

BY OUR POWERS COMBINED: OBSERVABILITY FOR DEVELOPERS

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HI, CODEMASH! 🖐️



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🐦 : @CRAYZEIGH

✉️ : AARON.ALDRICH@ELASTIC.CO

🌐 : NOTI.ST/CRAYZEIGH



OBSERVABILITY

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DEVELOPS

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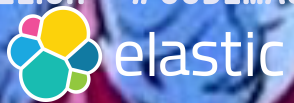
DEVOPS

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DEV



Change



OPS



Stability



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DEVOPS

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DEVOPS

> **WAVE 1: OPS** LEARNS **CODE** & AUTOMATION

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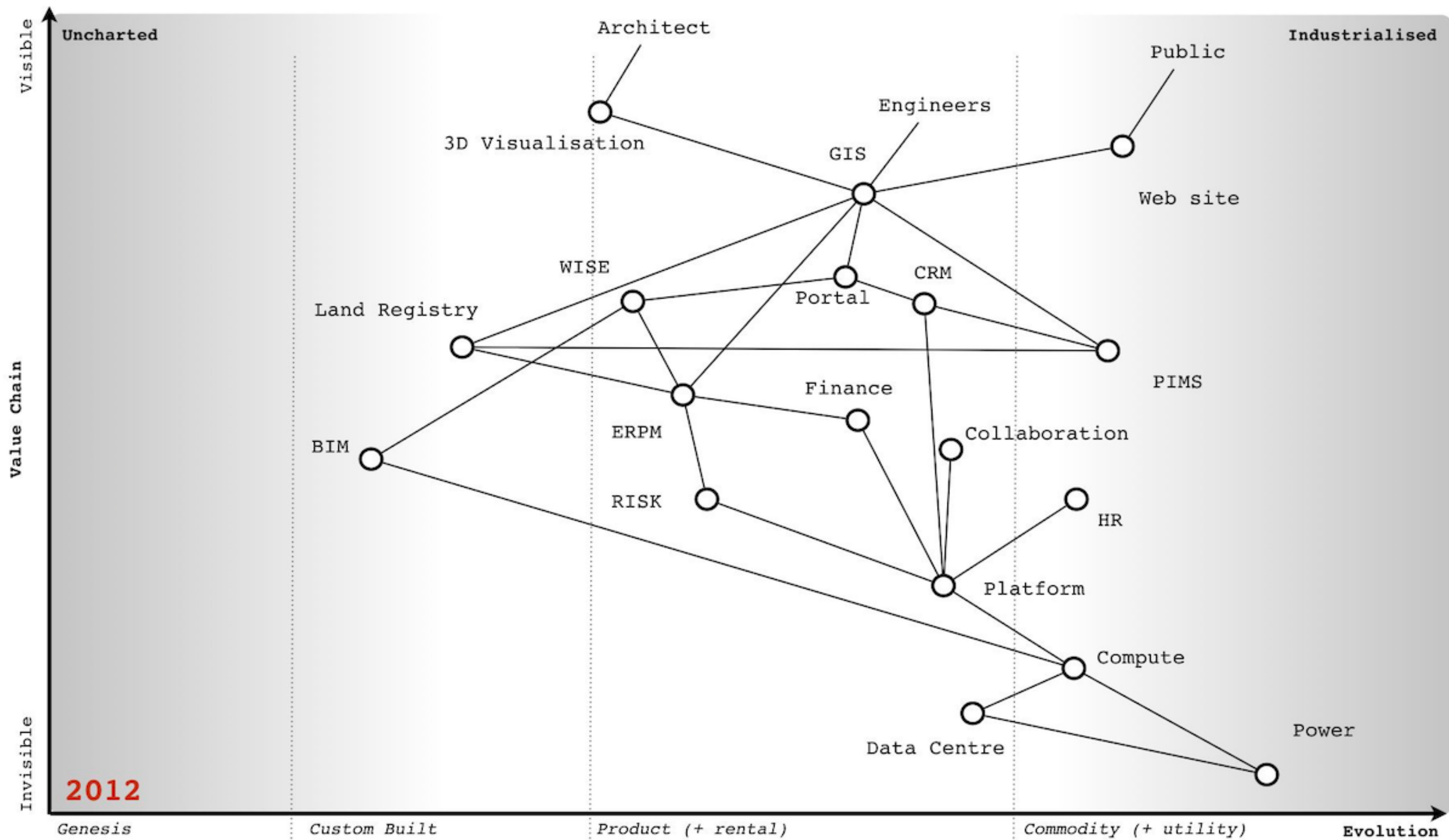
DEVOPS

- > **WAVE 1: OPS** LEARNS **CODE** & AUTOMATION
- > **WAVE 2: DEV** OWNS CODE THROUGH **PRODUCTION**¹

¹[HTTPS://VIMEO.COM/341142053](https://vimeo.com/341142053)

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[HTTPS://DEV.TO/MOLLY_STRUVE/MAKING-ON-CALL-NOT-SUCK-490](https://dev.to/molly_struve/making-on-call-not-suck-490)



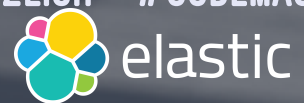
SHARED LANGUAGE

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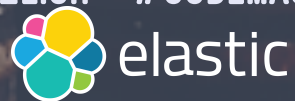
SHARED TOOLS

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SHARED SOURCE OF TRUTH

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ISN'T IT JUST MONITORING WITH
BETTER SEO?

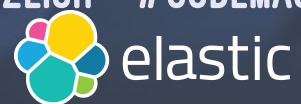
- YOU

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YOU'RE NOT WRONG...

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Jennifer Brea



@jenbrea

"We have a saying in medicine that when you hear hoofbeats, the first thing that should come to mind is a horse, not a zebra."
This too cute by half phrase has killed so many zebras.

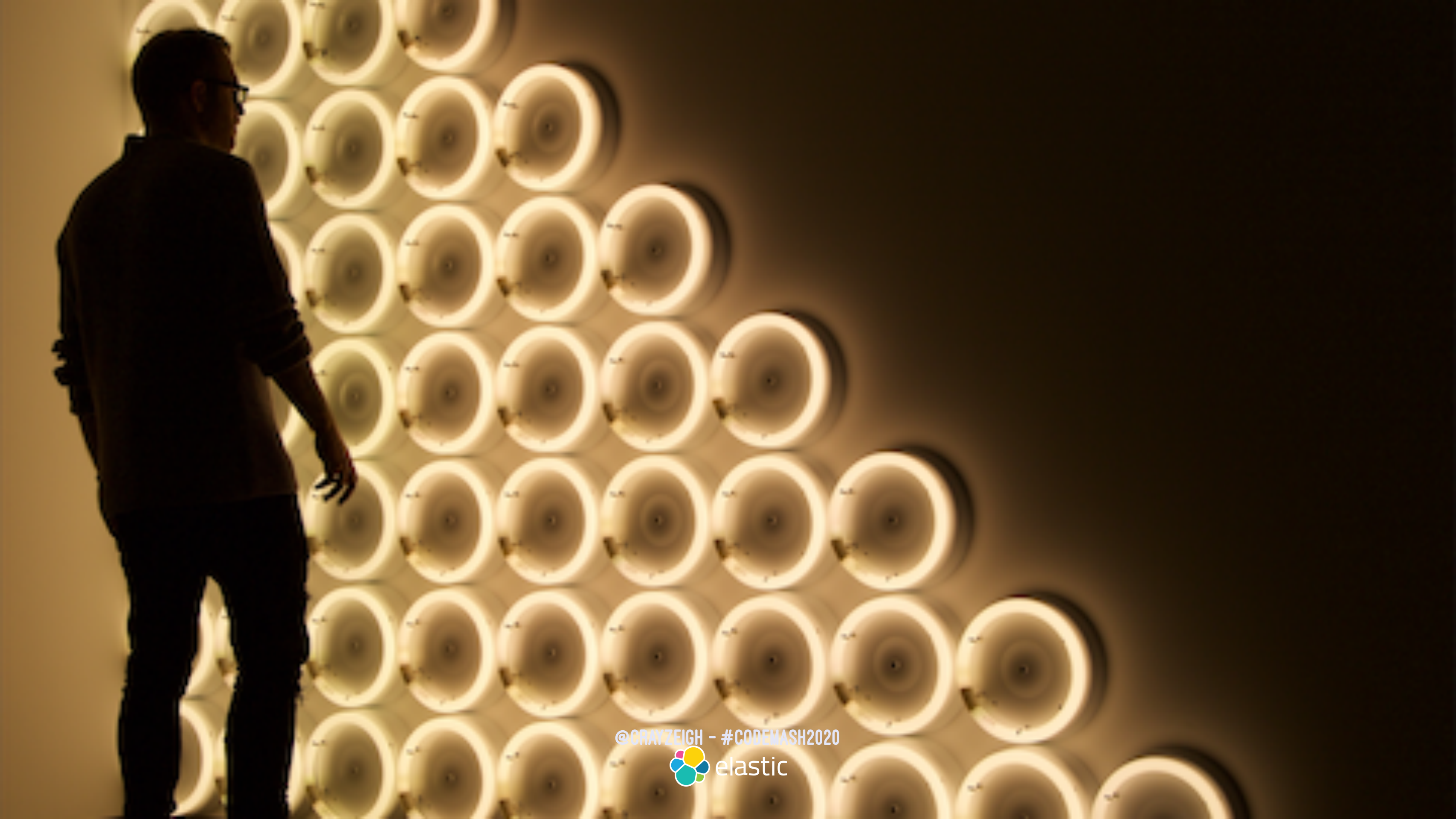
[@raf_ideas](#) [#Afflicted](#)

♥ 481 12:35 AM - Aug 14, 2018



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MONITORING

TRACKING SYSTEM HEALTH AND WATCHING FOR KNOWN FAILURE CONDITIONS. GOOD FOR TRACKING KNOWN UNKNOWNNS AND GENERATING FAILURE ALERTS FOR OPERATIONAL ISSUES.

DEBUGGING OFTEN REQUIRES FURTHER INVESTIGATION OF SYSTEMS AND FAILURE STATE RECREATION.

FINDS HORSES.

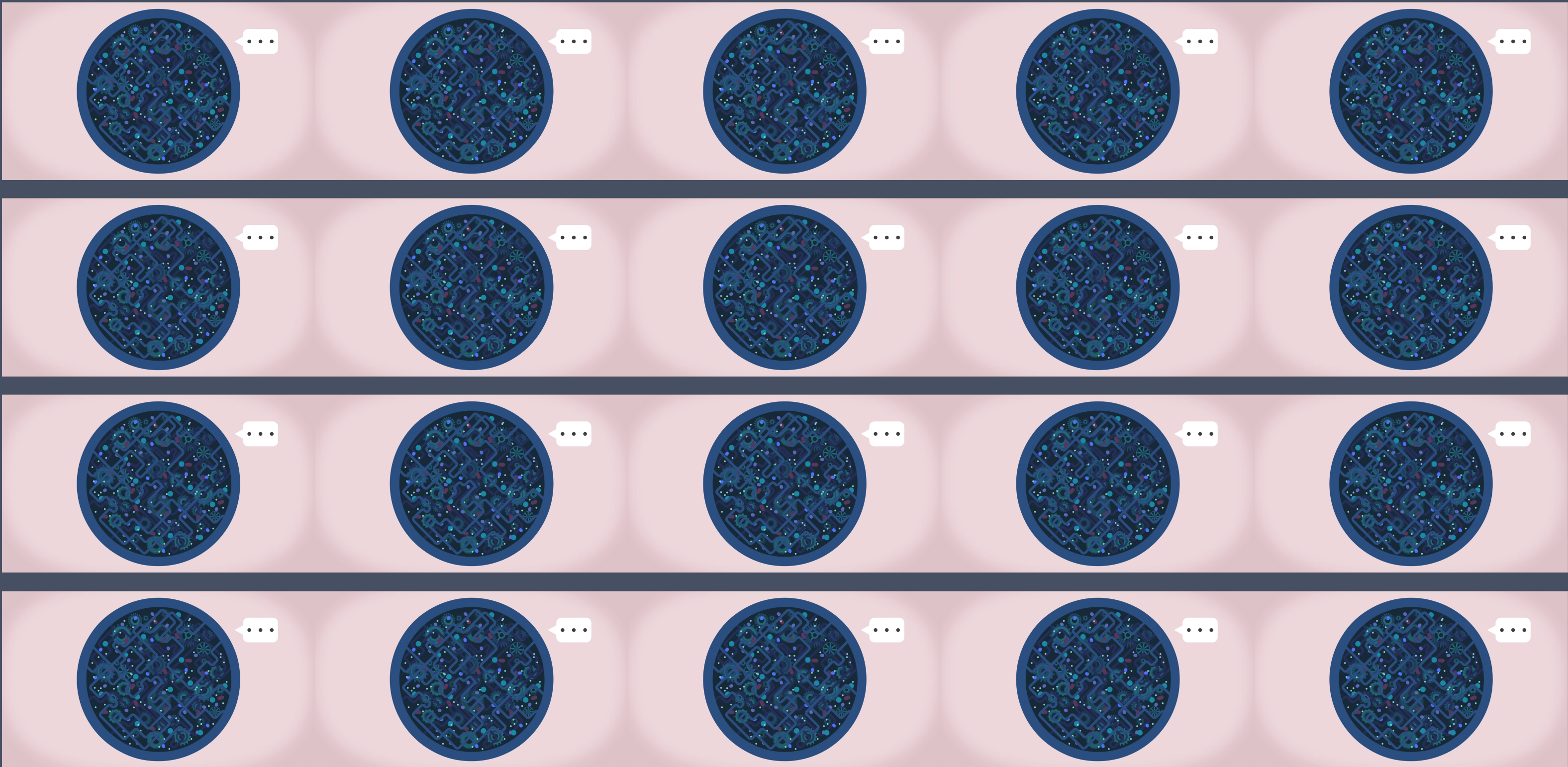
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THERE IS

NO ROOT CAUSE

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OBSERVABILITY

A SYSTEM IS OBSERVABLE WHEN YOU CAN ASK ARBITRARY QUESTIONS ABOUT IT AND RECEIVE MEANINGFUL ANSWERS WITHOUT HAVING TO RESORT TO WRITING NEW CODE OR COMMAND LINE TOOLS.

IT LETS YOU DISCOVER UNKNOWN-UNKNOWNNS AND DEBUG IN PRODUCTION.

HELPS DEBUG ZEBRAS.

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**SOFTWARE IS INHERENTLY OPAQUE. WE
HAVE TO INSTRUMENT IT TO OUTPUT
MEANINGFUL INFORMATION**

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THE THREE PILLARS OF OBSERVABILITY

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THE THREE PILLARS OF OBSERVABILITY

1. LOGS

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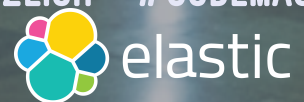


THE THREE PILLARS OF OBSERVABILITY

1. LOGS

2. METRICS

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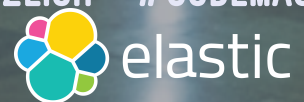
THE THREE PILLARS OF OBSERVABILITY

1. LOGS

2. METRICS

3. APM

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THE THREE PILLARS OF OBSERVABILITY

1. LOGS EVENTS

2. METRICS

3. APM

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THE THREE PILLARS OF OBSERVABILITY

1. LOGS EVENTS

2. METRICS

3. APM

4. DISTRIBUTED TRACING

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THE THREE PILLARS OF OBSERVABILITY

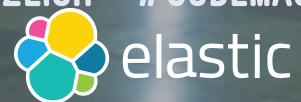
1. LOGS EVENTS

2. METRICS

3. APM & DISTRIBUTED TRACING

4. ~~DISTRIBUTED TRACING~~

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LOGS / METRICS / APM
ARE THE MEDIA WE WORK IN

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+ Add filter

icbeat] MySQL Metrics

202.627 Average Opened Tables

1.039 Average Threads

6,423,741 Select Commands

48,640 Delete Commands

65 Connections

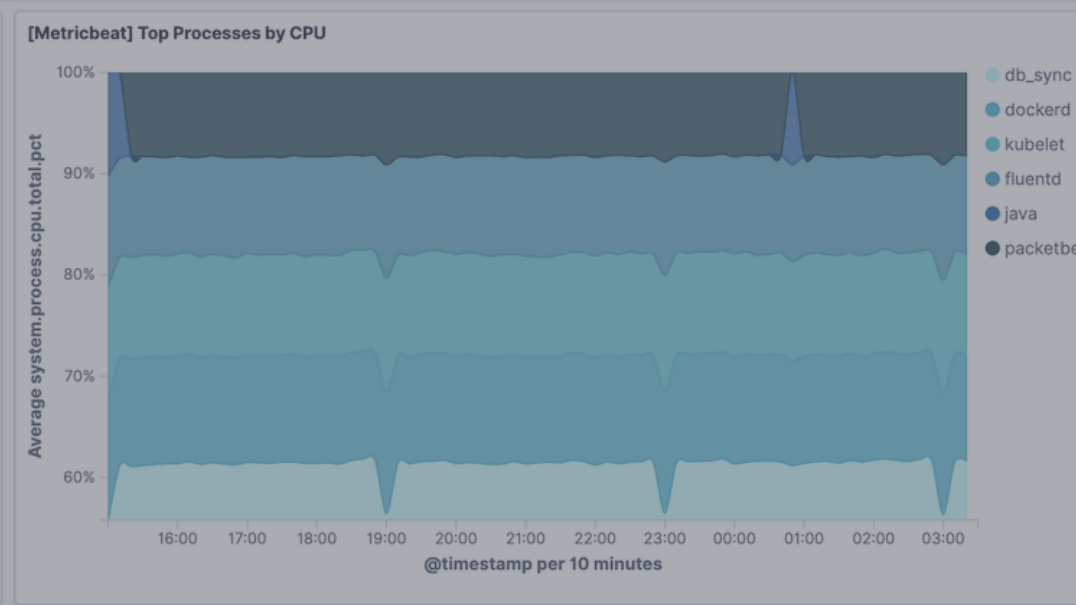
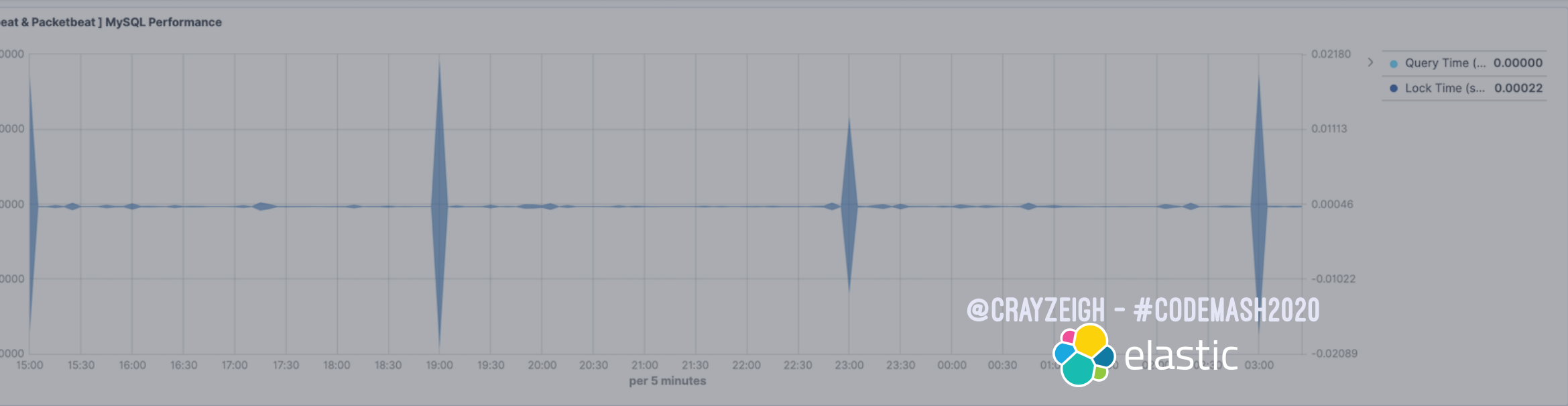
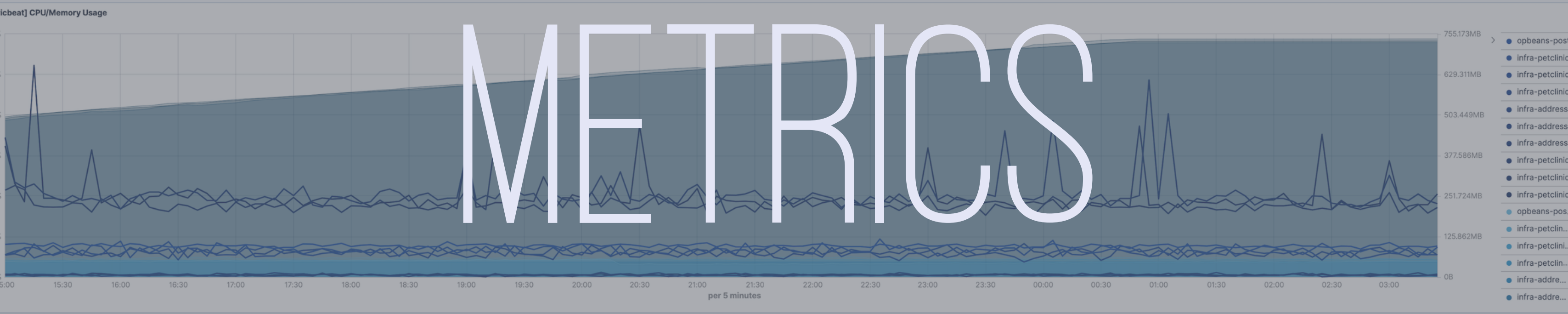
K8 Controls - 2

Pod:

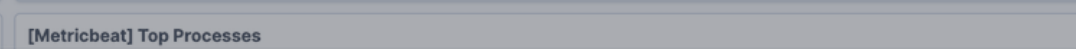
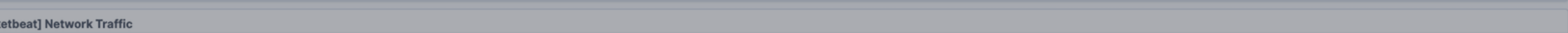
Container:

Nodes, Pods & Containers

Pod Name	Container Name	Co
infra-petclinic-client-7b9644b6c8-v5q28	infra-demo-petclinic-nginx	145
infra-petclinic-client-7b9644b6c8-v5q28	infra-demo-petclinic-client	92
infra-petclinic-client-7b9644b6c8-8zvdv	infra-demo-petclinic-nginx	147
infra-petclinic-client-7b9644b6c8-8zvdv	infra-demo-petclinic-client	88
infra-petclinic-client-7b9644b6c8-hjjsq	infra-demo-petclinic-nginx	140



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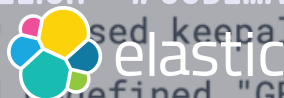
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```
# Time: 2018-11-27T23:59:26.375064Z
18:59:22.595 POST /api/specialties 201 14.847 ms - 42
18:59:22.668 GET /api/vets?Accept=application/json;charset=UTF-8 200 33.577 ms - 4901
18:59:22.690 POST /api/visits 500 0.949 ms - 665
18:59:22.696 Sending error to Elastic APM { id: '3c846fde4fcdaae8d9e370246b53ec02' }
18:59:22.833 GET /api/vets?Accept=application/json;charset=UTF-8 200 43.512 ms - 4901
18:59:22.991 GET /api/owners 200 101.692 ms - 37307
18:59:23.000 [nginx][access] undefined undefined "POST /api/find_state HTTP/1.1" 200 51
18:59:23.000 [nginx][access] undefined undefined "GET /petclinic/api/owners/41 HTTP/1.1" 200 600
18:59:23.000 [nginx][access] undefined undefined "GET /server-status HTTP/1.1" 200 110
18:59:23.000 [nginx][access] undefined undefined "POST /api/find_state HTTP/1.1" 200 51
18:59:23.000 [info] client 10.56.0.149 closed keepalive connection
18:59:23.000 [nginx][access] undefined undefined "GET /api/owners/41 HTTP/1.1" 304 0
18:59:23.000 [nginx][access] undefined undefined "GET /server-status HTTP/1.1" 200 112
18:59:23.479 POST /api/find_state 200 453.049 ms - 51
18:59:23.946 GET /healthcheck 200 0.70 ms - 6
18:59:23.979 GET /api/owners/41 304 16.388 ms - -
18:59:24.000 [error] connect() failed (111: Connection refused) while connecting to upstream, client: 10.56.2.85, server: infra-address-finder-549cd4684f-7vm9v, request: "POST /api/find_city HTTP/1.1", upstream: "http://[::1]:5000/api/find_city", host: "infra-petclinic-client-7b9644b6c8-hjjsq"
18:59:24.000 [warn] upstream server temporarily disabled while connecting to upstream, client: 10.56.2.85, server: infra-address-finder-549cd4684f-7vm9v, request: "POST /api/find_city HTTP/1.1", upstream: "http://[::1]:5000/api/find_city", host: "infra-petclinic-client-7b9644b6c8-hjjsq"
18:59:24.000 [nginx][access] undefined undefined "POST /api/find_city HTTP/1.1" 200 49
18:59:24.000 [nginx][access] undefined undefined "POST /api/find_city HTTP/1.1" 200 49
18:59:24.481 POST /api/find_city 200 64.872 ms - 49
18:59:25.000 [info] client 10.56.0.149 closed keepalive connection
18:59:25.000 [info] client 10.56.0.149 closed keepalive connection
18:59:25.000 [nginx][access] undefined undefined "GET /petclinic/api/pettyypes?Accept=application/json;charset=UTF-8 HTTP/1.1" 200 4139
```

EVENTS

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elastic

CARDINALITY

& YOU

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EXISTING LOGS

```
66.249.65.159 - - [06/Nov/2014:19:10:38 +0600] "GET /news/53f8d72920ba2744fe873ebc.html HTTP/1.1" 404 177
 "-" "Mozilla/5.0 (iPhone; CPU iPhone OS 6_0 like Mac OS X) AppleWebKit/536.26 (KHTML, like Gecko) Version
 /6.0 Mobile/10A5376e Safari/8536.25 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.65.3 - - [06/Nov/2014:19:11:24 +0600] "GET /?q=%E0%A6%AB%E0%A6%BE%E0%A7%9F%E0%A6%BE%E0%A6%B0 HTTP/
 1.1" 200 4223 "-" "Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.65.62 - - [06/Nov/2014:19:12:14 +0600] "GET /?q=%E0%A6%A6%E0%A7%8B%E0%A7%9F%E0%A6%BE HTTP/1.1" 200
 4356 "-" "Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
```

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STRUCTURED LOGGING

```
{
  "@timestamp": "2019-08-04T12:30:04.000Z",
  ...
  "container": {
    "image.id": "48f5af6667f3457be0a2c7814caefe21ed3c94fb94bd6243096b3a61ea502b1d",
    "version": "version",
  },
  "build.id": "efdd0b5e69b0742fa5e5bad0771df4d1df2459d1"
  ...
  "transaction": "transaction_ID",
  "user": "importantPerson",
  "account": "0129",
  "os": "osx",
  ...
  "api_endpoint": "endpoint",
  ...
  "response": 400,
  ...
  "message": "Some informative thing, probably more human readable and friendly, but difficult to parse"
}
```

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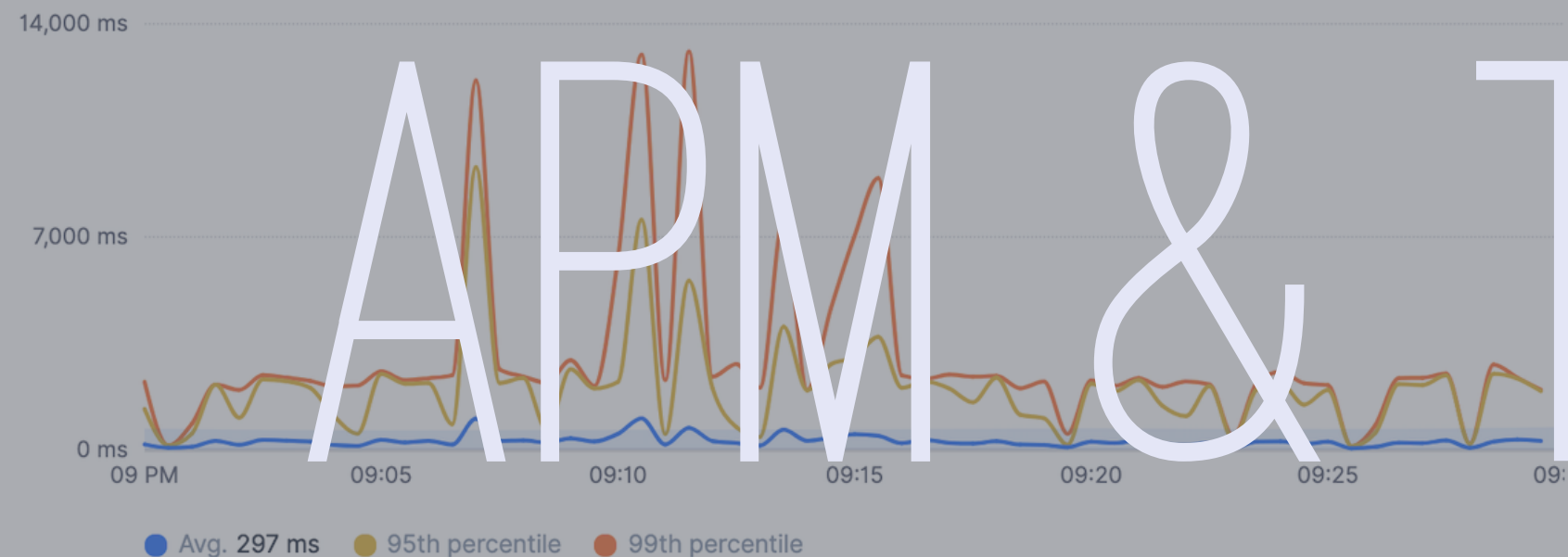
Transactions Errors

Filter by type

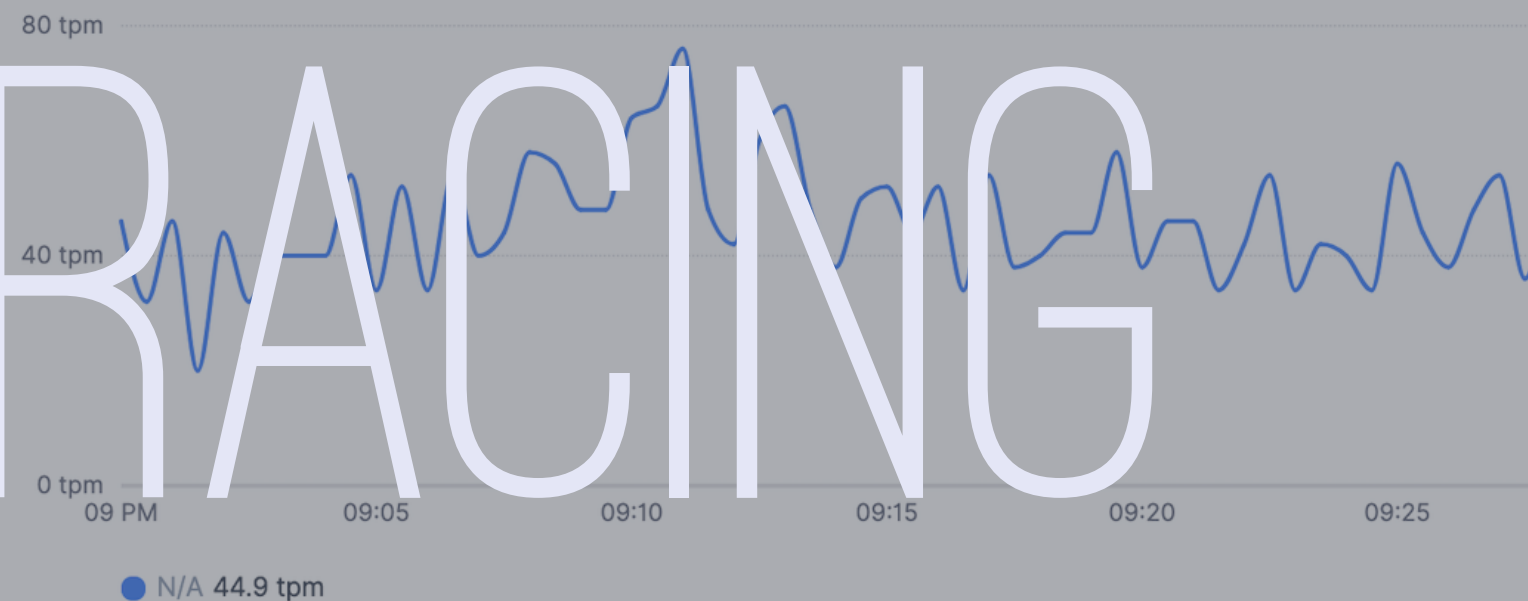
Events

Transaction duration

Machine learning: View Job



Transactions per minute



Transactions

Name	Avg. duration	95th percentile ↓	Trans. per minute
UpdateOwner	2,451 ms	12,566 ms	1.3 tpm
EditOwnerPage	221 ms	2,341 ms	1.4 tpm
VetsPage	254 ms	2,313 ms	4.2 tpm
FindOwnersPage	337 ms	2,272 ms	11.5 tpm
OwnersPage	209 ms	1,994 ms	11.5 tpm
ErrorPage	147 ms	1,847 ms	3.0 tpm

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Transaction sample

Actions ▾

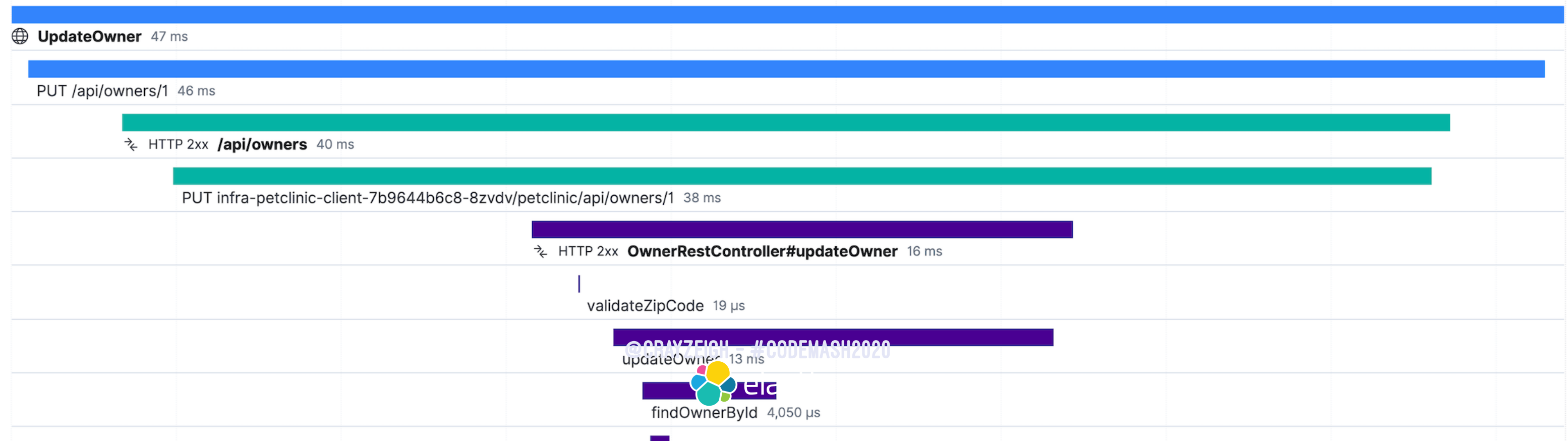
View full trace

Timestamp		URL			
9 months ago (November 27th 2018, 21:10:09.008)		N/A			
Duration	% of trace	Result	Errors	User ID	
47 ms	100.0%	N/A	None	brist1y	
User agent	User agent OS	User agent device			
Chrome 19.0.1055	Mac OS X 10.7.2	Other			

Timeline Metadata

Services ● petclinic-react ● petclinic-node ● petclinic-spring

0 ms 5 ms 10 ms 15 ms 20 ms 25 ms 30 ms 35 ms 40 ms 47 ms



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Transaction sample

Actions

View full t

mp
ths ago (November 27th 2018, 21:10:40.265)

URL
N/A

ms
% of trace
100.0%

Result
N/A
Errors
None

User ID
dalem

ent
e 70.0.3538
User agent OS
Mac OS X 10.14.0

User agent device
Other

Timeline Metadata

petclinic-react petclinic-node petclinic-spring

ms 1,000 ms 2,000 ms 3,000 ms 4,000 ms 5,000 ms 6,000 ms 7,279



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updateOwner 1,642 μs

SHARED LANGUAGE



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SHARED LANGUAGE

> LEARNING TO SPEAK PROD

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SHARED LANGUAGE

> LEARNING TO SPEAK PROD

> TEACHING PROD TO SPEAK DEV (STRUCTURED LOGS: TRACES)

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SLI/SLO/SLA

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SYSTEMS RELIABILITY ENGINEERING

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SYSTEMS RELIABILITY ENGINEERING

> **SLI**: SERVICE LEVEL INDICATOR

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SYSTEMS RELIABILITY ENGINEERING

- > **SLI**: SERVICE LEVEL INDICATOR
- > **SLO**: SERVICE LEVEL OBJECTIVE

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SYSTEMS RELIABILITY ENGINEERING

- > **SLI**: SERVICE LEVEL INDICATOR
- > **SLO**: SERVICE LEVEL OBJECTIVE
- > **SLA**: SERVICE LEVEL AGREEMENT

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SYSTEMS RELIABILITY ENGINEERING

- > **SLI**: SERVICE LEVEL INDICATOR
- > **SLO**: SERVICE LEVEL OBJECTIVE
- > ~~**SLA**: SERVICE LEVEL AGREEMENT~~ 

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SHARED LANGUAGE

> LEARNING TO SPEAK PROD

> TEACHING PROD TO SPEAK DEV (STRUCTURED LOGS: TRACES)

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SHARED LANGUAGE

- LEARNING TO SPEAK PROD
- TEACHING PROD TO SPEAK DEV (STRUCTURED LOGS: TRACES)
- SPEAKING DIRECTLY TO BUSINESS VALUE & CUSTOMER EXPERIENCE

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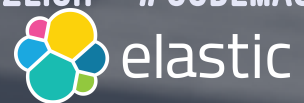
SHARED TOOLS



SHARED TOOLS

> DEBUGGING IN PROD

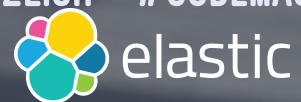
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SHARED TOOLS

- > DEBUGGING IN PROD
- > OPS SKILLS TRANSFERRABLE AND REPLICABLE

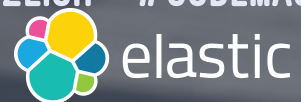
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SHARED TOOLS

- > **DEBUGGING IN PROD**
- > **OPS SKILLS TRANSFERRABLE AND REPLICABLE**
- > **NEW KNOWLEDGE AND METHODS SHAREABLE**

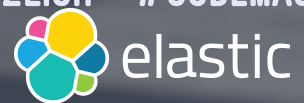
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CONVERGED TOOLSETS



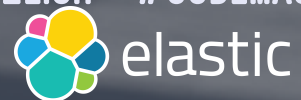
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CONVERGED TOOLSETS

- > **SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING**

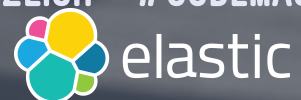
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CONVERGED TOOLSETS

- > SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING
- > ANY ARBITRARY BUSINESS DATA CAN BE ADDED AND CORRELATED

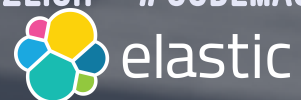
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CONVERGED TOOLSETS

- > SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING
- > ANY ARBITRARY BUSINESS DATA CAN BE ADDED AND CORRELATED
 - > SIEM & INFOSEC

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Add Data to Kibana

Use these solutions to quickly turn your data into pre-built dashboards and monitoring systems.



APM

APM automatically collects in-depth performance metrics and errors from inside your applications.

[Add APM](#)



Logging

Ingest logs from popular data sources and easily visualize in preconfigured dashboards.

[Add log data](#)



Metrics

Collect metrics from the operating system and services running on your servers.

[Add metric data](#)



SIEM

Centralize security events for interactive investigation in ready-to-go visualizations.

[Add security events](#)

Add sample data

[Load a data set and a Kibana dashboard](#)

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Upload data from log file

[Import a CSV, NDJSON, or log file](#)

Use Elasticsearch data

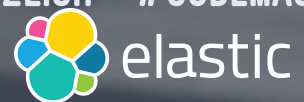
[Connect to your Elasticsearch index](#)

CONVERGED TOOLSETS ⚠️



⚠️ **VENDOR WARNING**

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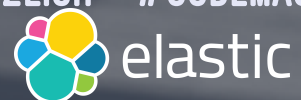


CONVERGED TOOLSETS

- > SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING

 **VENDOR WARNING**

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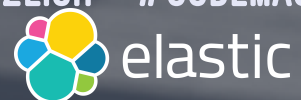


CONVERGED TOOLSETS

- > SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING
- > ANY ARBITRARY BUSINESS DATA CAN BE ADDED AND CORRELATED (ECS)

 VENDOR WARNING

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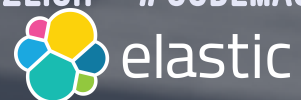


CONVERGED TOOLSETS

- > SINGLE PLATFORM FOR ALL DATA MEANS EASY, IMPROVED DEBUGGING
- > ANY ARBITRARY BUSINESS DATA CAN BE ADDED AND CORRELATED (ECS)
 - > SIEM & INFOSEC

 **VENDOR WARNING**

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SHARED SOURCE OF TRUTH

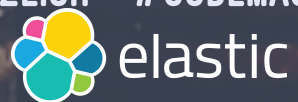
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SHARED SOURCE OF TRUTH

> REAL PRODUCTION DATA

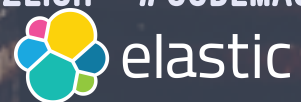
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SHARED SOURCE OF TRUTH

- > REAL PRODUCTION DATA
- > DRAW BETTER LINES FROM CODE TO PROD

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SHARED SOURCE OF TRUTH

- > REAL PRODUCTION DATA
- > DRAW BETTER LINES FROM CODE TO PROD
- > WRITE BETTER, PRODUCTION READY CODE.

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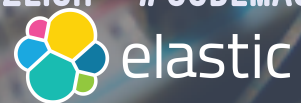
WHERE DO WE GO FROM HERE?

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TESTING & EXPERIMENTATION

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TEST IN PRODUCTION

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Michael Stahnke

@stahnma



Everybody has a testing environment. Some people are lucky enough enough to have a totally separate environment to run production in.

♡ 433 6:07 PM - Aug 21, 2015



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FEATURE

FLAGS



 [HTTPS://MARTINFOWLER.COM/ARTICLES/FEATURE-TOGGLES.HTML](https://martinfowler.com/articles/feature-toggles.html)

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CONFIG.JSON

```
{  
  "featureFlags": {  
    "newThing": true,  
  }  
}
```

APP.JS

```
import { featureFlags } from "./config.json"  
  
if (featureFlags.newThing) {  
  // do the new thing!  
}  
else {  
  // do the old thing!  
}
```

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DON'T DEBATE
EXPERIMENT

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SPEAKING OF TESTING²:

QA

² [HTTPS://THEELASTICAST.COM/EPISODES/0017-QA/](https://theelasticast.com/episodes/0017-QA/)

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NETFLIX



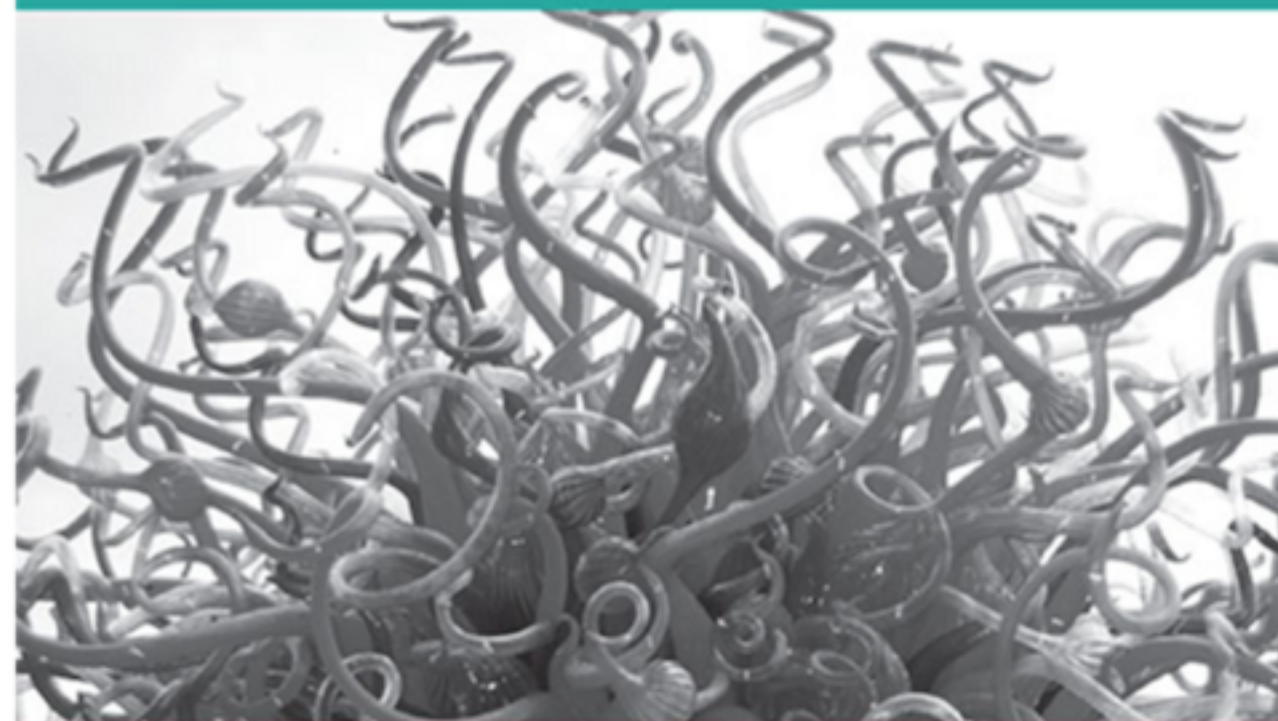
**SIMIEN
ARMY**

O'REILLY®

Chaos Engineering

Building Confidence in System Behavior
through Experiments

Compliments of
NETFLIX



Casey Rosenthal, Lorin Hochstein,
Aaron Blohowiak, Nora Jones
& Ali Basiri

**CHAOS ENGINEERING IS ABOUT
REFINING OUR MENTAL MODELS**

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DEVOPS

- > **WAVE 1: OPS** LEARNS **CODE** & AUTOMATION
- > **WAVE 2: DEV** OWNS CODE THROUGH **PRODUCTION**¹

¹[HTTPS://VIMEO.COM/341142053](https://vimeo.com/341142053)

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DEV OWNS CODE THROUGH PRODUCTION

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DEV OWNS CODE THROUGH PRODUCTION

- > BETTER, MORE PRODUCTION-READY CODE

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DEV OWNS CODE THROUGH PRODUCTION

- > BETTER, MORE PRODUCTION-READY CODE
 - > REAL WORLD EXPERIMENTATION

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DEV OWNS CODE THROUGH PRODUCTION

- > BETTER, MORE PRODUCTION-READY CODE
 - > REAL WORLD EXPERIMENTATION
- > IMPROVED OPERATIONAL RESILIENCY

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THE POWER
IS YOURS

THANKS!

- > SLIDES & REFERENCES: [NOTI.ST/CRAYZEIGH](https://noti.st/crayzeigh)
- > TRIAL: [ELA.ST/AARON-ALDRICH-TRIAL](https://ela.st/aaron-aldrich-trial)
- > COME SAY, "HI!" AT THE **ELASTIC BOOTH (N6)**
- > **CHECK OUT ELASTIC APM @ 14:00 IN SALON A!**

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