INDEX
SAN FRANCISCO

Discover. Collaborate. Deploy.

Fixing Under Fire

Aiton S Goldman

Michael Lipschultz

Fixing Under Fire

The first shift….OF TERROR!

UNSPEAKABLE HORRORS FROM OUTER SPACE PARALYZE THE LIVING AND RESURRECT THE DEAD!
PLAN 9 FROM OUTER SPACE
with
BELA LUGOSI
VAMPIRA
LYLE TALBOT
A J. Edward Reynolds Production
Produced and Directed by Edward D. Wood, Jr.
DCA

The problem

Questions we should have asked

“What is the on call person’s duties?”

- The on-call person needs to be allowed time to do more than just fix the current fire
  - Needs to update playbooks
  - Needs to update logging/metrics
  - Needs to fix root causes

“How bad are things?”

- The on-call person needs a way to communicate to the rest of the group what is happening

“How bad are things?”

THE END

IT PAGED AT 5 PM!

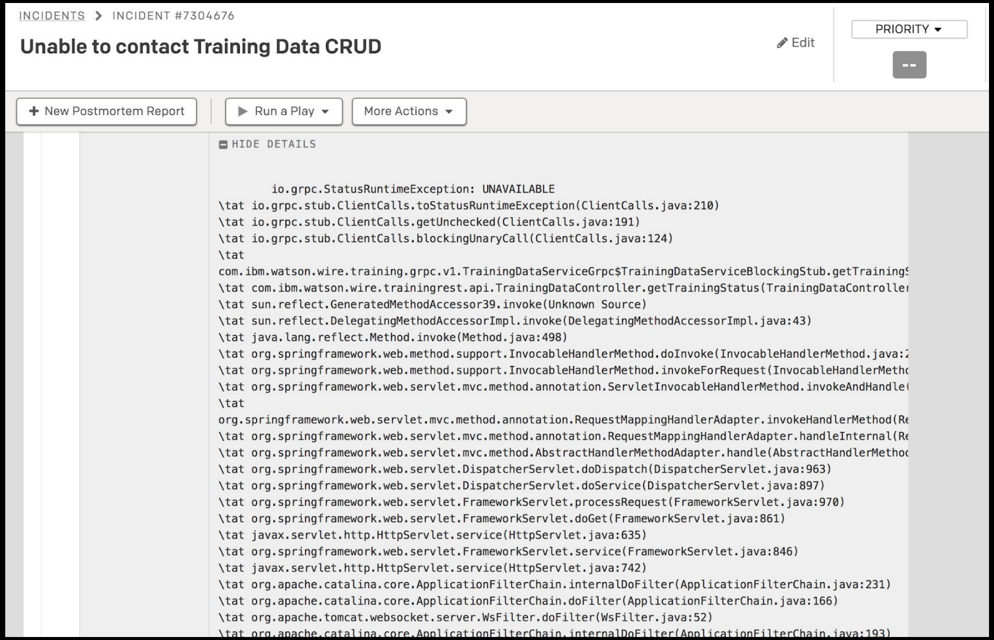
THIS ISLAND, EARTH
TWO MORTALS TRAPPED IN OUTER SPACE... CHALLENGING THE UNEARTHLY FURIES OF AN OUTLAW PLANET GONE MAD!
2½ YEARS IN THE MAKING! ...to bring you sights of FANTASTIC AMAZEMENT never before possible on the motion picture screen!
IN COLOR BY TECHNICOLOR
THIS ISLAND EARTH
starring
JEFF MORROW · FAITH DOMERGUE · REX REASON with LANCE FULLER · RUSSELL JOHNSON
DIRECTED BY JOSEPH NEWMAN · SCREENPLAY BY FRANKLIN COEN AND EDWARD G. O'CALLAGHAN · PRODUCED BY WILLIAM ALLAND · A UNIVERSAL INTERNATIONAL PICTURE

The problem

Questions we should have asked

“How do we tell upstream services something has gone wrong?”

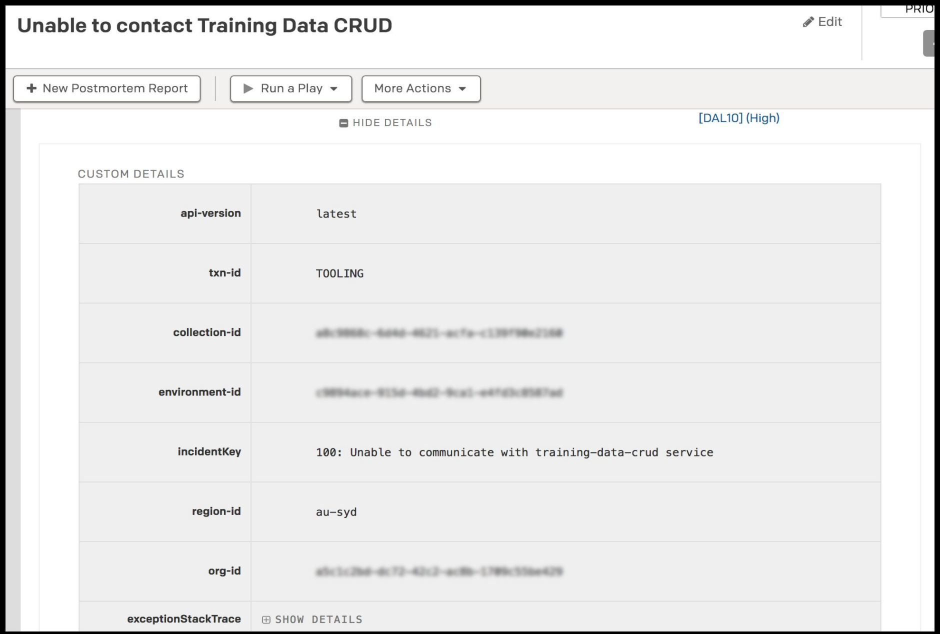
- Who reported the error?



Unable to contact Training Data CRUD

```
        io.grpc.StatusRuntimeException: UNAVAILABLE
\tat io.grpc.stub.ClientCalls.toStatusRuntimeException(ClientCalls.java:210)
\tat io.grpc.stub.ClientCalls.getUnchecked(ClientCalls.java:191)
\tat io.grpc.stub.ClientCalls.blockingUnaryCall(ClientCalls.java:124)
\tat
com.ibm.watson.wire.training.grpc.v1.TrainingDataServiceGrpc$TrainingDataServiceBlockingStub.getTraining
\tat com.ibm.watson.wire.trainingrest.api.TrainingDataController.getTrainingStatus(TrainingDataControlle
\tat sun.reflect.GeneratedMethodAccessor39.invoke(Unknown Source)
\tat sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
\tat java.lang.reflect.Method.invoke(Method.java:498)
\tat org.springframework.web.method.support.InvocableHandlerMethod.doInvoke(InvocableHandlerMethod.java:
\tat org.springframework.web.method.support.InvocableHandlerMethod.invokeForRequest(InvocableHandlerMeth
\tat org.springframework.web.servlet.mvc.method.annotation.ServletInvocableHandlerMethod.invokeAndHandle
\tat
org.springframework.web.servlet.mvc.method.annotation.RequestMappingHandlerAdapter.invokeHandlerMethod(R
\tat org.springframework.web.servlet.mvc.method.annotation.RequestMappingHandlerAdapter.handleInternal(R
\tat org.springframework.web.servlet.mvc.method.AbstractHandlerMethodAdapter.handle(AbstractHandlerMetho
\tat org.springframework.web.servlet.DispatcherServlet.doDispatch(DispatcherServlet.java:963)
\tat org.springframework.web.servlet.DispatcherServlet.doService(DispatcherServlet.java:897)
\tat org.springframework.web.servlet.FrameworkServlet.processRequest(FrameworkServlet.java:970)
\tat org.springframework.web.servlet.FrameworkServlet.doGet(FrameworkServlet.java:861)
\tat javax.servlet.http.HttpServlet.service(HttpServlet.java:635)
\tat org.springframework.web.servlet.FrameworkServlet.service(FrameworkServlet.java:846)
\tat javax.servlet.http.HttpServlet.service(HttpServlet.java:742)
\tat org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:231)
\tat org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:166)
\tat org.apache.tomcat.websocket.server.WsFilter.doFilter(WsFilter.java:52)
\tat org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:193)
```

BAD



Unable to contact Training Data CRUD

CUSTOM DETAILS

api-version	latest
txn-id	TOOLING
collection-id	[redacted]
environment-id	[redacted]
incidentKey	100: Unable to communicate with training-data-crud service
region-id	au-syd
org-id	[redacted]
exceptionStackTrace	⊞ SHOW DETAILS

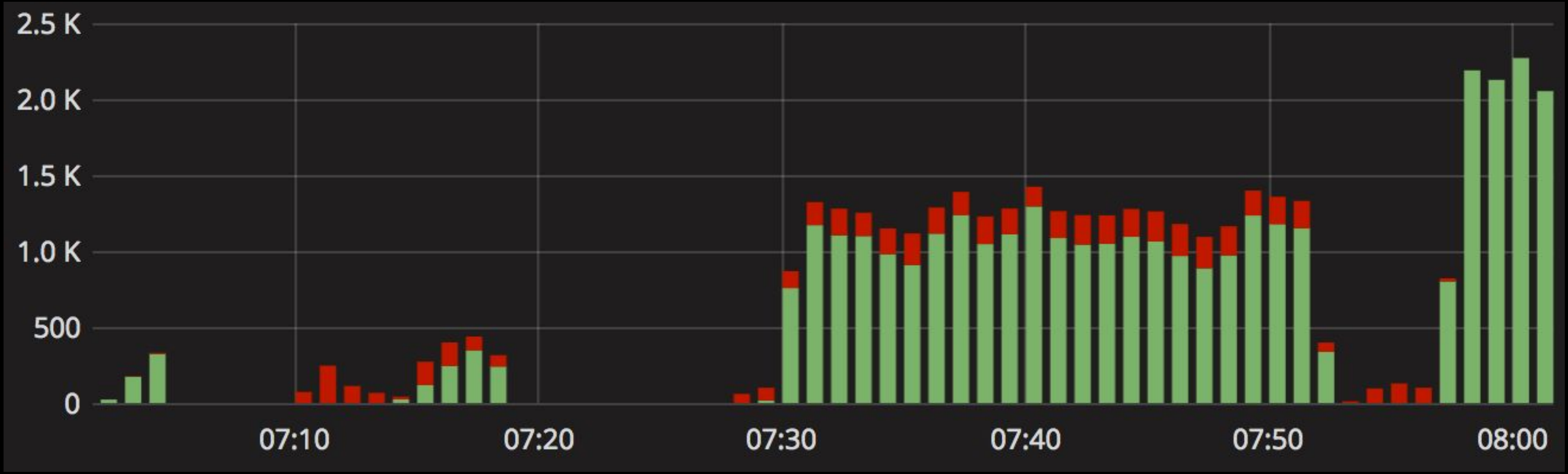
GOOD

“How do I know what to focus on when there is trouble?”

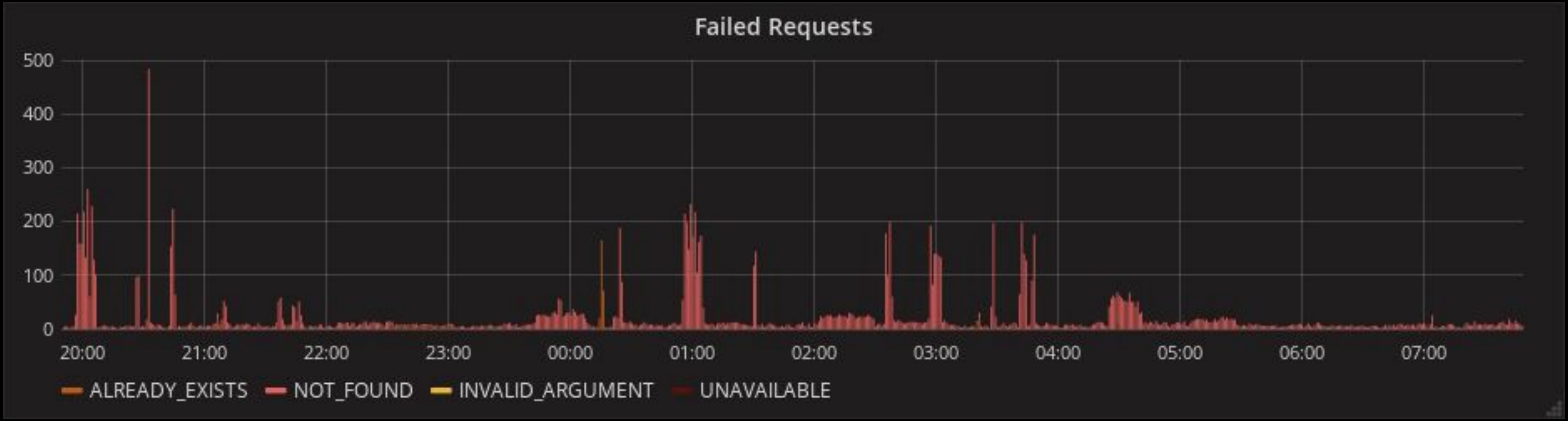
- Is this problem impacting the customer?
- Can I tell if the problem is intermittent?
- Is my service healthy?

“How do I know what to focus on when there is trouble?”

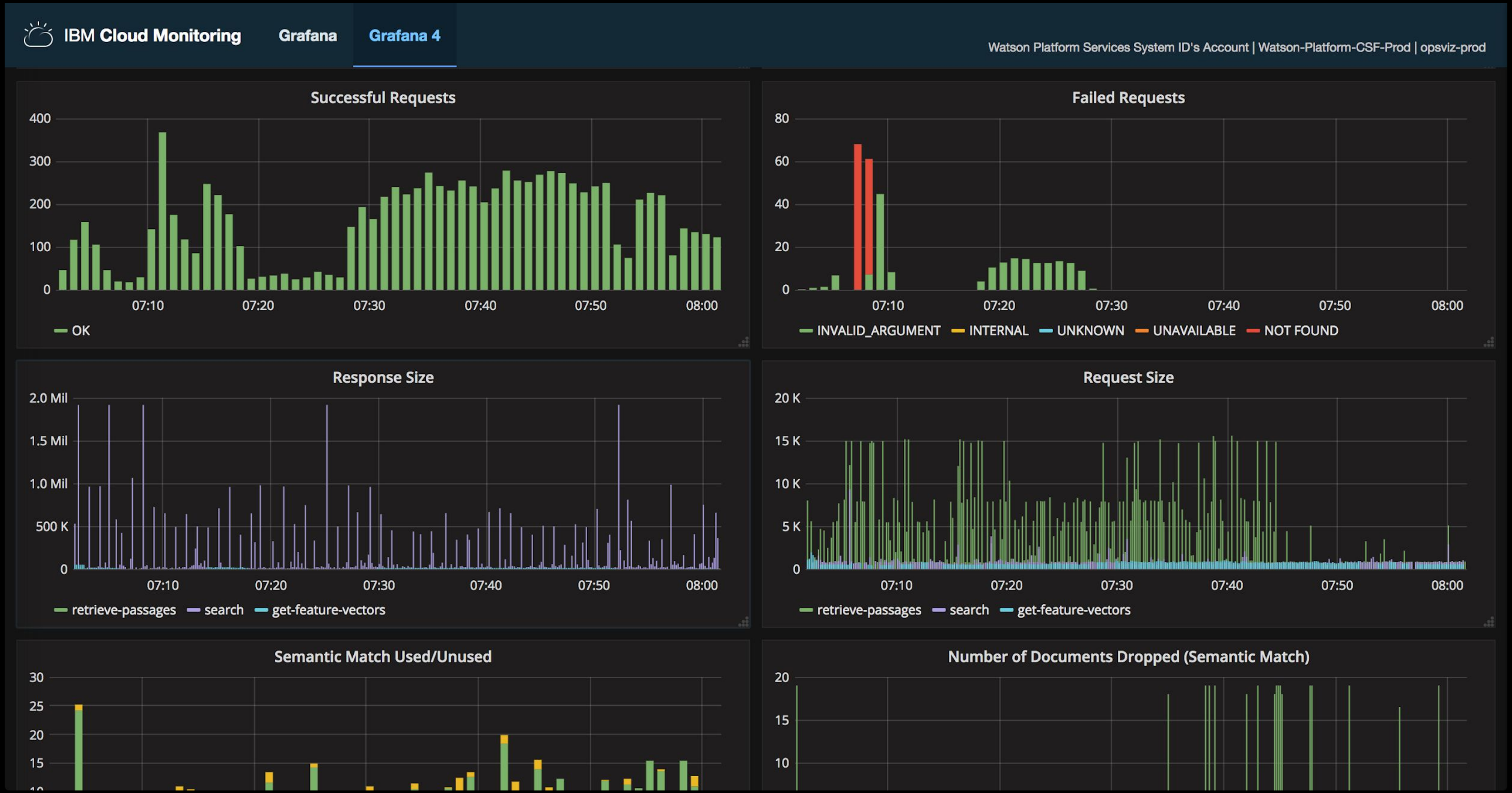
Is my service healthy?



“How do I know what to focus on when there is trouble?”



“How do I know what to focus on when there is trouble?”



IT CAME FROM THE USER!

It was a week like any other ...

… at first

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

Alert

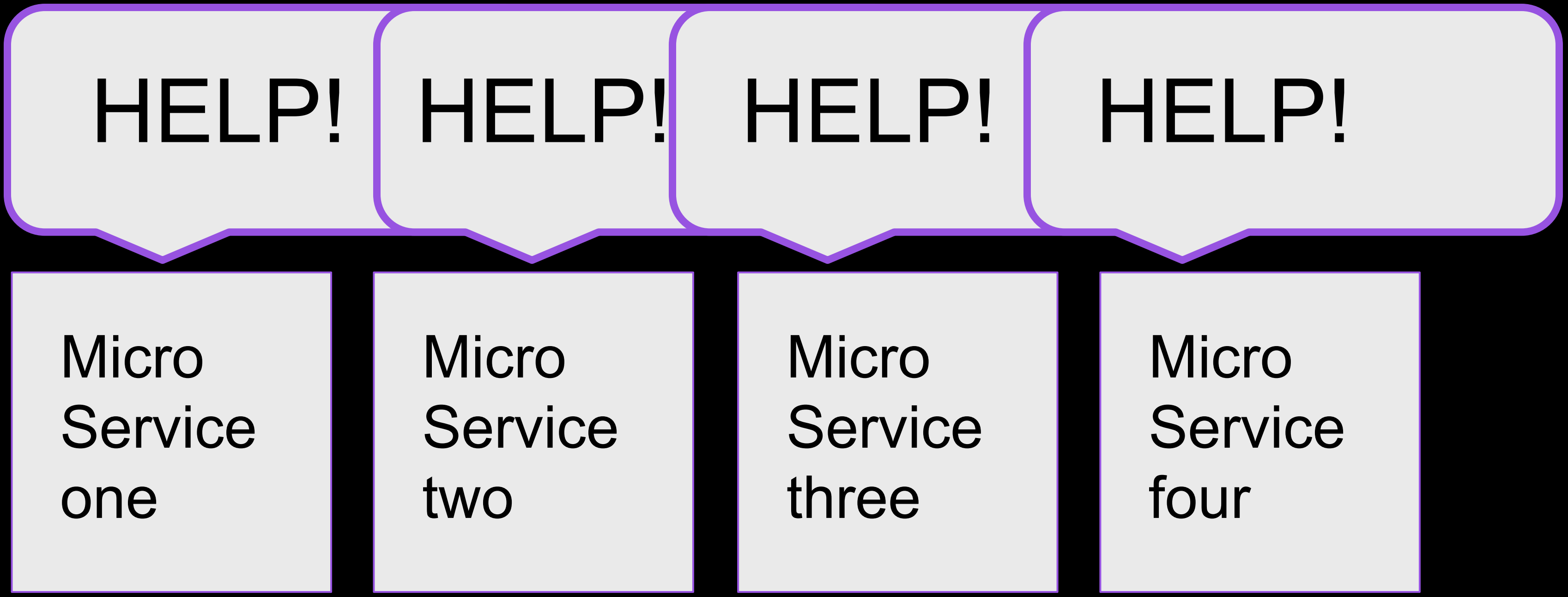
Alert

Alert

Questions we should have asked

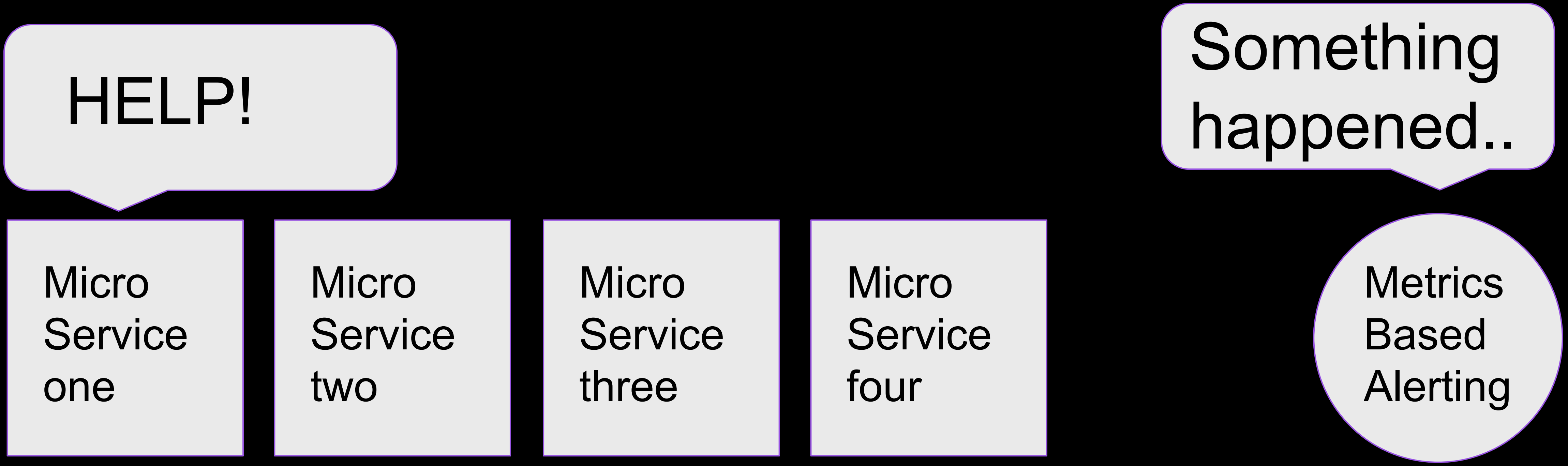
“How do we avoid flooding the on call person with information?”

- Avoid double reporting



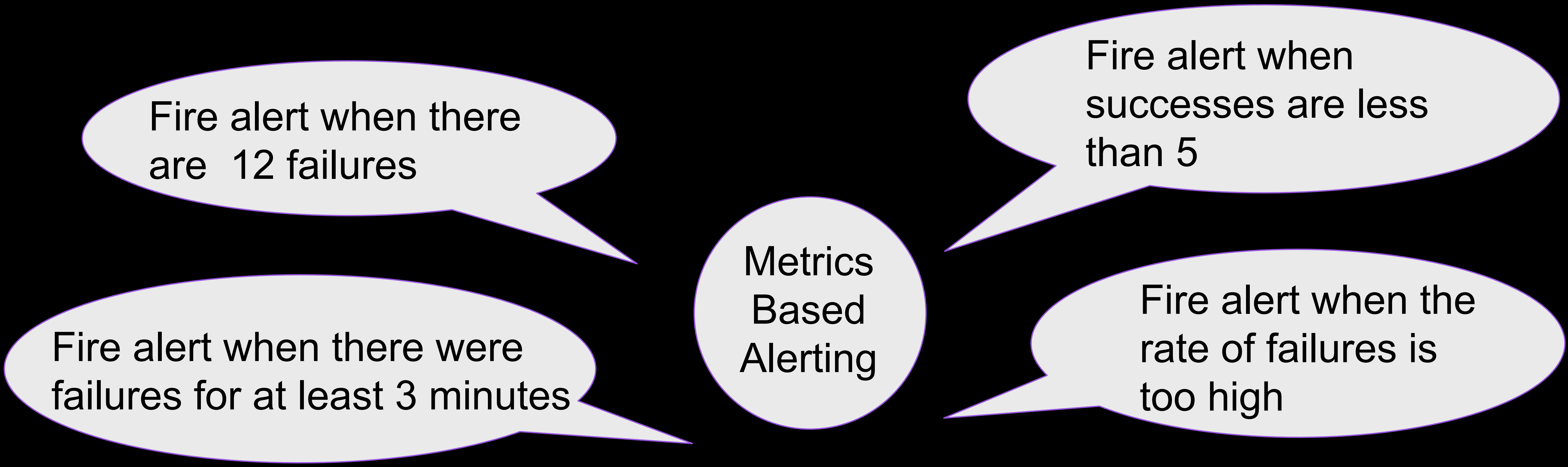
“How do we avoid flooding the on call person with information?”

- Avoid double reporting?



“How do we avoid flooding the on call person with information?”

- Making things that wake us up configurable



Fire alert when there are 12 failures

Fire alert when successes are less than 5

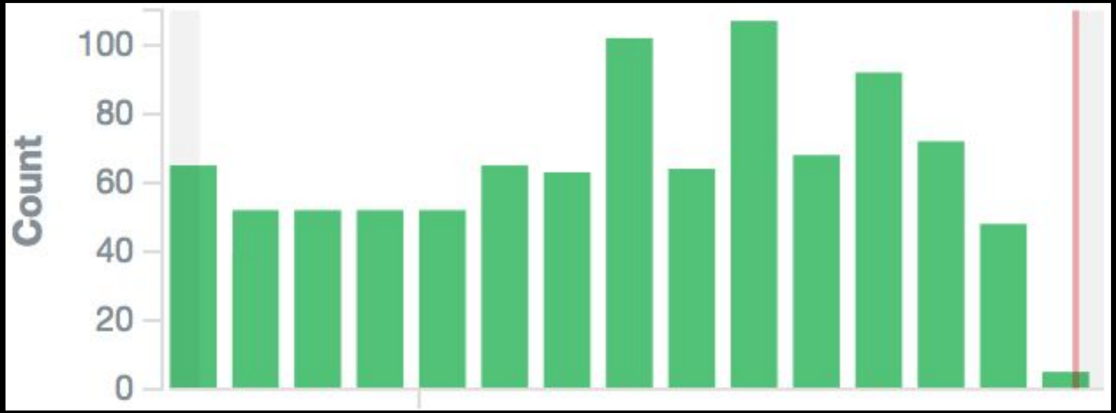
Metrics Based Alerting

Fire alert when there were failures for at least 3 minutes

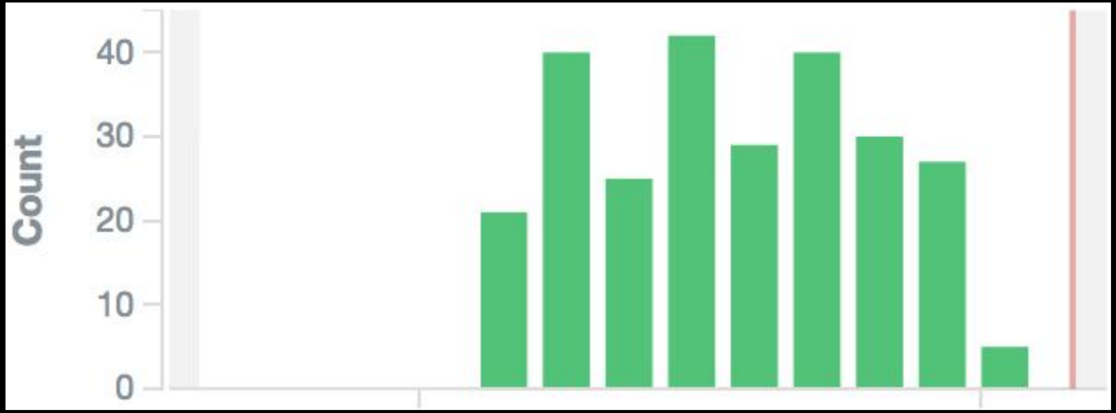
Fire alert when the rate of failures is too high

“Can I tell if it’s a specific customer/group of customers causing the problem?”

All logs:



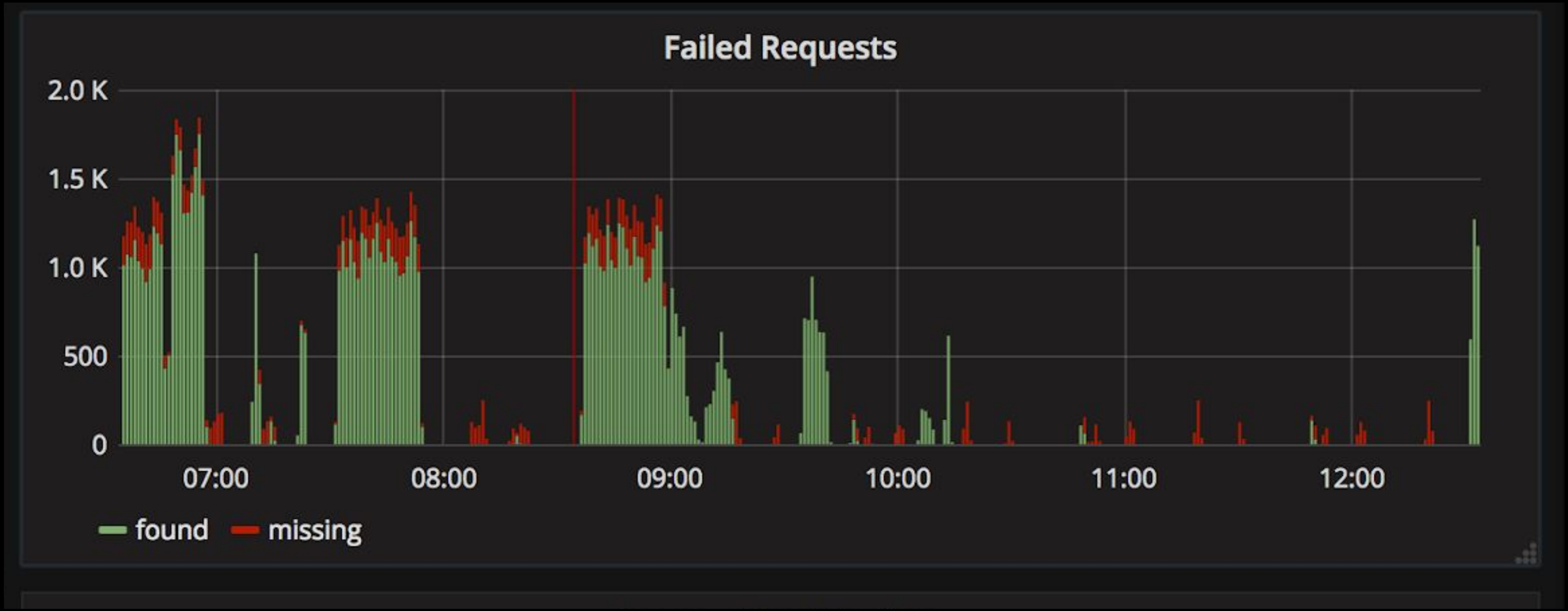
Logs for specific customer:



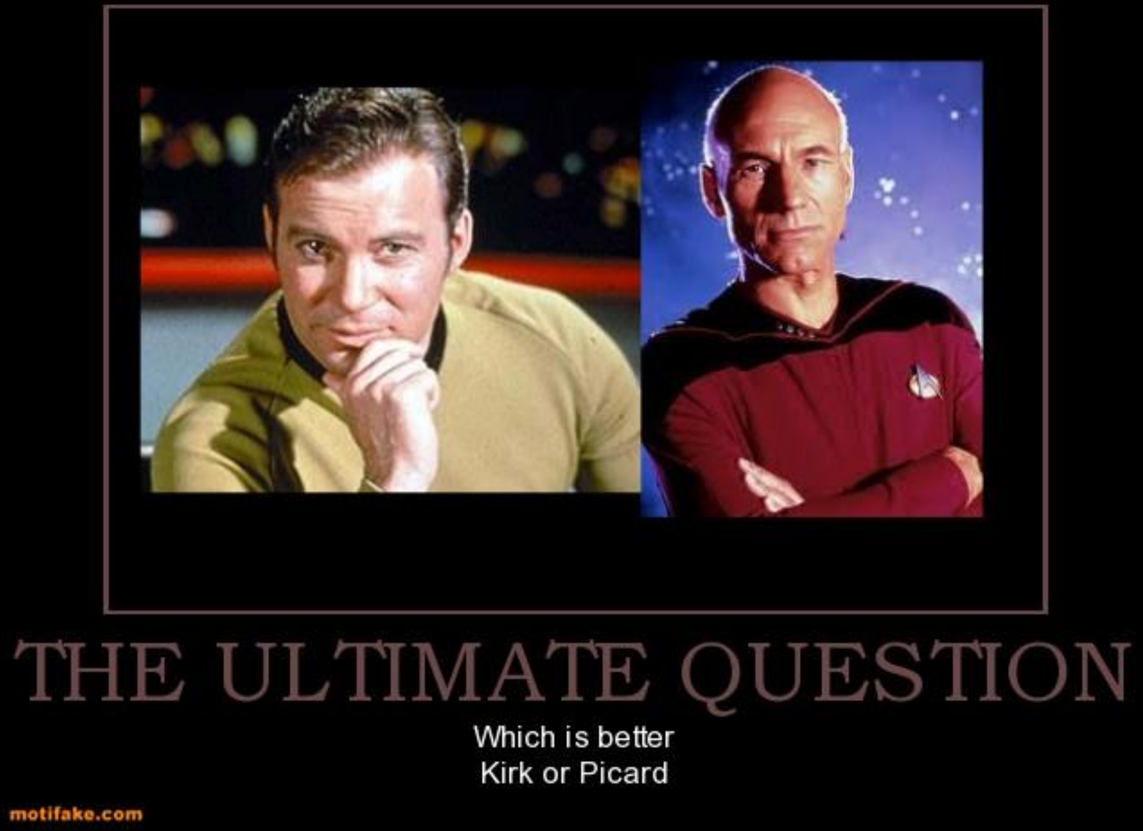
From beyond the proxy!

AMAZING THRILLS!
IN 3-DIMENSION
Fantastic sights leap at you!
IT CAME FROM OUTER SPACE
Starring RICHARD CARLSON · BARBARA RUSH
with CHARLES DRAKE · RUSSELL JOHNSON · KATHLEEN HUGHES · JOE SAWYER · Directed by JACK ARNOLD · Screenplay by HARRY ESSEX · Produced by WILLIAM ALLAND · A UNIVERSAL-INTERNATIONAL PICTURE

The problem

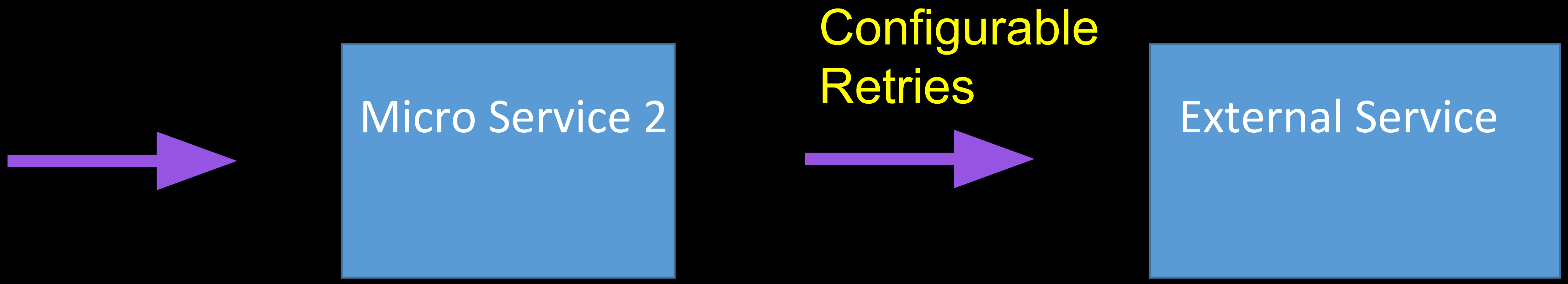

Failed Requests
2.0 K
1.5 K
1.0 K
500
0
07:00
08:00
09:00
10:00
11:00
12:00
🟩 found
🟥 missing

Questions we should have asked



“Can we trust the external service?“

- What we should have done...



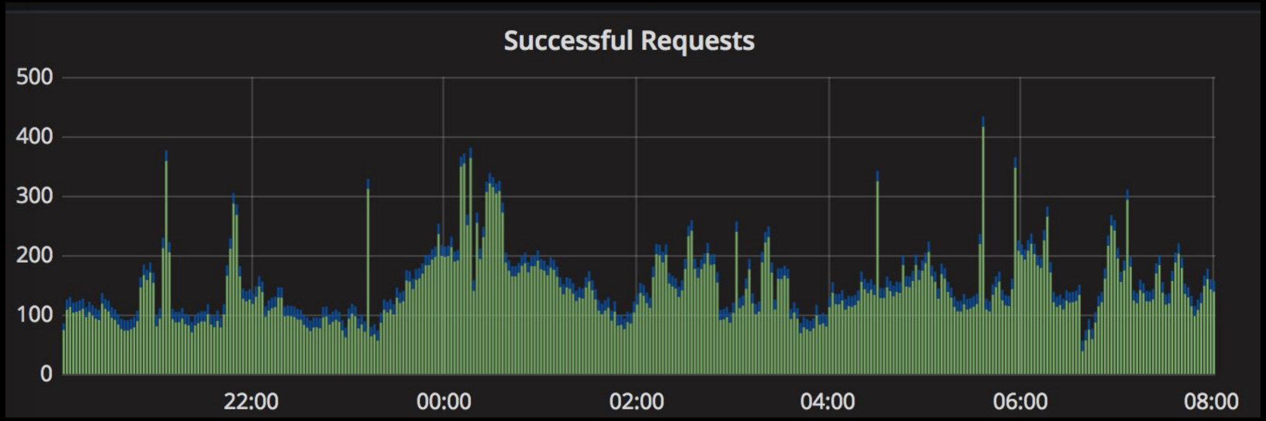
“Can I reproduce a request to the external service?”

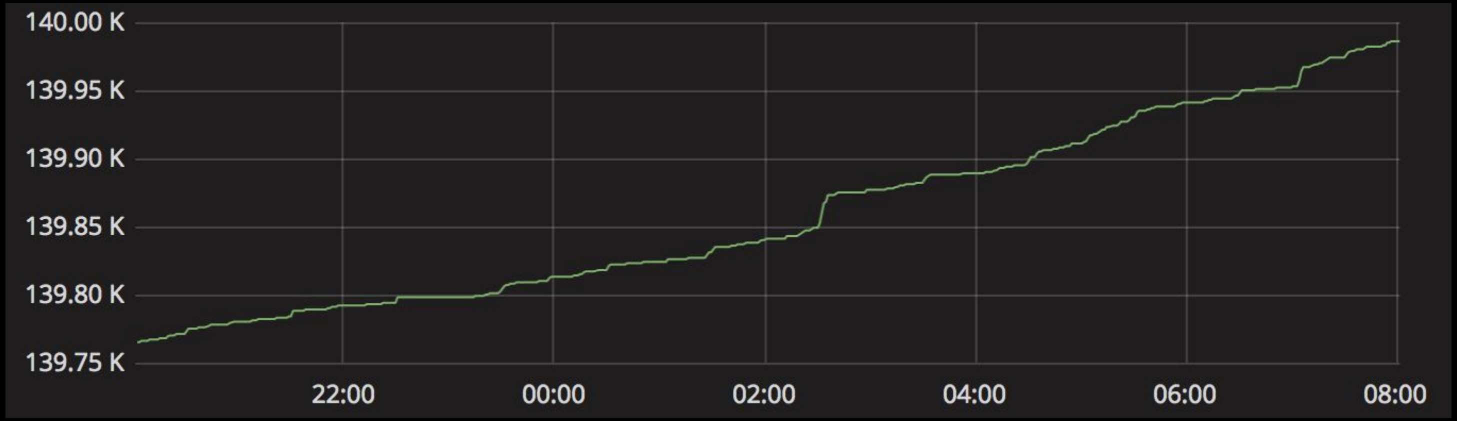
- We needed to put as much info (or meta info) as possible into logging with regards to connecting with external services

- We needed to track a request all the way through the stack

Who you gonna call?

“Ray, this looks extraordinarily bad”





Questions we should have asked...

“Who do we depend on?”

- Watson has over 2000 IBM employees
- That doesn’t include all the teams outside Watson we depend on
- How do we reach the ones we depend on at 2am?

“Who do we depend on?”

Revisiting “It Paged at 5PM!”

- What information would they need to help?

“Who depends on us?”

- How do groups that depend on us communicate with us?
- How do we communicate with them?

A quick fix...OF DOOM!

Reboot it

Even if your service is stateless..

- Connection limitations (i.e. to databases)
- Quotas

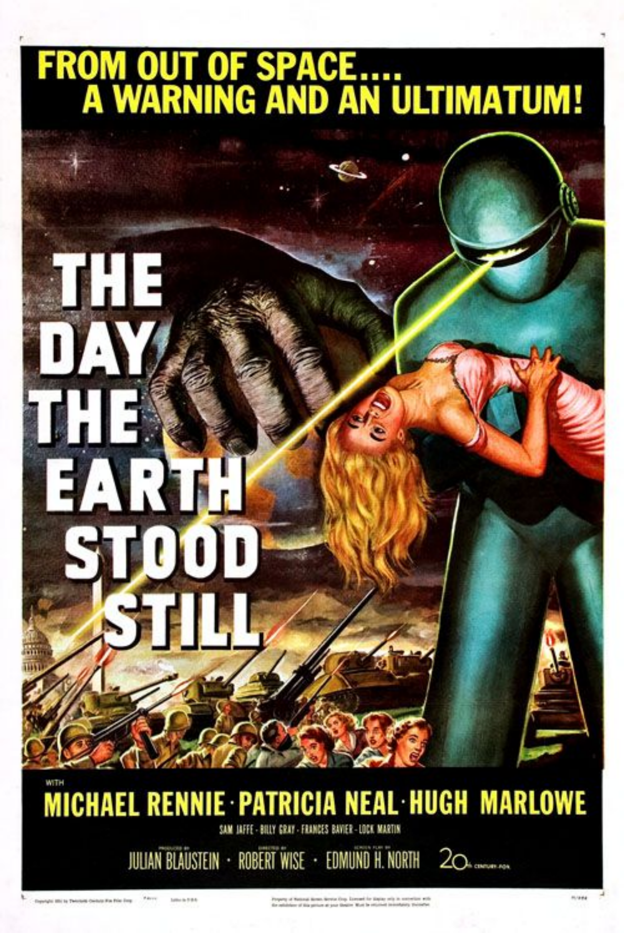
Rollback

- Do I know what versions to roll back to?
- Do I need to consider DB schema?

Cleanup the database

- Vacuum the database
- Free up connections

What did we learn today?


FROM OUT OF SPACE....
A WARNING AND AN ULTIMATUM!
THE DAY THE EARTH STOOD STILL
WITH
MICHAEL RENNIE · PATRICIA NEAL · HUGH MARLOWE
SAM JAFFE · BILLY GRAY · FRANCES BAVIER · LOCK MARTIN
PRODUCED BY
JULIAN BLAUSTEIN
DIRECTED BY
ROBERT WISE
SCREEN PLAY BY
EDMUND H. NORTH
20th CENTURY-FOX

Lessons Learned

“Communicating internally and externally”

Sharing pager duty reports with the whole team

“How bad are we doing?”

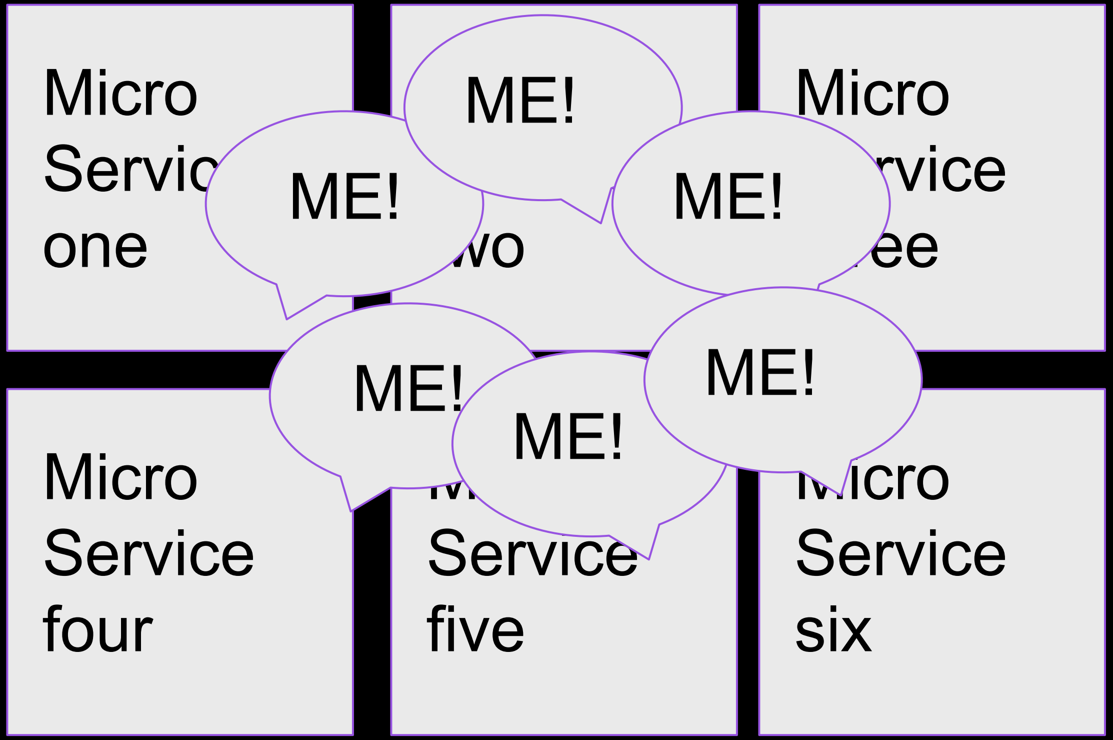
Lessons Learned

“Communicating internally and externally”

Do we know how to contact other groups?
Do they know how to contact us?

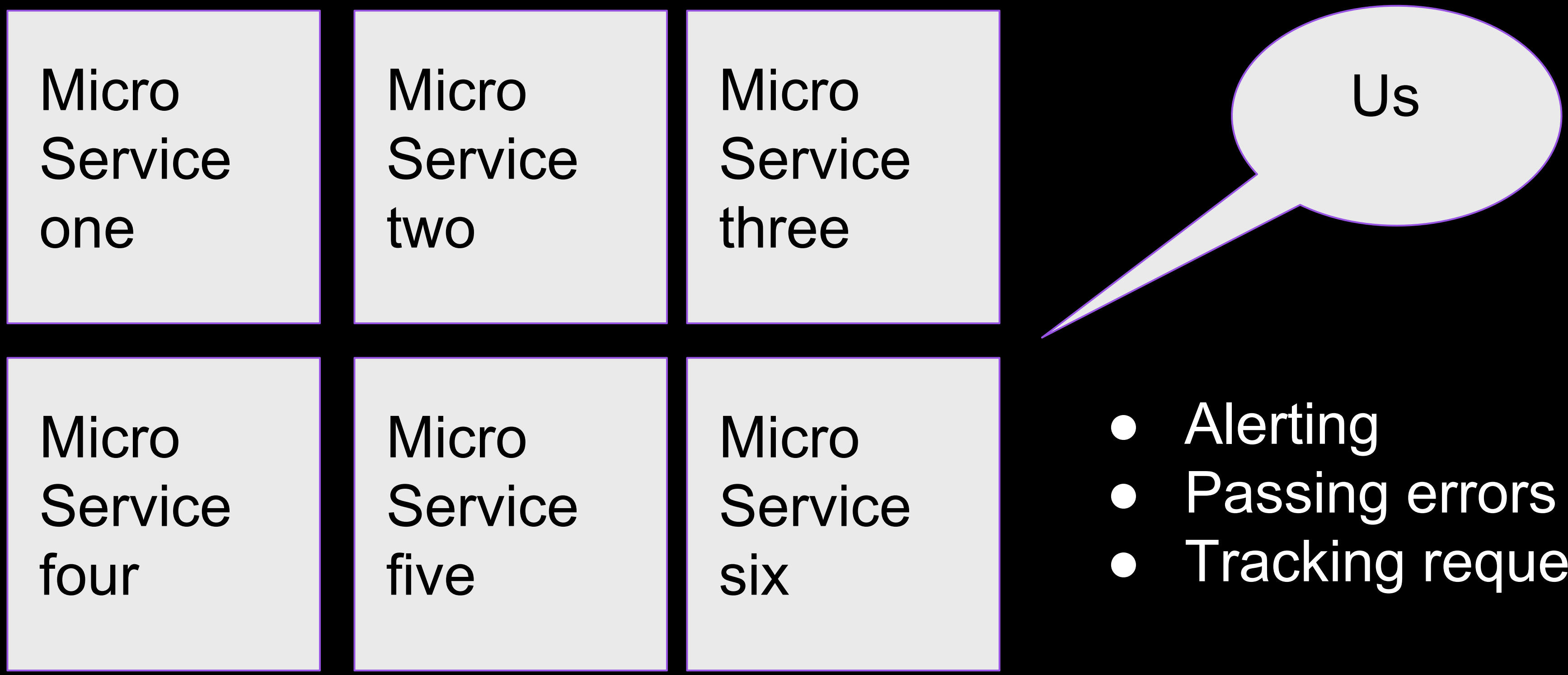
Lessons Learned

“Are we treating our microservices as parts of a whole?”



Lessons Learned

“Are we treating our microservices as parts of a whole?”



Micro Service one

Micro Service two

Micro Service three

Micro Service four

Micro Service five

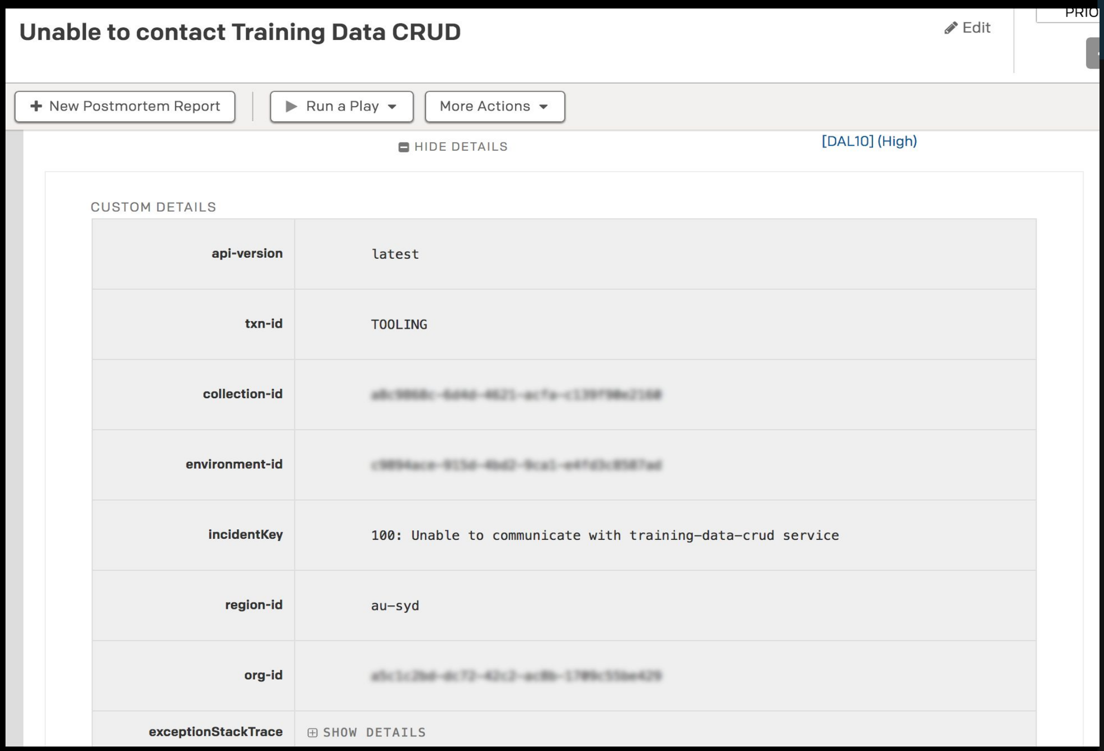
Micro Service six

Us

- Alerting
- Passing errors upstream
- Tracking requests through entire stack

Lessons Learned

“What is the information I need first when there is a problem?”



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[DAL10] (High)

CUSTOM DETAILS

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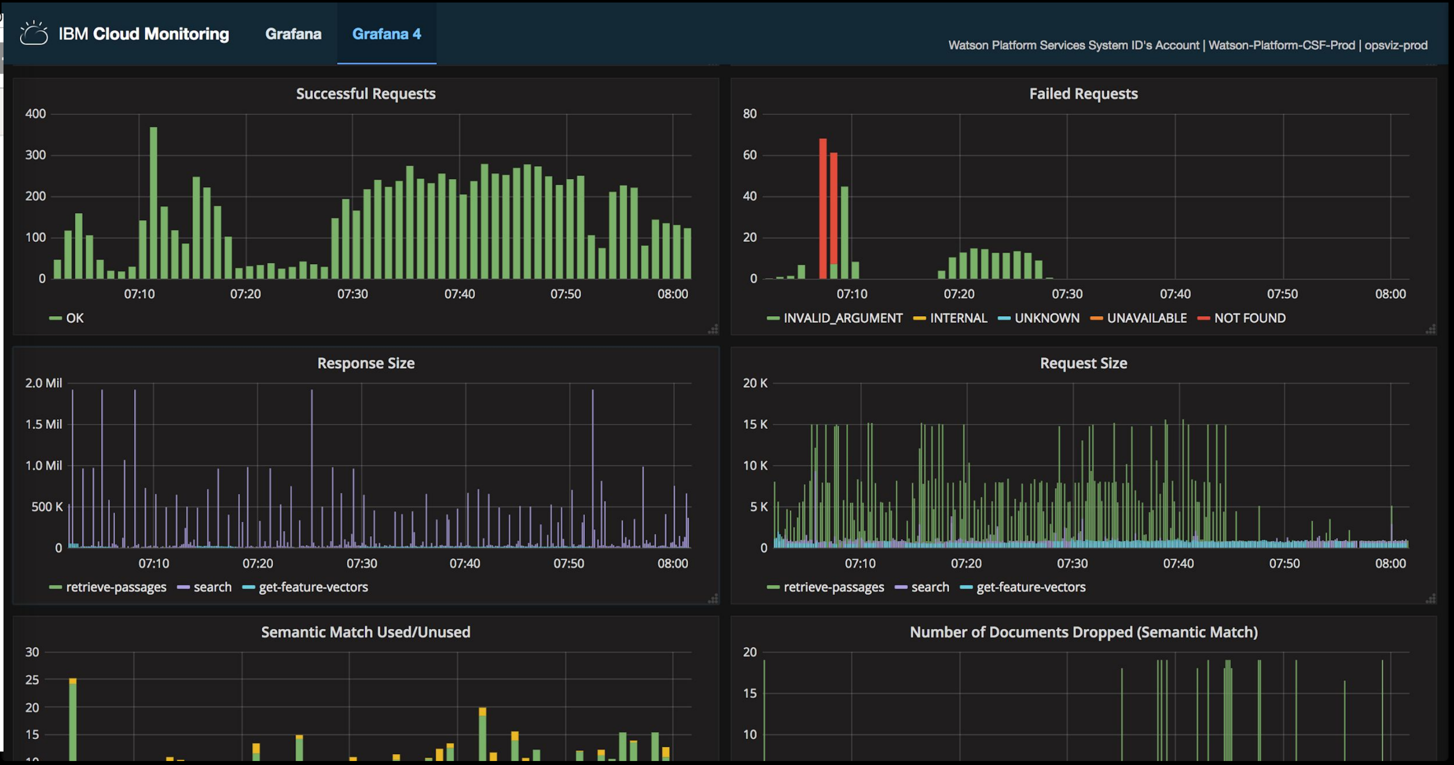

Lessons Learned

“I found the problem, now how do I fix the cause?”

Final Thoughts

- Your first 4-6 months will suuuuuccckkk
- Use our questions to point yourself in the right direction

Thanks

Michael Keeling

Anastas Stoyanovsky

Wentao Jiang

Chuck Gala

Joe Runde

Extra Special Thanks to Eric Kaun

“Before pager duty, these pants were white!”

That's all Folks!