From Grief to Growth: The 7 Stages of Observability

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Bonjour-Hi!

Outdoorsy, data-driven, eternal student, not so geeky creative mind and traveler. Alex is a curious, **introverted** and humble character. Working by day as a **Senior Software Developer** at **Datawire** he has many years of savoir-faire building full-stack systems from cloud infrastructures to backend services and DevOps tools. Alex is a **Kubernetes** early adopter who thrives on collaboration and contributor to many **Cloud-Native** projects.

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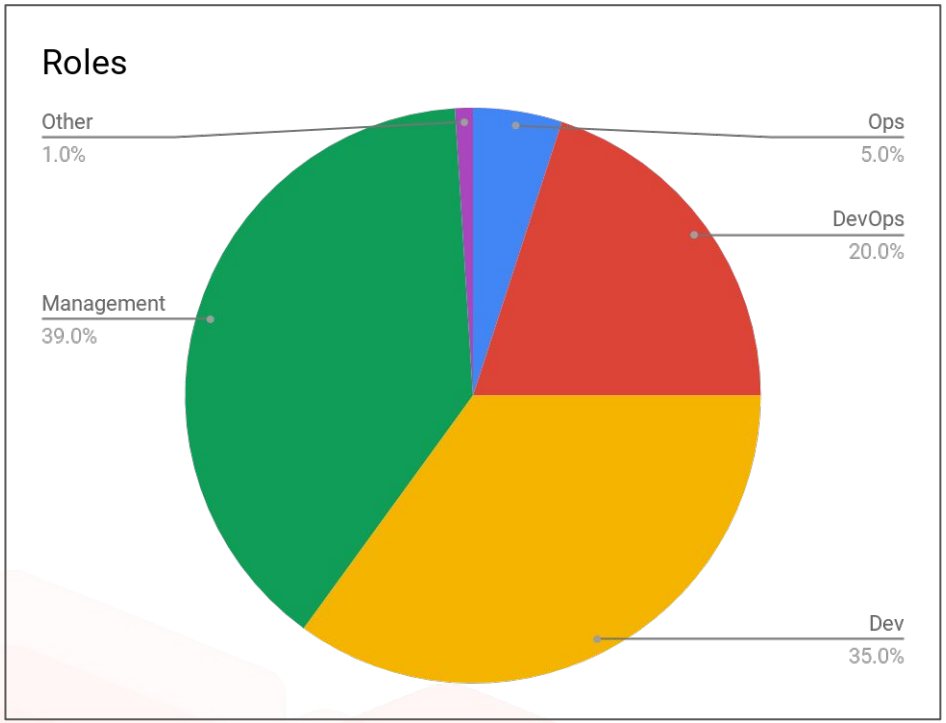
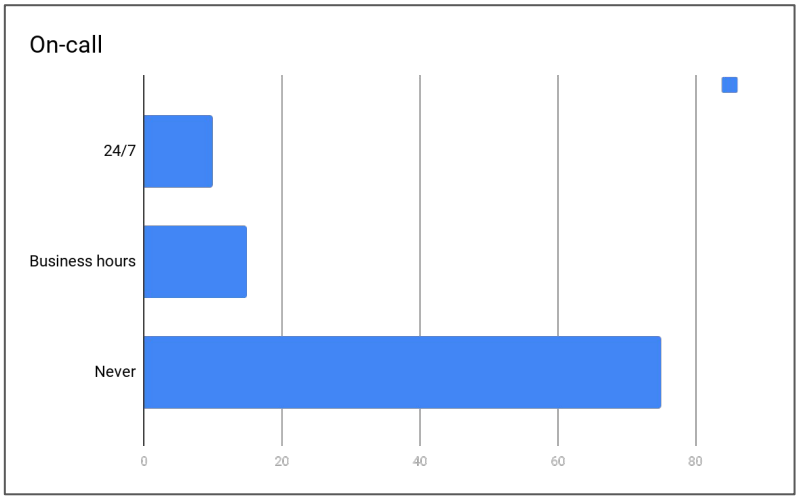
Table of Contents

Prediction time...



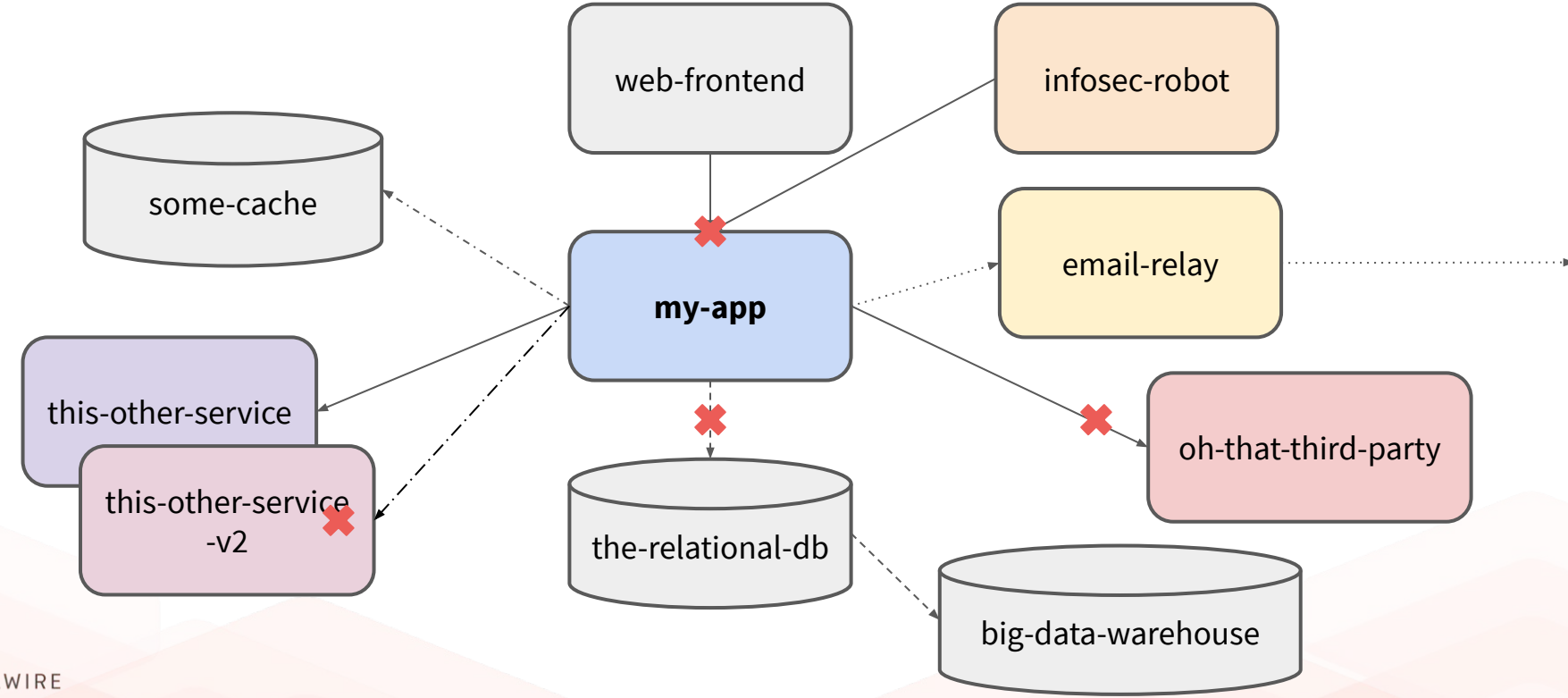


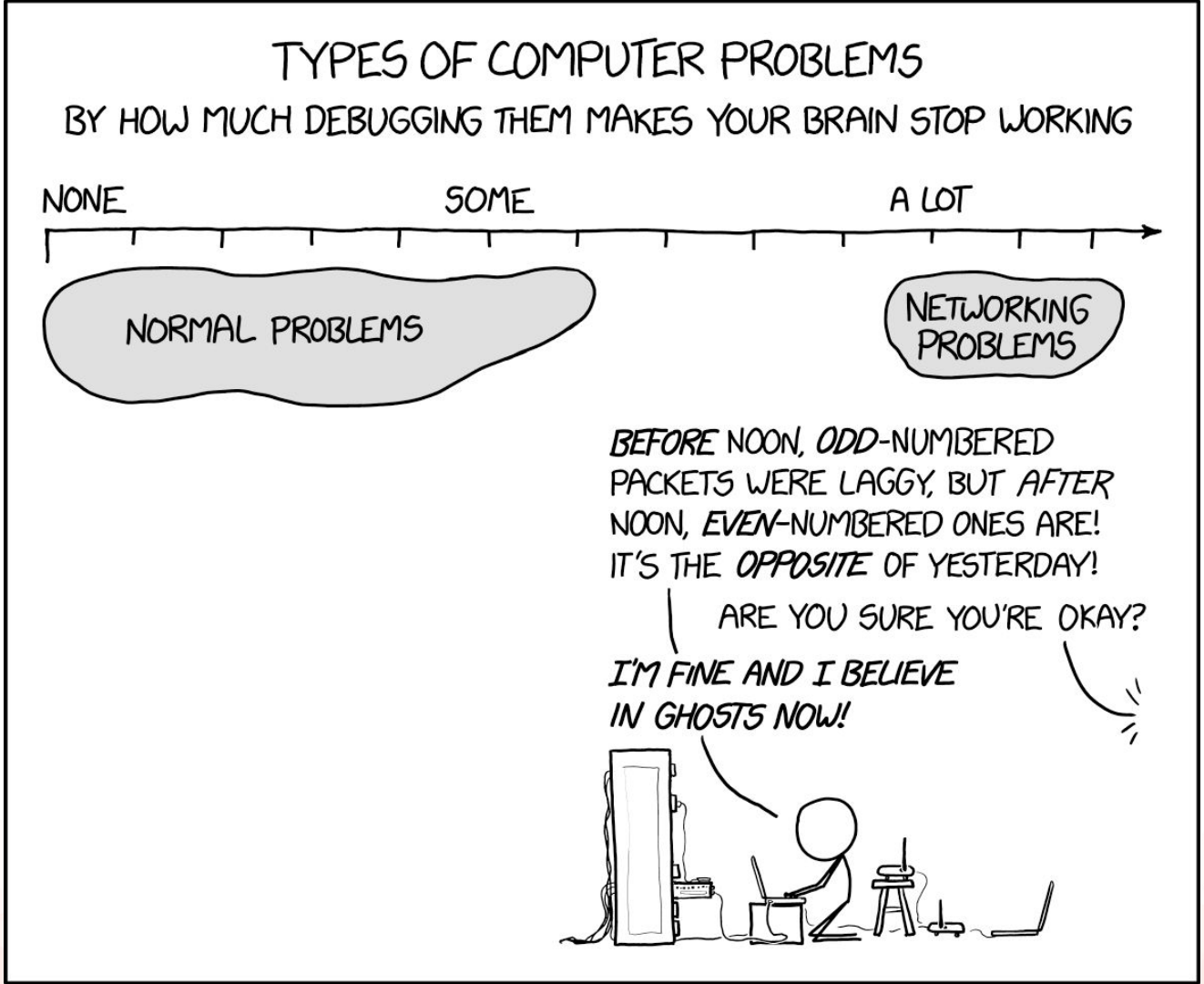
Serverless will take over the world.

The story

only the names have been changed to protect the innocent

Monoliths and Distributed Applications




TYPES OF COMPUTER PROBLEMS
BY HOW MUCH DEBUGGING THEM MAKES YOUR BRAIN STOP WORKING
NONE
SOME
A LOT
NORMAL PROBLEMS
NETWORKING PROBLEMS
BEFORE NOON, ODD-NUMBERED PACKETS WERE LAGGY, BUT AFTER NOON, EVEN-NUMBERED ONES ARE! IT'S THE OPPOSITE OF YESTERDAY!
ARE YOU SURE YOU'RE OKAY?
I'M FINE AND I BELIEVE IN GHOSTS NOW!

DATAWIRE

In the Monolith era, we were equipped with

- Log files and `tail`, `grep`, and more
- `curl`, `tcpdump`, `dig`, and more
- IDE debuggers
- Some form of APM
- Classic monitoring such as Nagios, Pingdom, and more

Business-critical operations

Who’s monitoring the user experience and satisfaction?

Are we equipped to face traffic bursts?

How is our release process and QA culture impacting release frequency AND quality?

Who owns each project and component?

Grief

deep sorrow, especially that caused by someone's death

This is soooo complicated...

- We have downtimes, failures, unstable environments and the infrastructure footprint is increasing
- Everything comes up as a SURPRISE!
- Failures are everywhere: in infrastructure, in applications, in configuration
- Failures are visible: in degraded performance, in bugs, in downtime
- Fatigue

To delight our customers with our SaaS offering,
our problem was…

How could we reach operational excellence and share ownership effectively?

Objectives

- Increase our global comprehension of the system
- Improve the platform stability
- Find owners for each component and involve them in operational work
- State of the art observability

Confusion

lack of understanding; uncertainty

Blind operations

- We have all these metrics and data sources, but we are still operating in the dark
- Too many tools, no trustable source of truth
- No runbooks
- Clients report errors, slowness and downtimes before we catch them… That’s not good!
- An easy prey for vendors

Concepts

Service-Level Indicator - *SLI*

Service-Level Objective - *SLO*

Service-Level Agreement - *SLA*

Error budgets (P99)

Distinguish the types of error:

bugs vs performance; app vs infra vs config

Monitoring is your bank telling you you're overdrawn. Observability is the ability to tell you're running out of money because you're spending too much money on chocolates, cakes and sweets because you've recorded data on what you spent your money on throughout the month.
twitter.com/lizthegrey/sta…

Liz Fong-Jones (方禮真) @lizthegrey
5:15pm - 21 Feb 2020

Envy

a feeling of discontented or resentful longing aroused by someone else's possessions, qualities, or luck

Keep on dreaming

- Case studies, blogs, and vendor pitches
- Conferences and learning from mature organizations
- Is this a miracle?
- Chaos engineering
- No free cycles to improve

Toil

Manual, repetitive, automatable, interrupt-driven and reactive work with no enduring value.

Unplanned Work

Work In Progress

Adopting a vision

- Business sponsors
- Invest in our platform
- Identified key enablers to reduce toil

Excitement

a feeling of great enthusiasm and eagerness

We set out to improve our tooling

- Introduce new bleeding-edge technologies
- Custom tools
- Many integrations and trials

Satisfaction

fulfillment of one's wishes, expectations, or needs, or the pleasure derived from this

Good is the enemy of great

- We did a lot of custom code and integrations
- We need to define internal standards
- We tried pretty much everything, all tools and solutions had their chance
- Definition of Done?

Increase in the number of tools...

- Too many tools and solutions
- We are not reducing complexity
- We now need operational knowledge of more tools!

Friction

- (Intrusive) code instrumentation multiple stacks
- Bumping heads with competing standards
- Change of mentality
- Change of habits

Fear

an unpleasant emotion caused by the belief that someone or something is dangerous, likely to cause pain, or a threat

Living in fear

- No adoption
- Are we covered?
- How’s ownership going?

Unknown unknowns

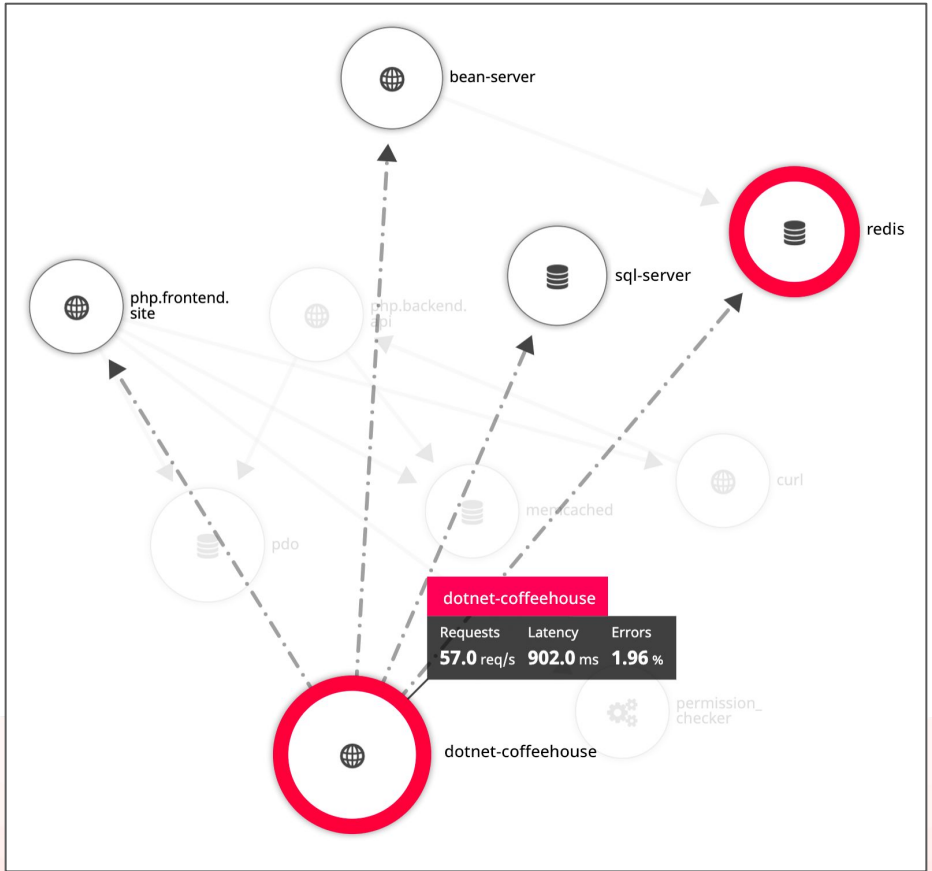
- Practice… practice… incident management & chaos engineering
- Distributed tracing data had a lot of potential, but we failed at extracting any value out of the data we collected


LEFT
EXIT 12
Grief
Iterate

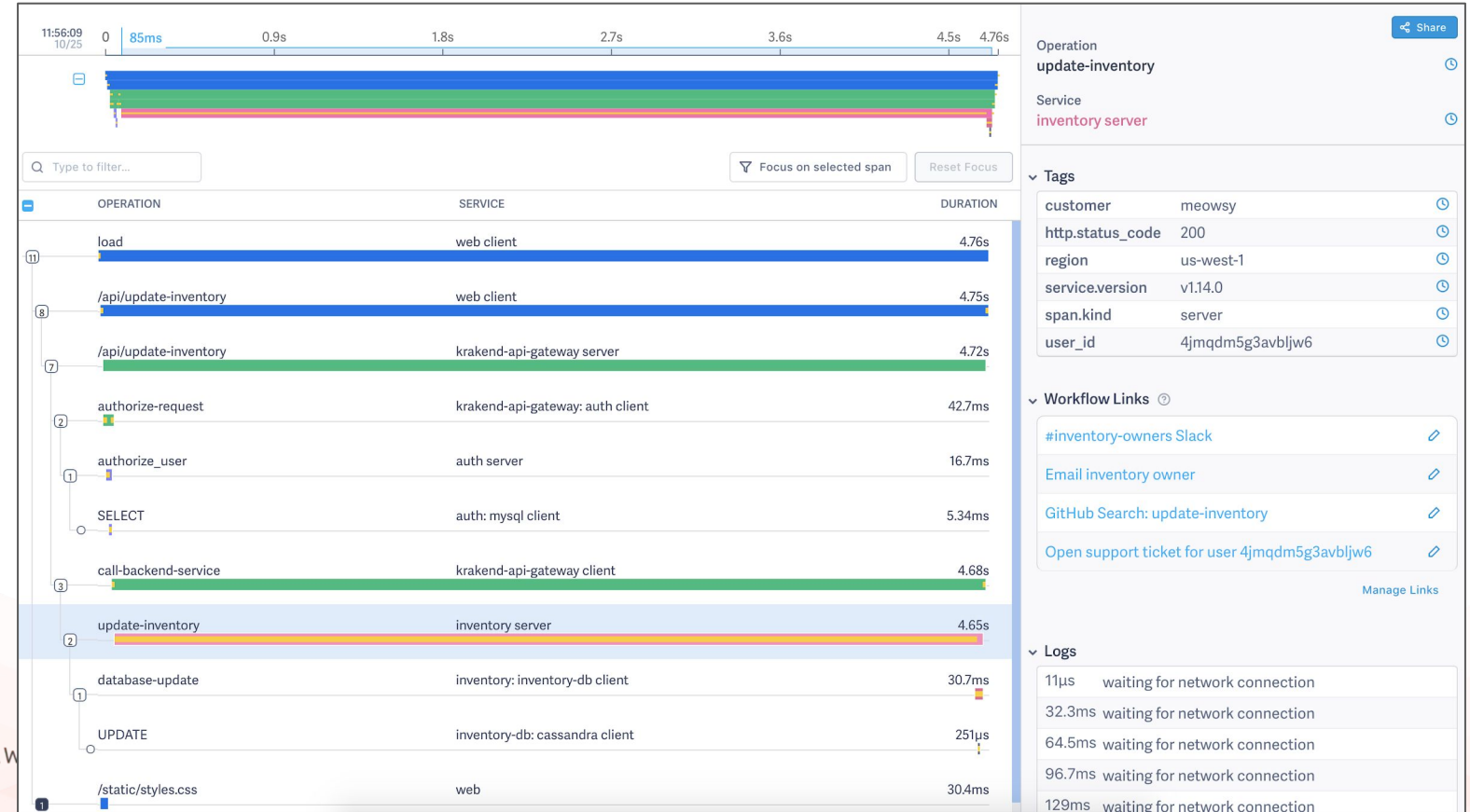
Double down on distributed tracing

- Vendor partnership
- Instrument our code
- Attach business metrics and logs to spans
- Collect the data
- Infer metrics from the collected data
- Render in a comprehensive single pane of glass
- No data retention; No sampling

Live service graph



Single trace view



Drill down analytics

Distributed traces

Helped define our SLIs

Visibility on our SLOs

Identify root-causes

Understand failure modes

Go-to dashboard


OpenTelemetry


W3C®
Trace Context

Growth

1. the process of developing or maturing physically, mentally, or spiritually

2. the process of increasing in amount, value, or importance

Addressing the problem

- Find, assign and route alert to owners
- Reduce the number of moving parts (environments)
- Start at the edge
- ~~“3 pillars”~~
- Aligned with business objectives
- The power of habits

Thanks!

Credits

[1] The Phoenix Project: A Novel About IT, DevOps, and Helping Your Business Win, Gene Kim, Kevin Behr, George Spafford, 2013

[2] https://medium.com/@copyconstruct/monitoring-and-observability-8417d1952e1c

[3] https://www.datadoghq.com/blog/monitoring-101-alerting/

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[6] https://imgix.datadoghq.com/img/blog/net-monitoring-apm/dotnet-monitoring-service-map-v3.png?fit=max

[7] https://vital-leaf.cloudvent.net/paths/gs-resolve-path/step-three

[8] https://github.com/honeycombio/examples/tree/master/kubernetes-envoy-tracing