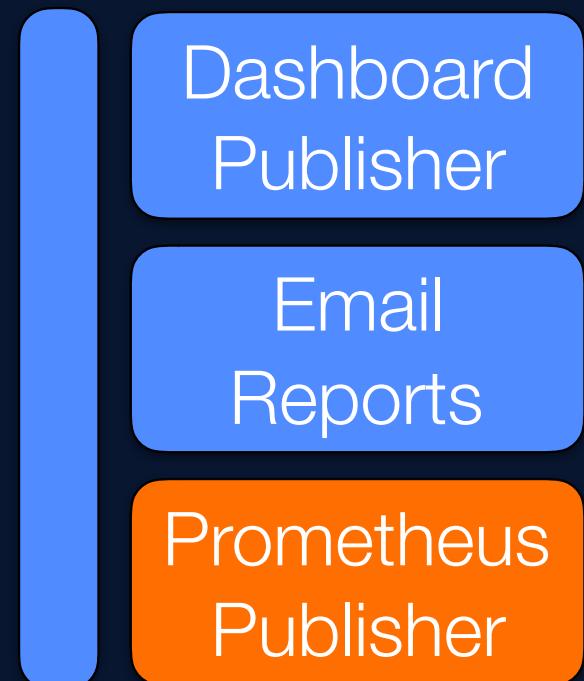


Replicating behaviour

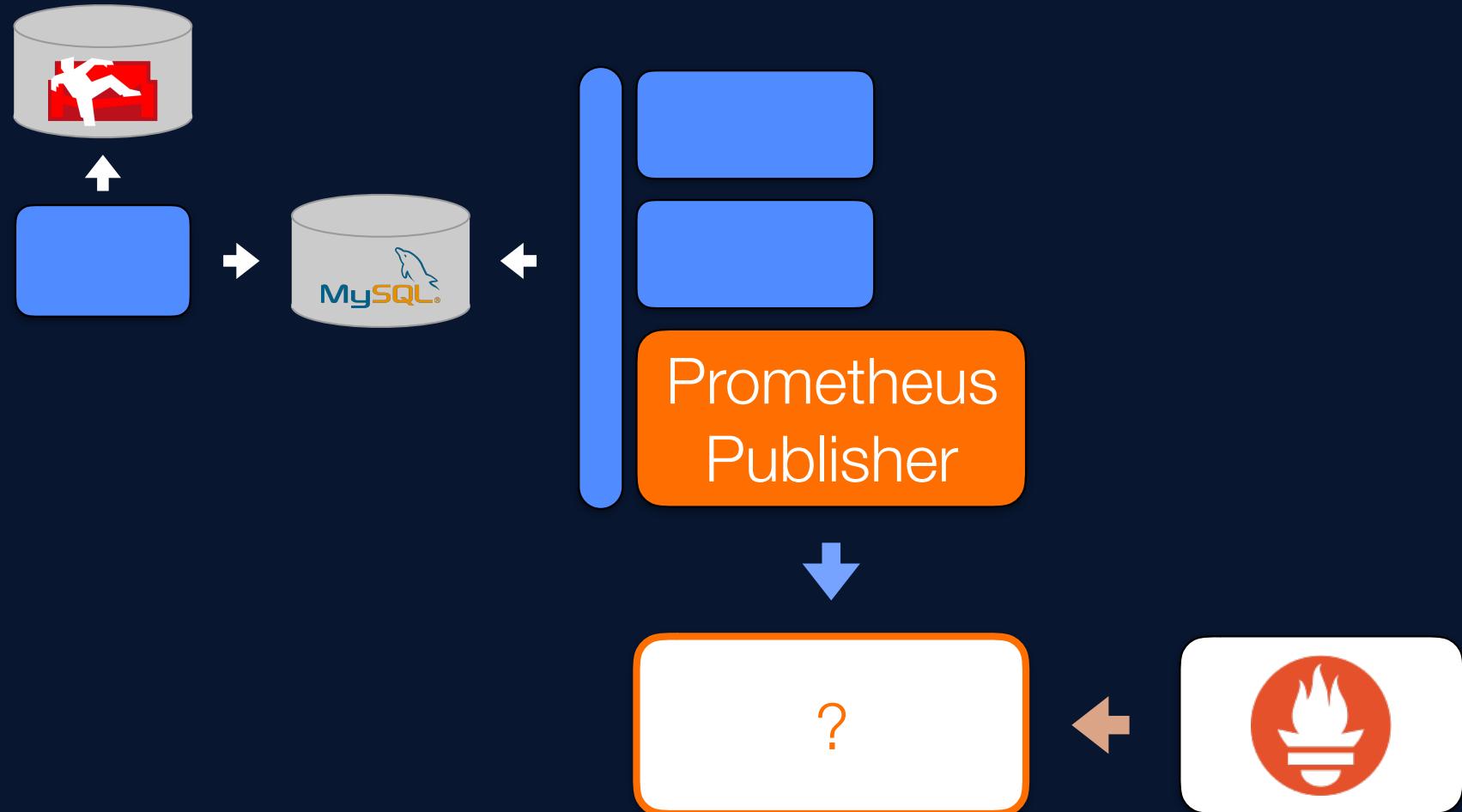
Status DB



Status Importer



Push vs Pull



Push Gateway



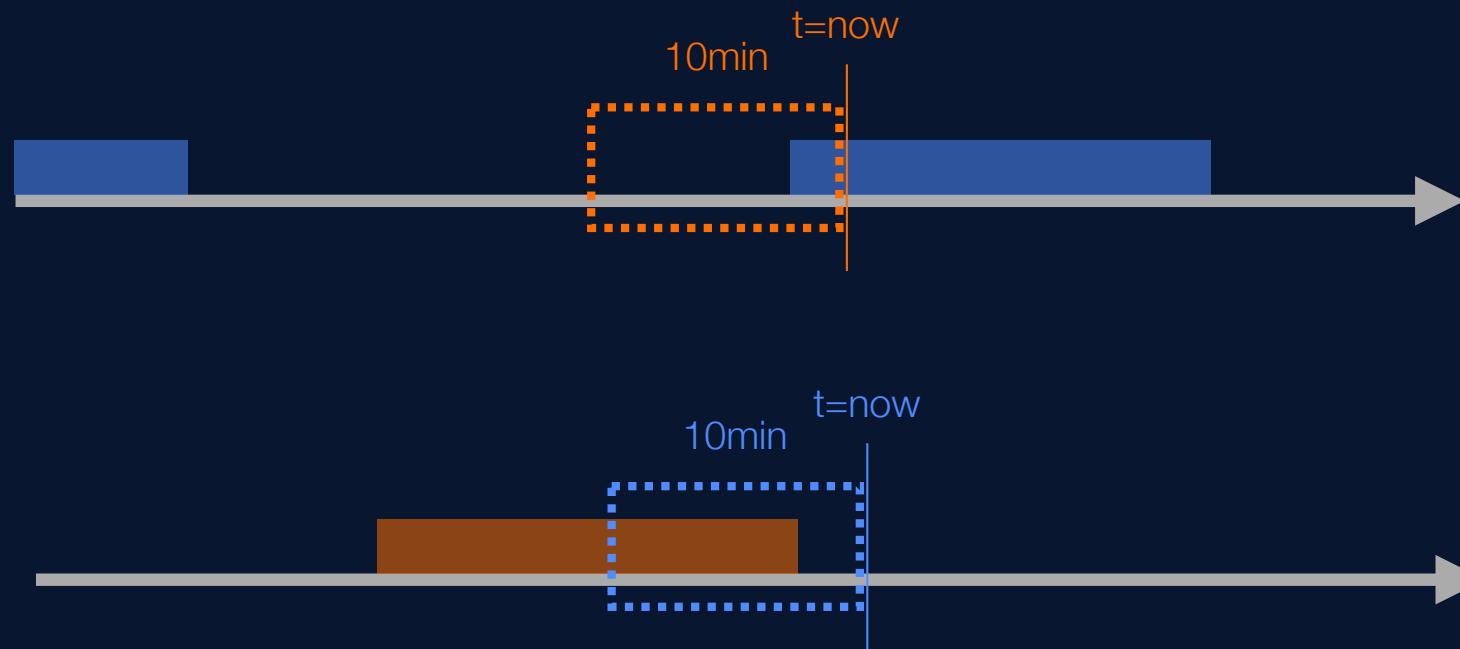
- Prometheus Pushgateway (<https://github.com/prometheus/pushgateway>)
- Metrics Cache
- Publisher frequency vs Prometheus scraping time

Metrics

- 3 main metrics:
 - incoming_operations_last_10_min*
 - incoming_status_last_10_min*
 - migrations_last_5_min
- Gauges (and we were wrong!)

Gauges consequences

- Alerts kept fired unnecessarily



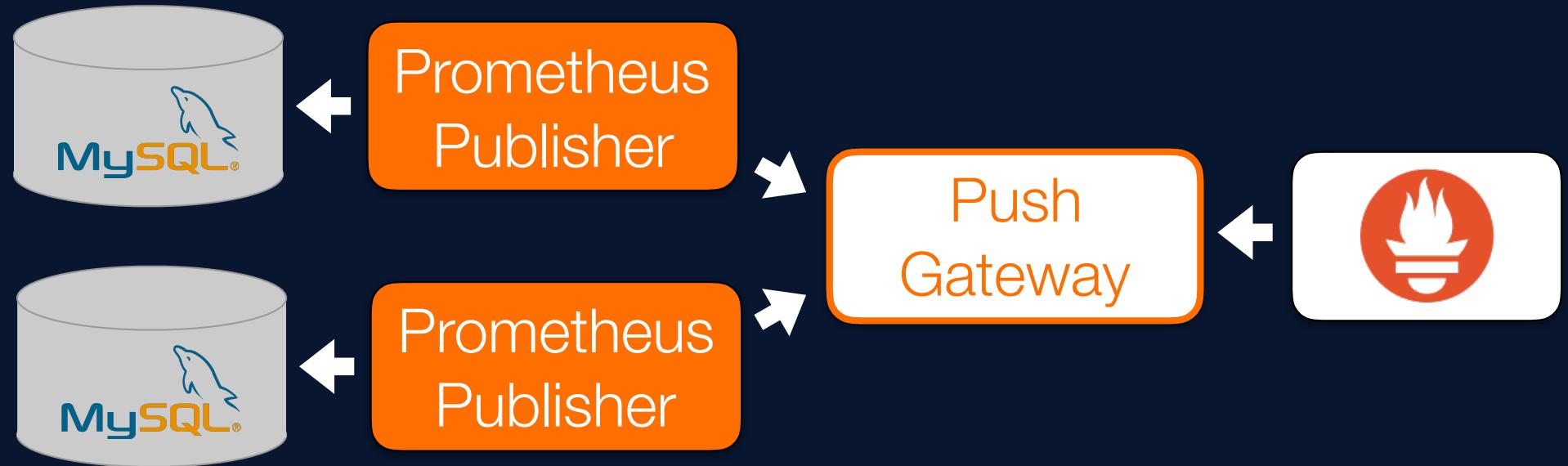
AARRR



THE PIRATE METRICS

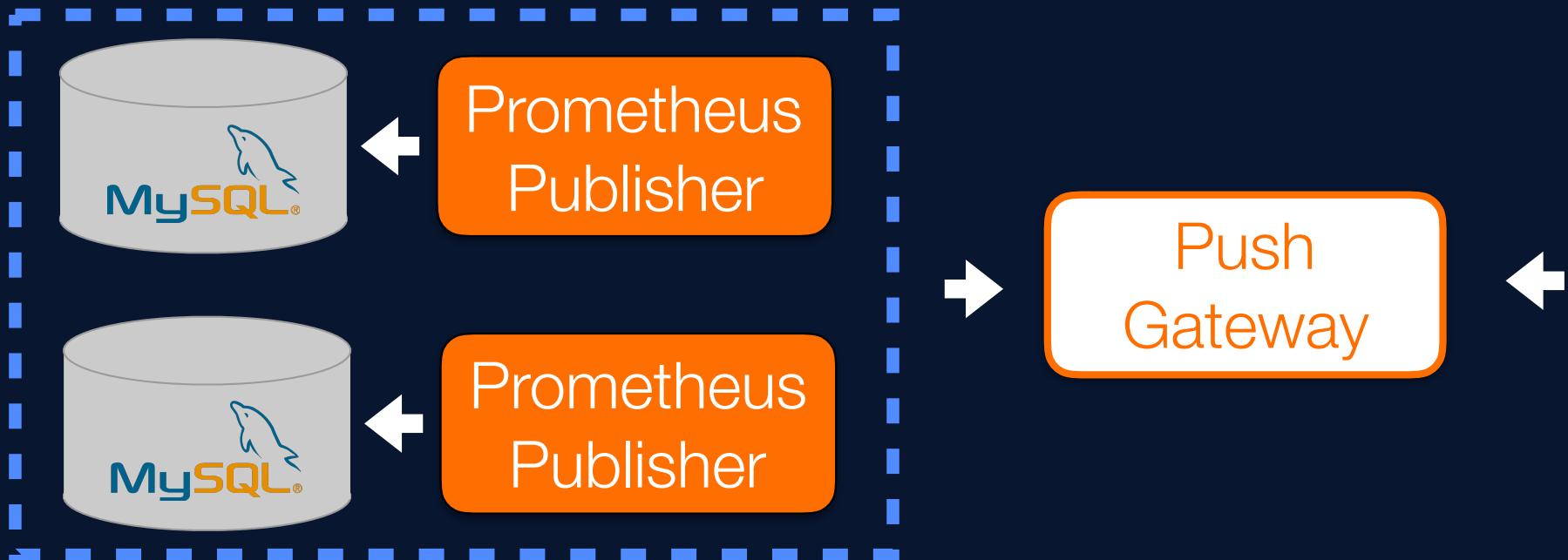
memegenerator.net

HA



- Publisher code is not ready to have two instances of itself
- Publisher operations are not atomic

Clusterize



- Clustering solution because of other services in the same ecosystem

**ONE DOES NOT
SIMPLY**

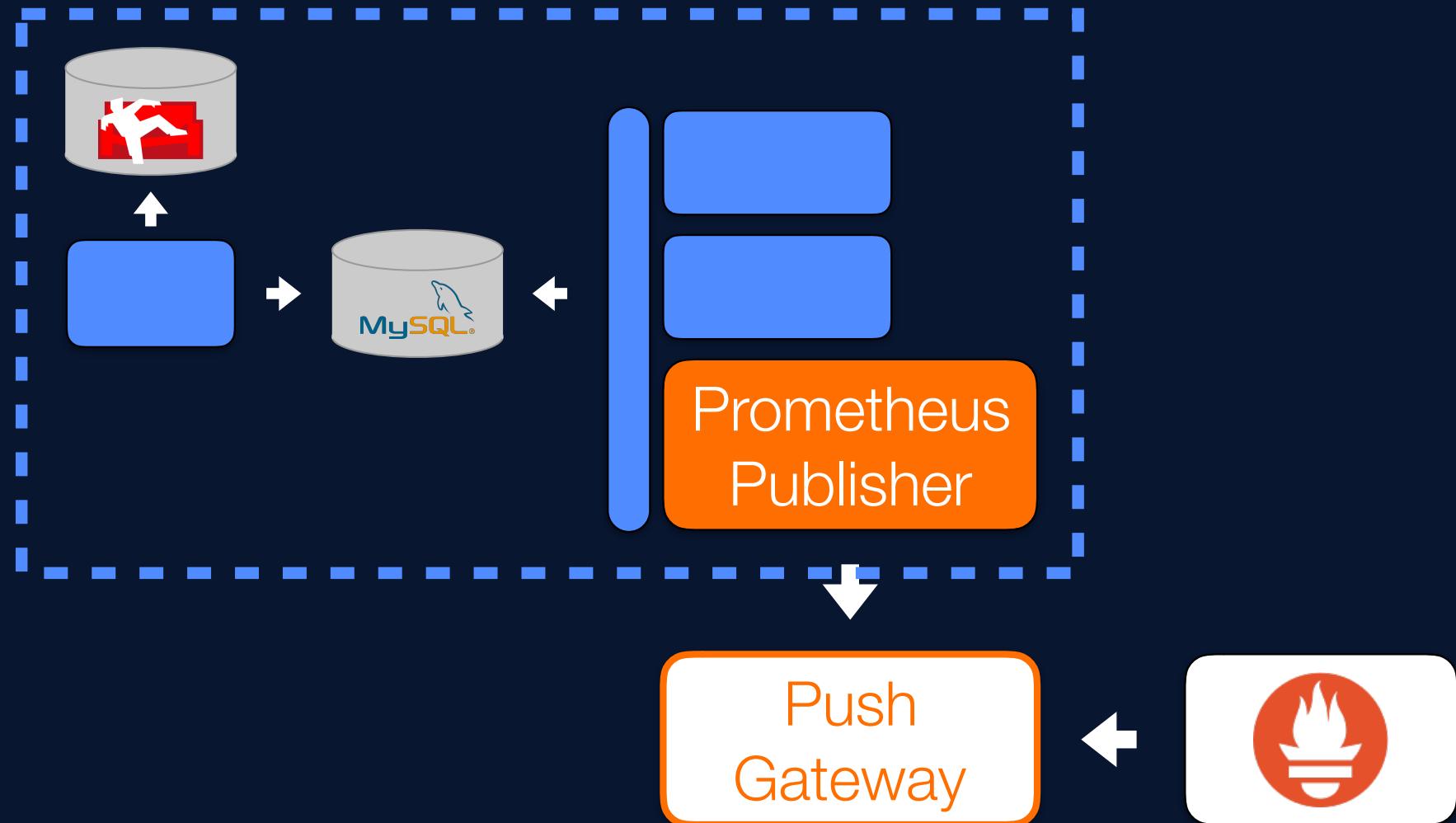
IMPLEMENT HIGH AVAILABILITY

ator.net

Modern History

(Business Metrics: Revamp)

Journey to the Past



New Architecture



From Publisher to Exporter

Operation
Exporter



Prometheus
Publisher

- Standalone App (Dockerized)
- Counters
 - Aggregation in Prometheus
 - Prometheus handles resets
- Stateless
- Cron based script
- Gauges
- Aggregation in Publisher
- Stateful

From Publisher to Exporter



HA



- Operation Exporter is Stateless
- Aggregation in Prometheus:
 - $\max(\dots)$ without(instance)

Metrics

- 3 metrics:
 - operation_requests_total
 - operation_statuses_total
 - operation_errors_total
- Counters \ (^_^\) /

MY PRECIOUS

METRICS

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Alerts

- Predict Linear vs Absolute Threshold

```
# Alert for any instance that has a full filesystem
ALERT DiskFull
  IF 1 - node_filesystem_free / node_filesystem_size >= 0.95
    ...
```



```
ALERT DiskFull
  IF predict_linear(node_filesystem_free{fstype="ext4"}[1d], 3 * 86400) <= 256 * 1024 * 1024
    ...
```

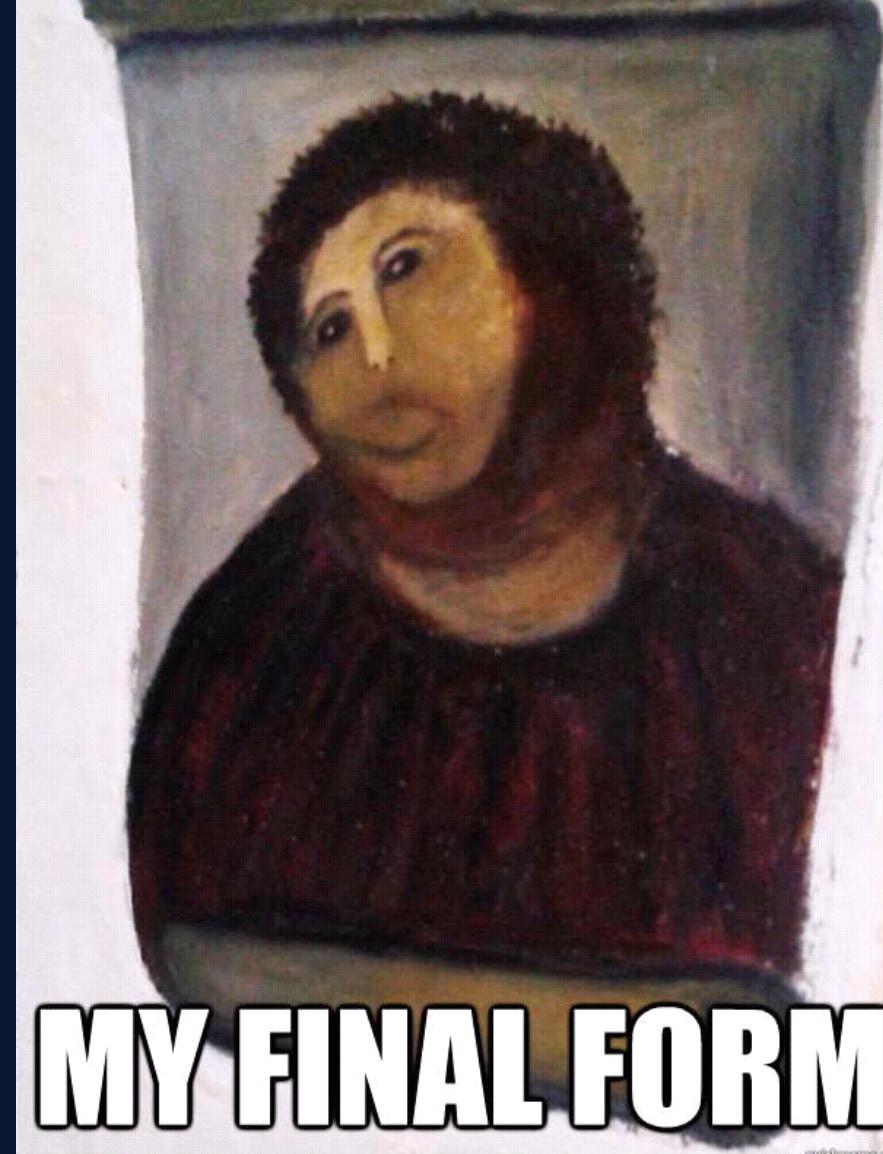
Alert Manager

- 0.0.4 ➔ 0.1.1
- Alerts as a condition-based tree vs condition-based list
- Similar alerts are grouped when notified
- Pagerduty integration improved

Current Architecture?



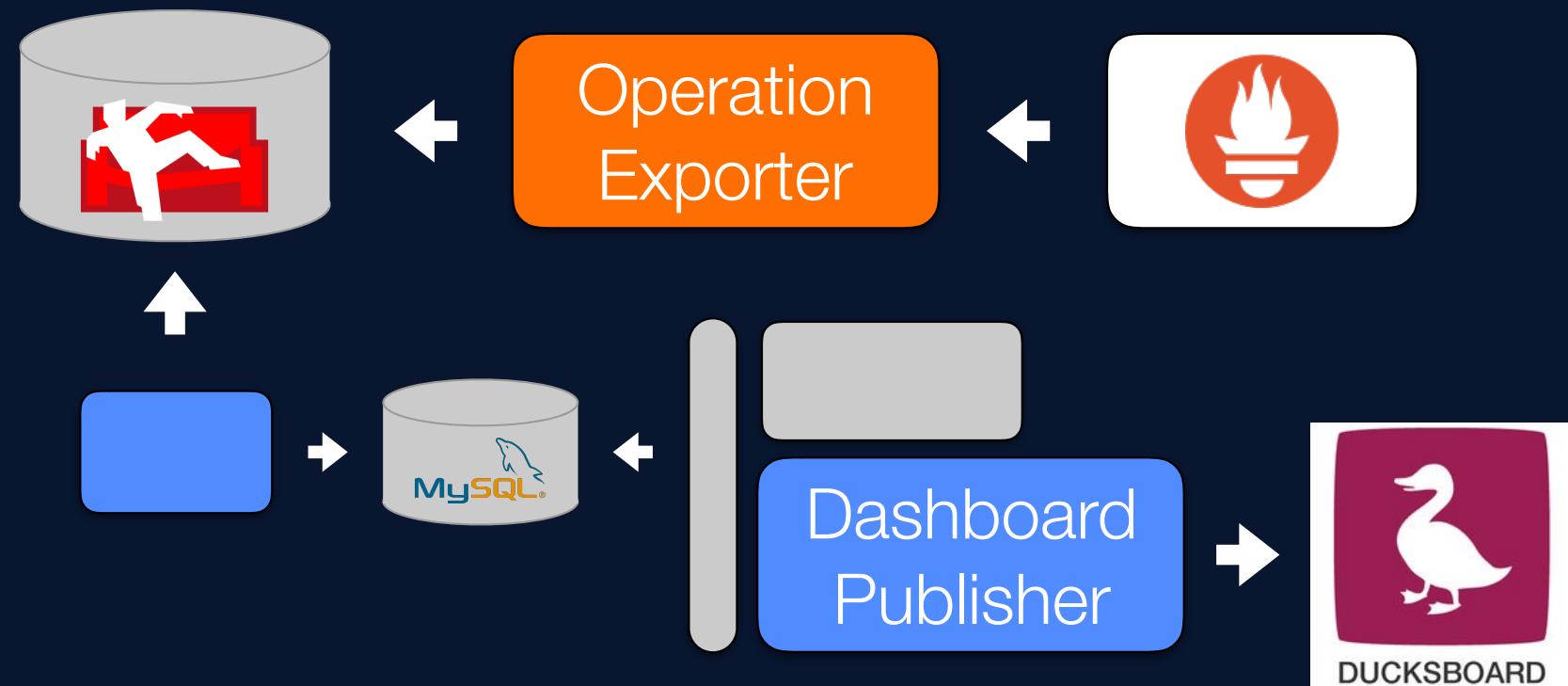
THIS ISN'T EVEN



MY FINAL FORM

Dashboard

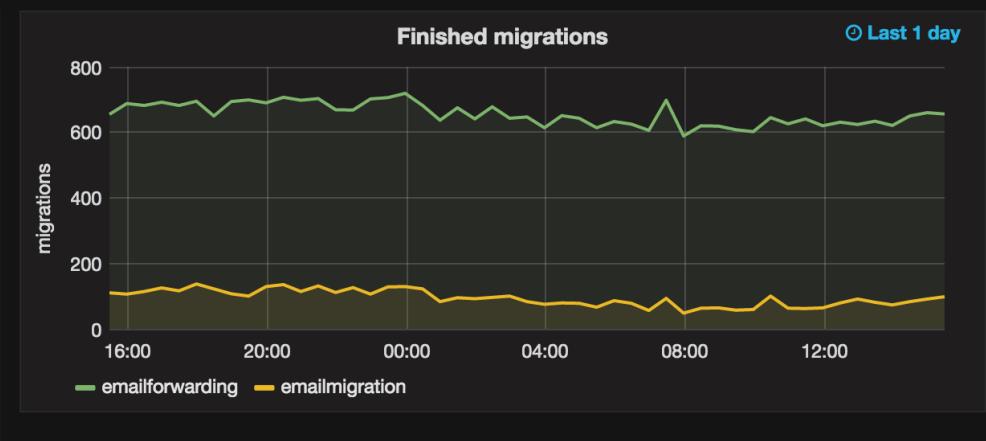
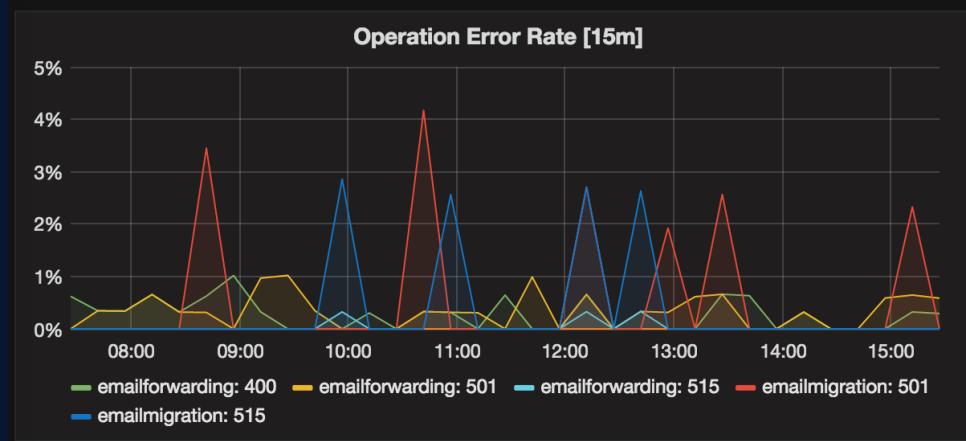
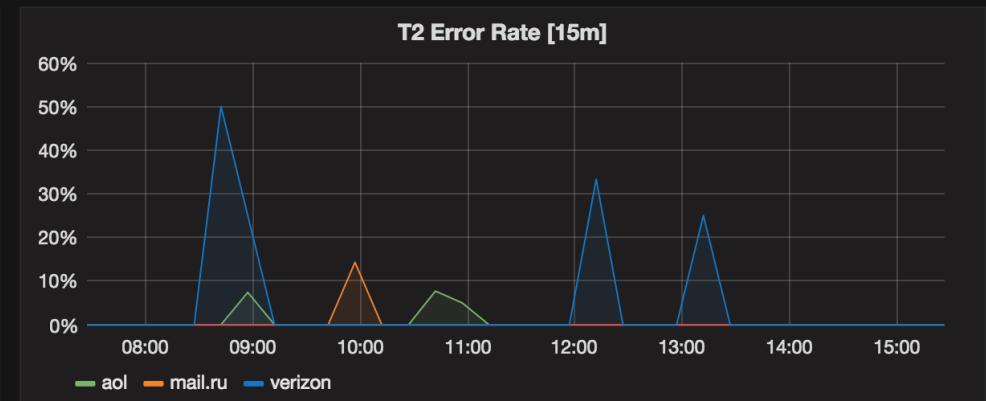
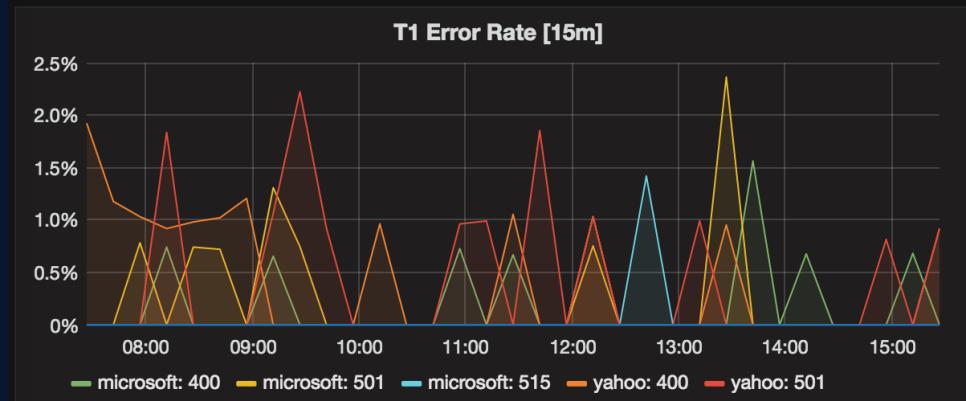
Status DB



Grafana



Our new fancy Dashboard



Anything missing?



Blackbox Exporter

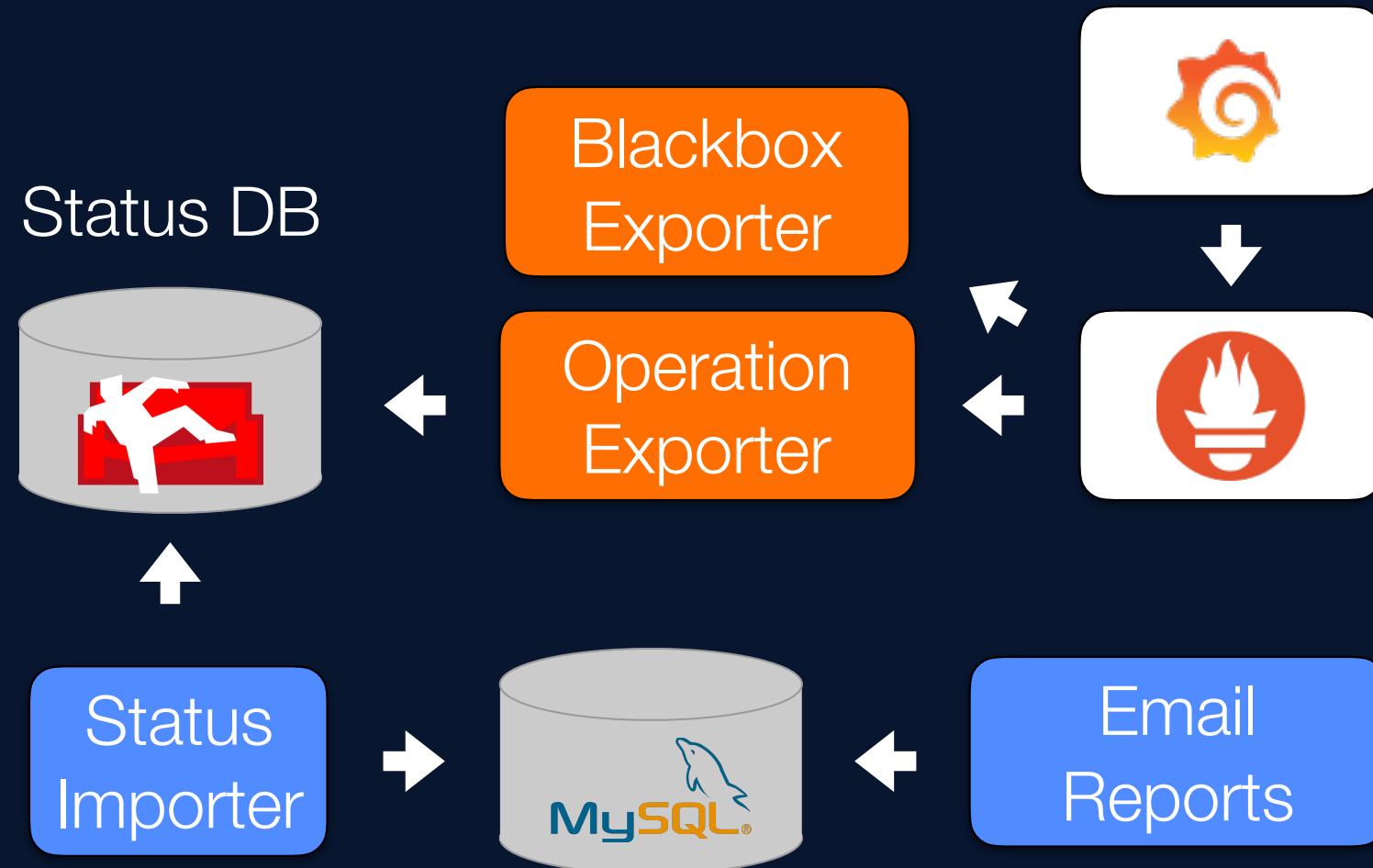
- Metrics on certificates expiring date
- Kudos to:



Robust Perception

<http://www.robustperception.io/get-alerted-before-your-ssl-certificates-expire/>

Finally





YES WE CAN

SORT OF

Troll.me



LOOK AT ALL THESE THINGS

I STILL CAN'T AFFORD!

Approximate usage

- Monitor 200 instances with:
- 1 Prometheus instance in GCE (n1-standard-2)
- 1 HD (used ~30GB with default retention period 15d)
- 1 Meta-monitoring instance (f1 -micro)

Back to the future

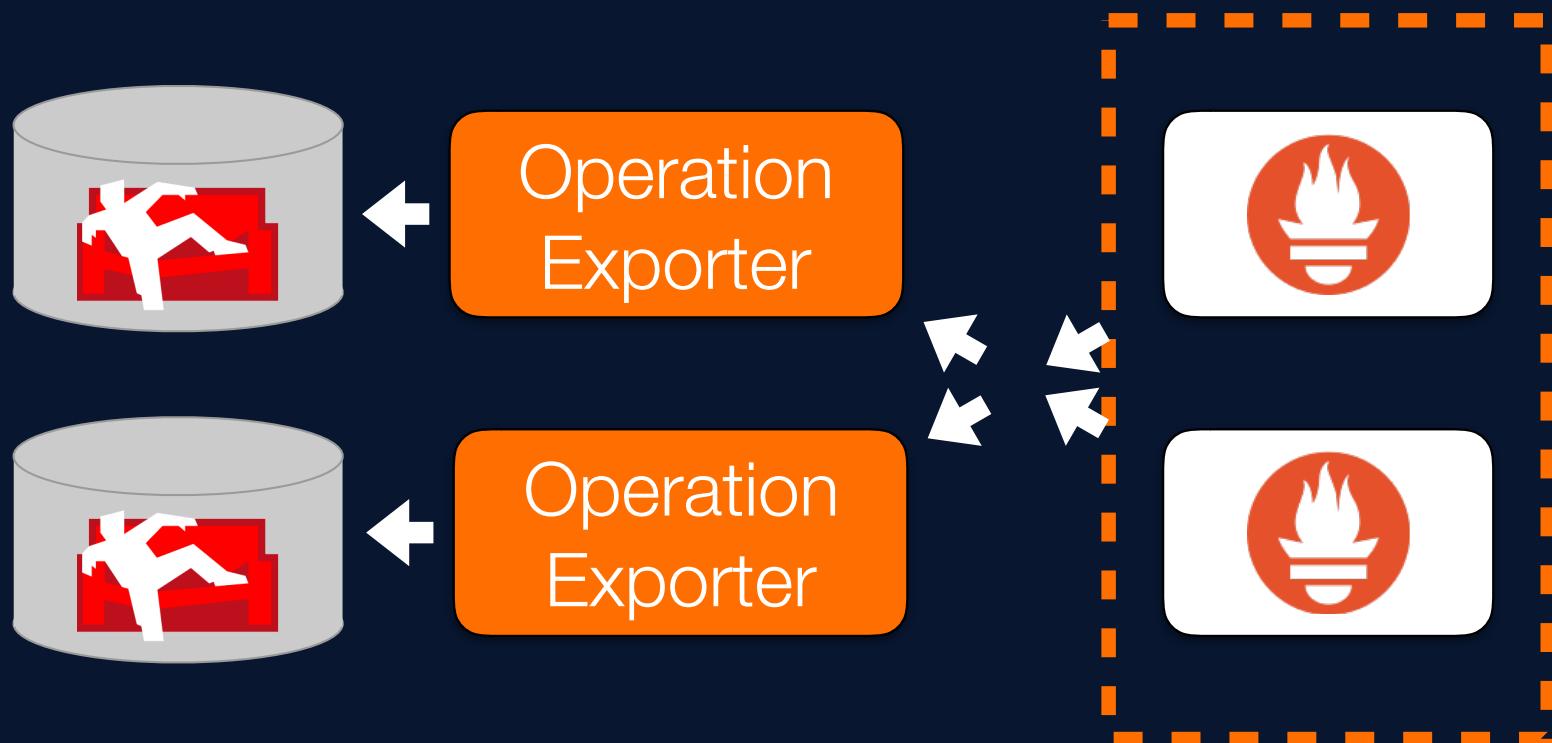
(Next Steps)

CouchDB Exporter

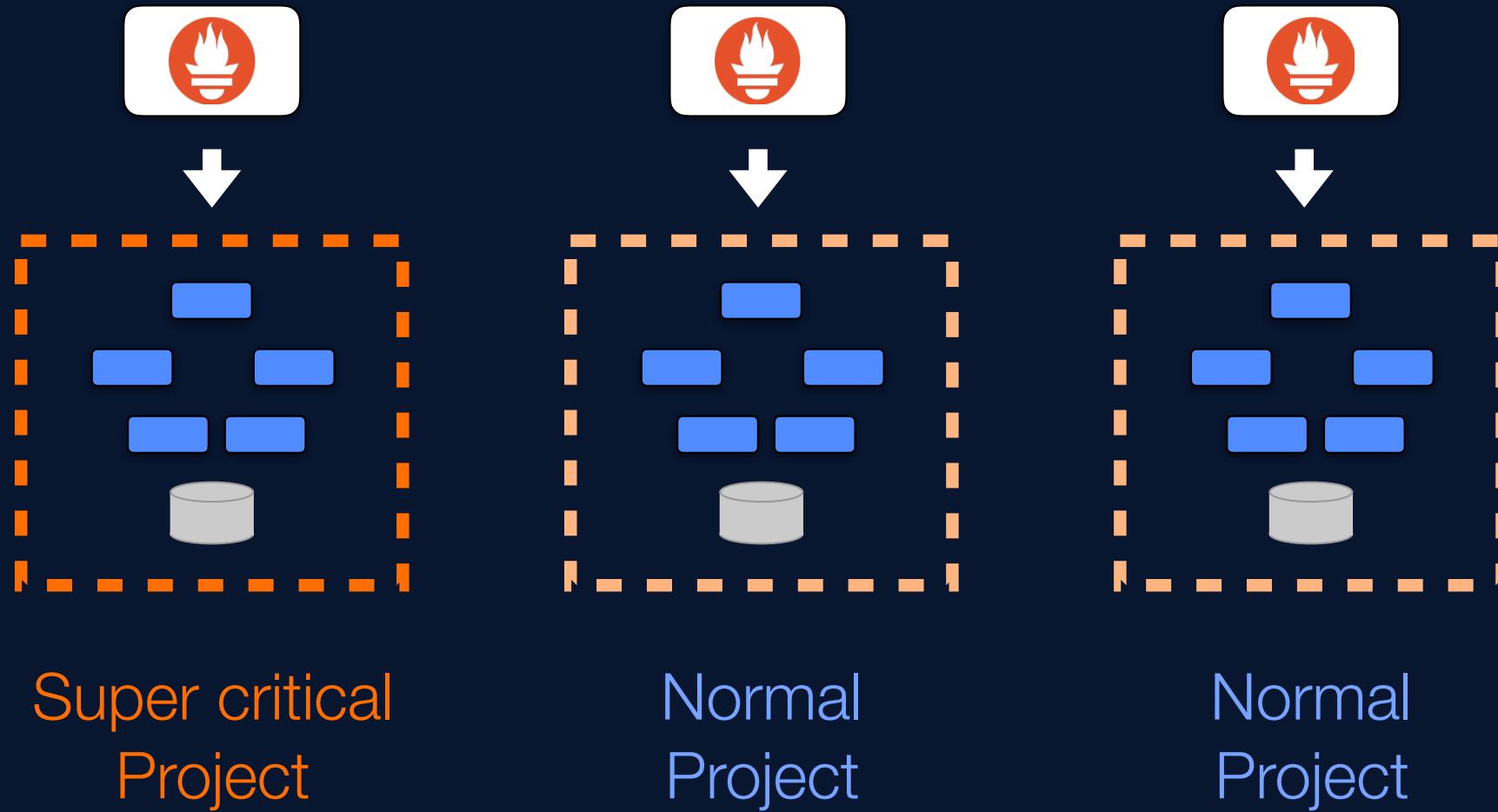
- Currently exporting metrics with textfile via node_exporter

```
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couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
couchdb_replication_active{id=""} 1
```

Prometheus in HA



Simplify current Alert System



Instrumenting Code

- Currently:
 - Operation Metrics
 - Business Metrics (~Blackbox Monitoring)
- Missing Metrics from Services

GOOD GOOD...

**LET THE METRICS FLOW THROUGH
YOU.**

quickmeme.com



THANK YOU!

@ShuttleCloud

@ShuttleCloudEng

