

011y with Toli

101 - May 2022

What is observability?



011y with Toli

June

May 2022

cinch

o11y = Observability

o11y =

← **Charity Majors** ✓
56.9K Tweets



Charity Majors ✓
@mipsytipsy

cofounder/CTO @honeycombio, co-wrote Database Reliability Engineering, loves whiskey, rainbows, and Friday deploys. I test in production and so do you. 🌈

◎ San Francisco ⚡ charity.wtf 📅 Joined November 2009

... 📧 🔔 Following

Observability



March 3, 2020

mipsytipsy

[apm](#), [fight fight fight](#),
[instrumentation](#), [logs](#),
[metrics](#), [monitoring](#),
[traces](#)

OBSERVABILITY IS A MANY-SPLENDORED DEFINITION

Last weekend, [@swyx](#) posted a great little [primer](#) to instrumentation titled “Observability Tools in JavaScript”. A friend sent me the link and suggested that I might want to respond and clarify some things about observability, so I did, and we had a great conversation! Here is a lightly edited transcript of my [reply tweet storm](#).

First of all, confusion over terminology is understandable, because there are some big players out there actively trying to confuse you! Big Monitoring is indeed actively trying to define observability down to “metrics, logs and traces”. I guess they have been paying attention to the interest heating up around observability, and well... they have metrics, logs, and tracing tools to sell? So they have hopped on the bandwagon with some undeniable zeal.

But metrics, logs and traces are just data types. Which actually has nothing to do with observability. Let me explain the difference, and why I think you should care about this.

“OBSERVABILITY? I DO NOT THINK IT MEANS WHAT YOU THINK IT MEANS.”



Observability is a borrowed term from mechanical engineering/control theory. It means, paraphrasing: “can you understand what is happening inside the system — can you understand ANY internal state the system may get itself into, simply by asking questions from the outside?” We can apply this concept to software in interesting ways, and we may end up using some data types, but that’s putting the cart before the horse.

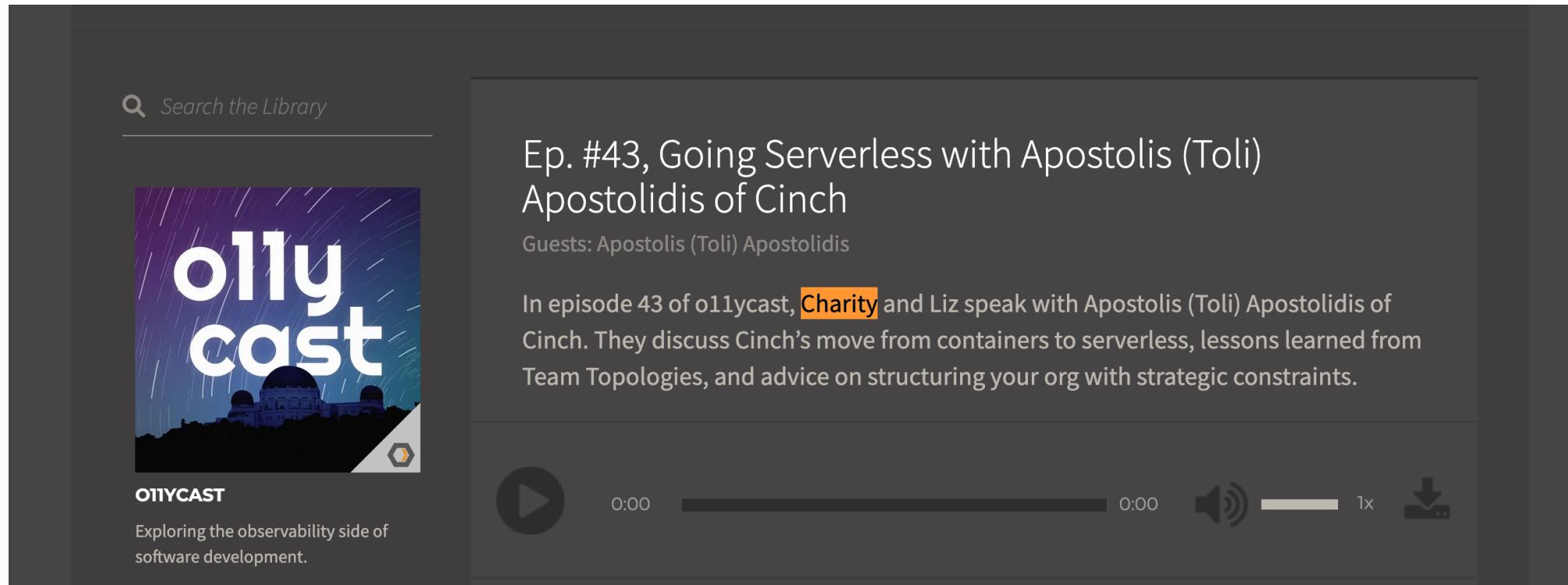
It’s a bit like saying that “database replication means structs, longints and elegantly diagrammed English sentences.” Er, no.. yes.. missing the point much?

That's it. Go and read
Charity's rants.

(I read all her rants)

(and her blog posts)

I even chatted to her about o11y @ cinch.



Why should care about
o11y?

Build it, Ship it, Support it

Build it, Ship it, Support it!



DevOps Maturity

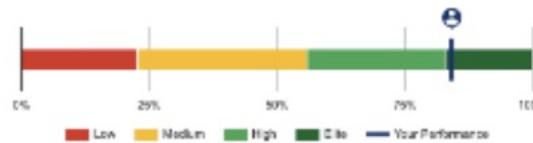
DevOps maturity is... Elite!

Your software delivery performance

Your performance:

Elite

You're performing better than 84% of State of DevOps Survey respondents. 



Share results

Start over

IMPROVEMENT AREAS

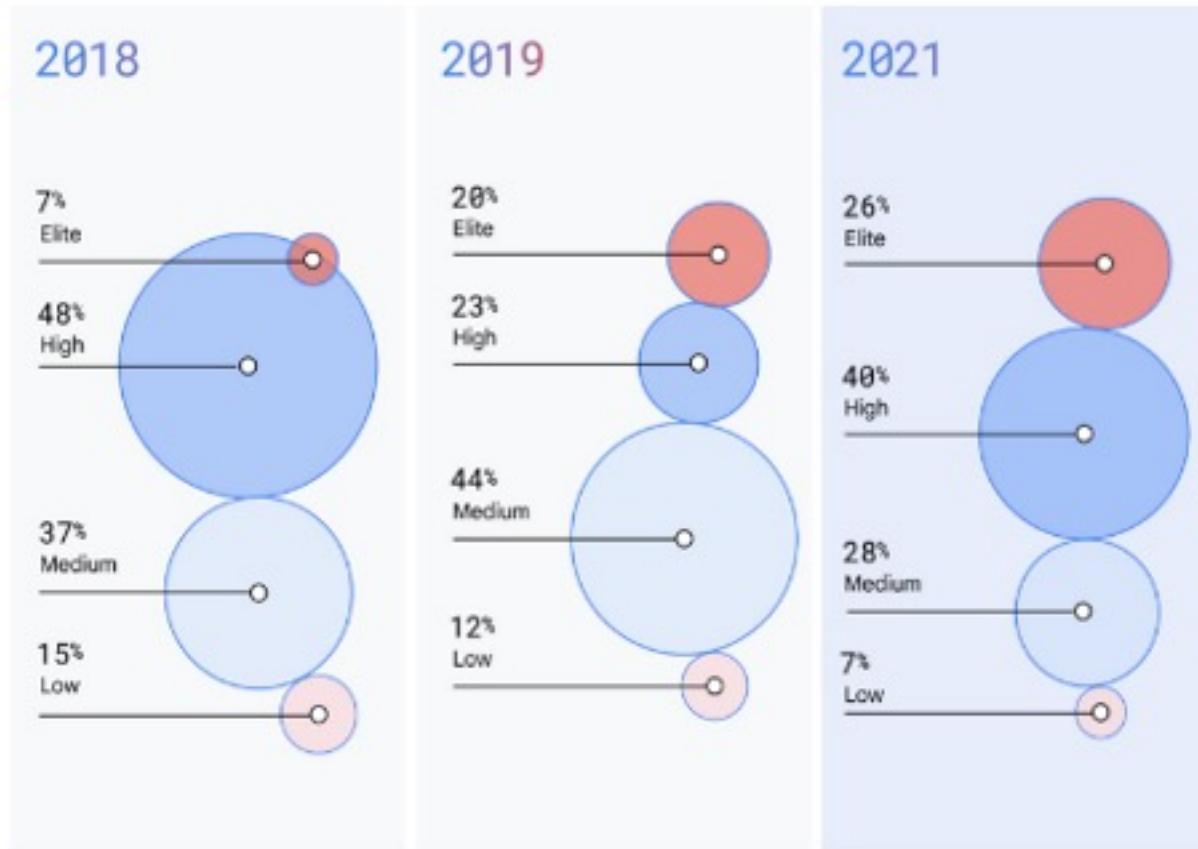
PERFORMANCE COMPARISON

ELITE PREDICTION

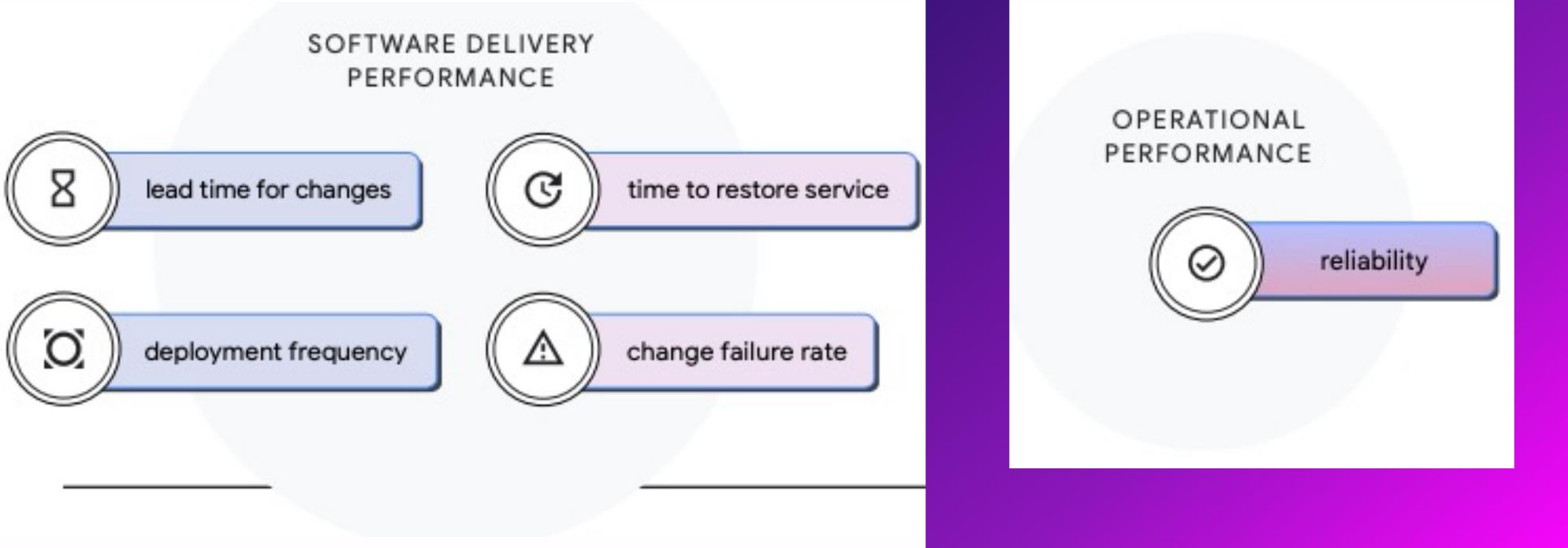
cinch | Checkout Squad

cinch

The industry has advanced



The fifth metric: Reliability*



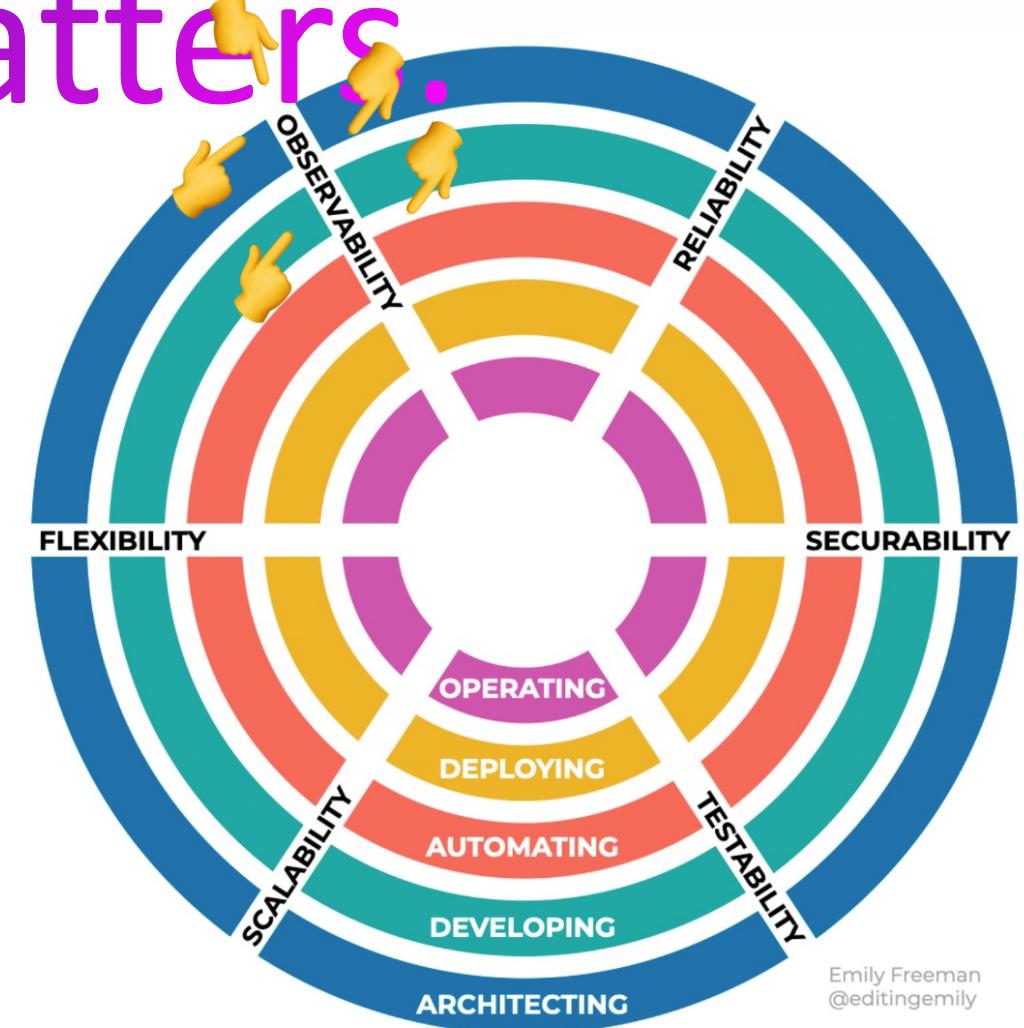
* 2021 Accelerate State of DevOps Report

Reliability = serverless + o11y*

*observability



Observability matters.



Emily Freeman
@editingemily

“How do you know your
change is working in
production?”

Software that can't be
observed, can't be
improved.

Isn't only logs and alerts?

Isn't only logs and alerts?



Isn't only logs and alerts?



Isn't only logs and alerts?



What are logs?

Logs* record events taking place
in the execution of a system in
order to provide an audit trail...

*[https://en.wikipedia.org/wiki/Logging_\(software\)](https://en.wikipedia.org/wiki/Logging_(software))

...that can be used to understand
the activity of the system and to
diagnose problems*

*[https://en.wikipedia.org/wiki/Logging_\(software\)](https://en.wikipedia.org/wiki/Logging_(software))

“Logs are the problem
child of observability”

What are alerts?

Alerts* help us to identify ongoing or upcoming issues that we may get within our ~~data center~~ software systems...

*<https://social.technet.microsoft.com/wiki/contents/articles/53579.scom-alert-basics.aspx>

...It is important to fully understand the meaning of the alert(s) that we receive before taking any action

*<https://social.technet.microsoft.com/wiki/contents/articles/53579.scom-alert-basics.aspx>

What is observability?

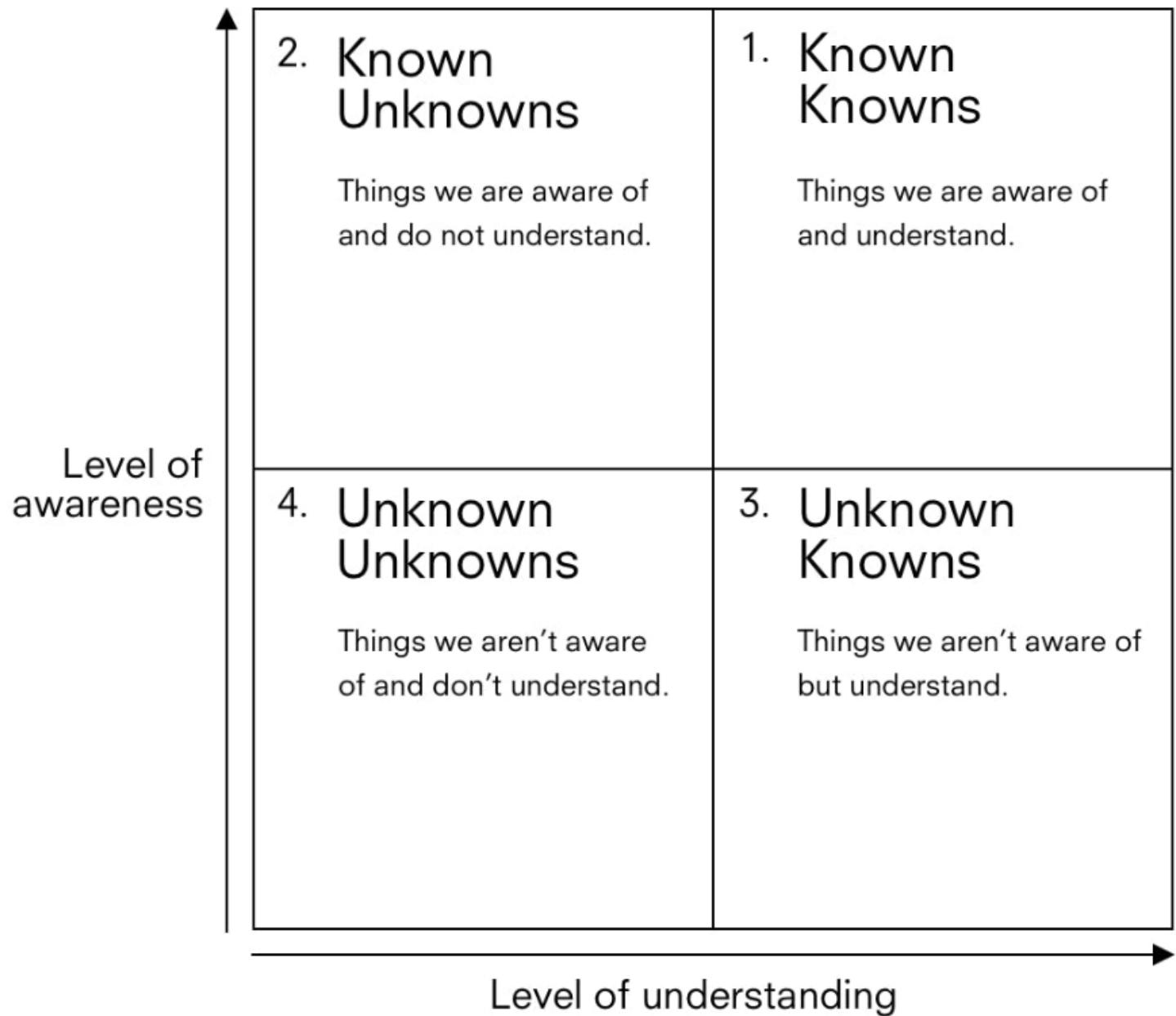
Observability is the ability to understand how a software system is behaving internally by evaluating its outputs.

O11y is a fancy word for
“testing in production”

“011y is about
understanding the health of
the customer transactions”

Observability is a state of
the system.

Charity Majors ~~coined~~
borrowed the term for
Software.

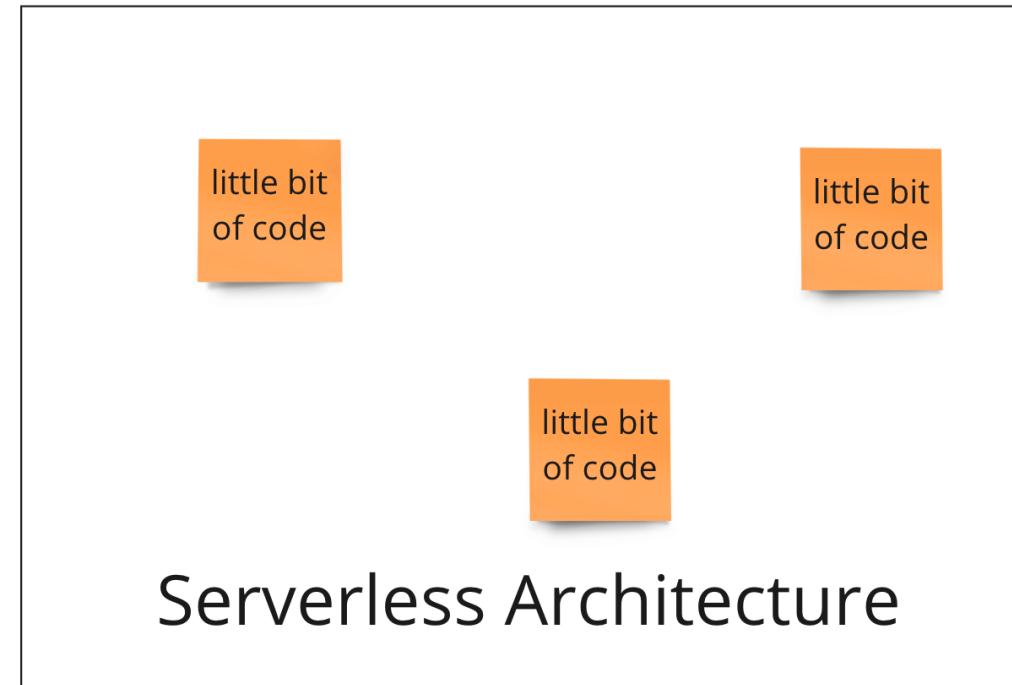


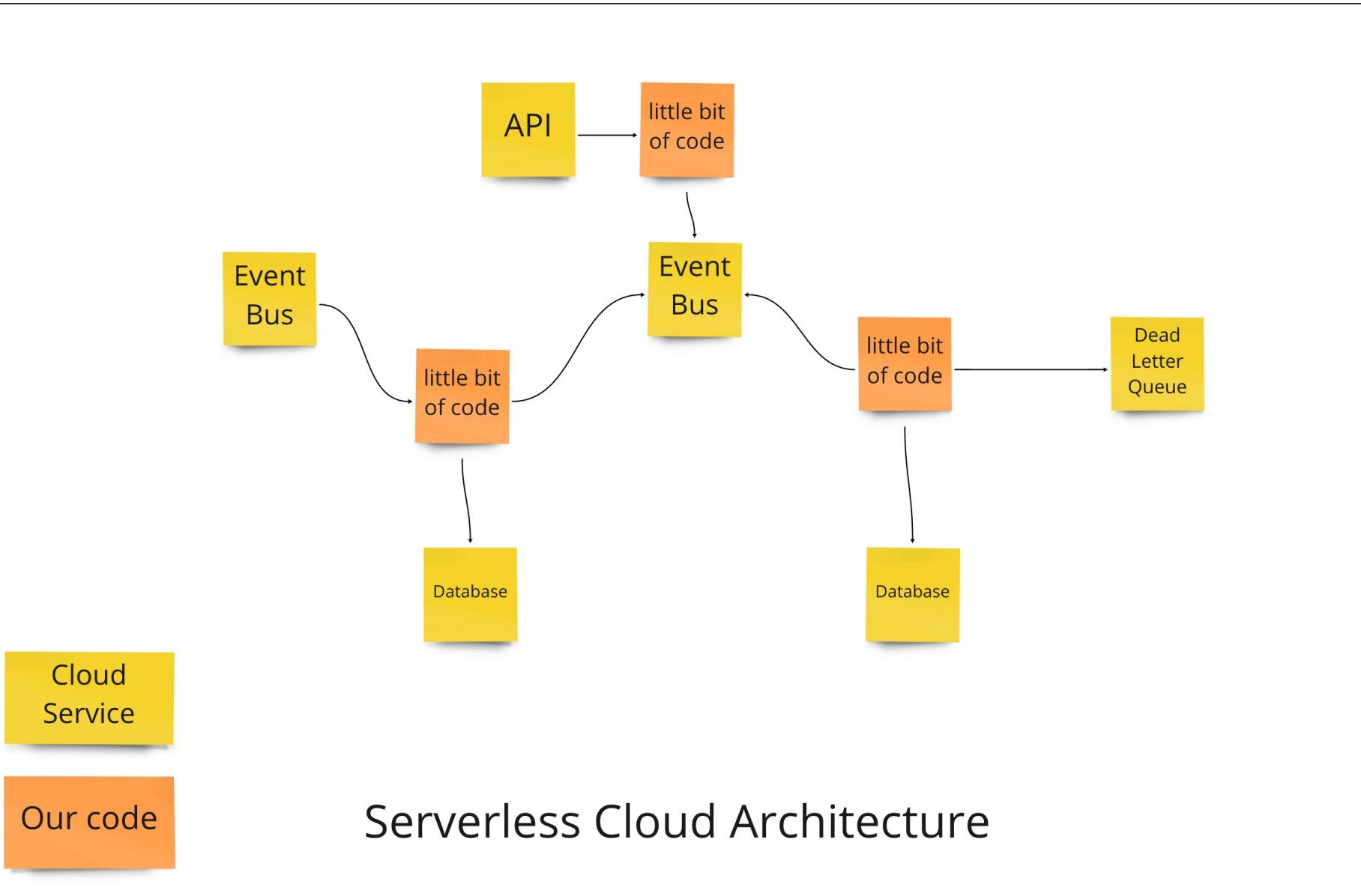
OK, how do I make systems
observable?

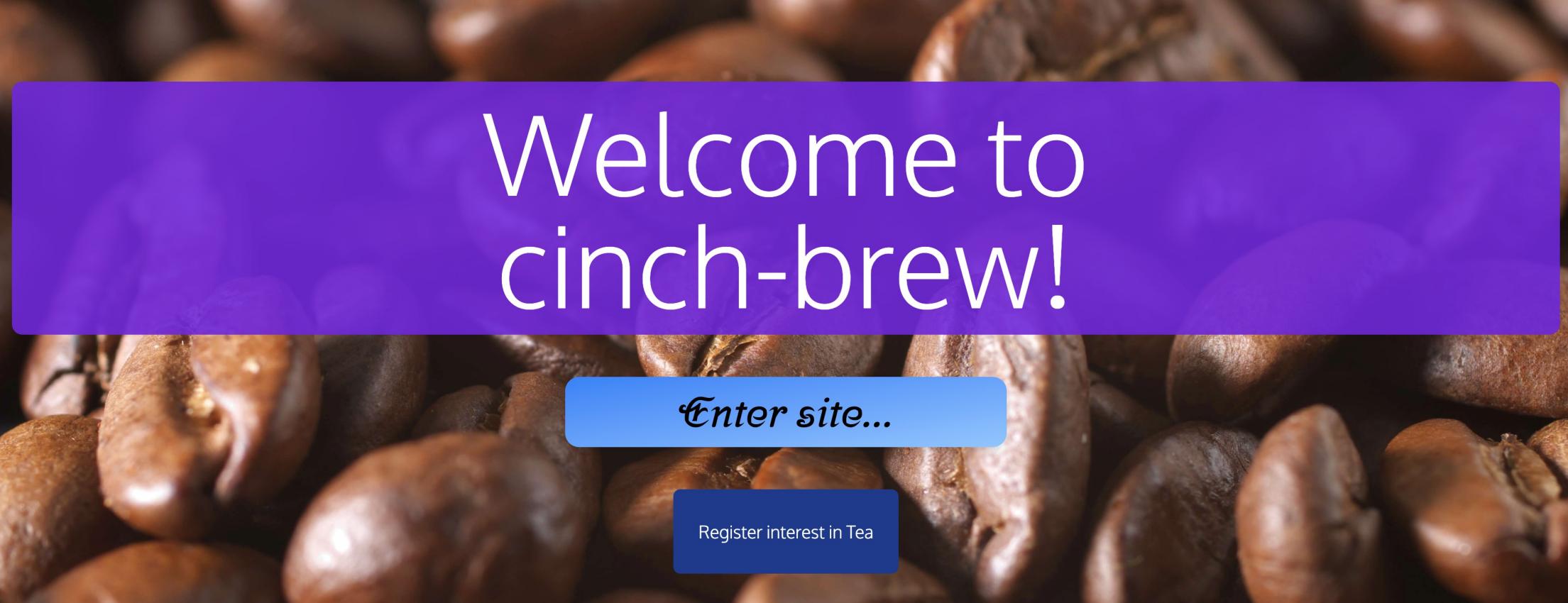
Making systems
observable doesn't happen
by accident

Distributed systems make
things a lot harder

Little bits of code here & there



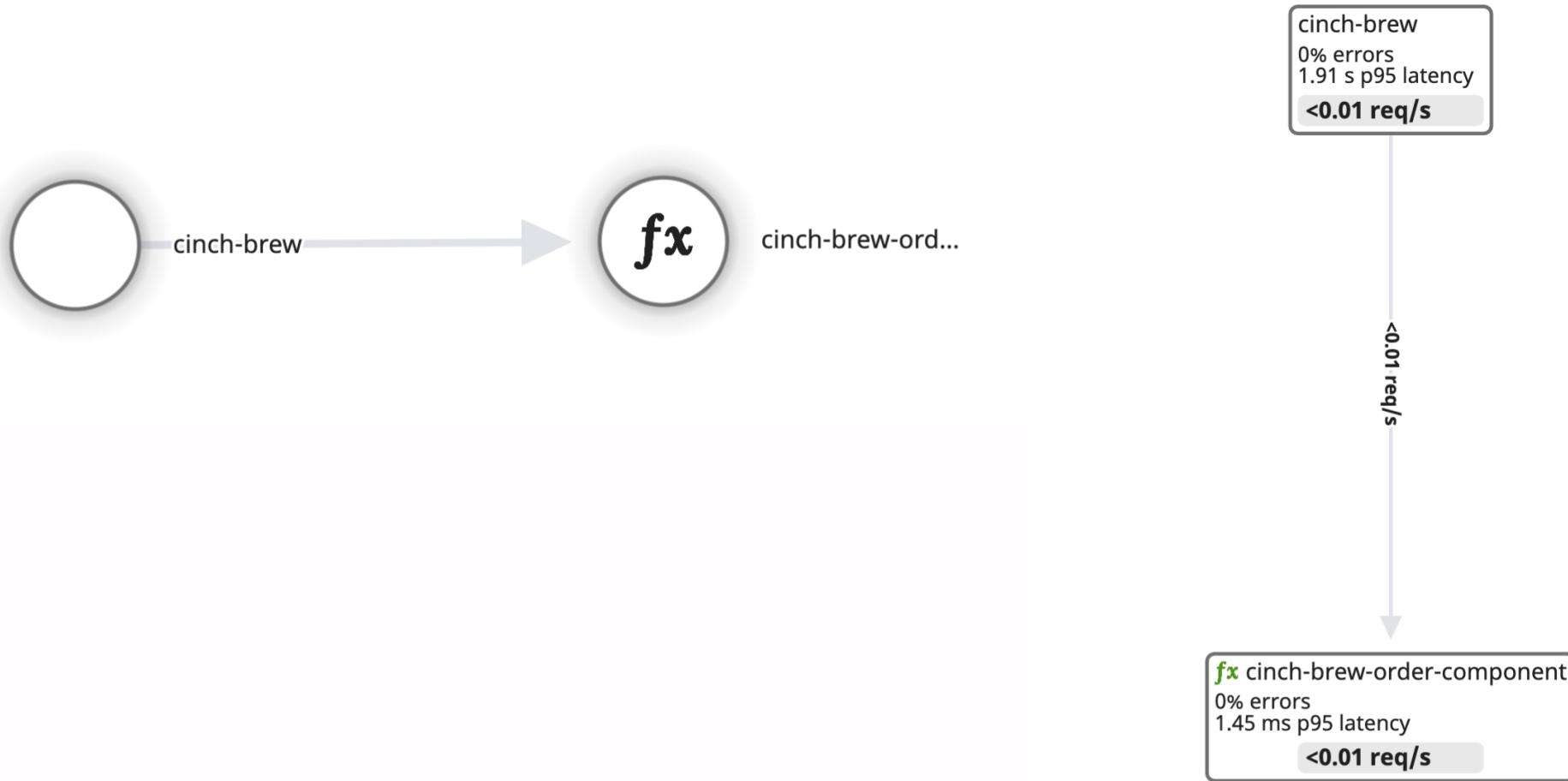


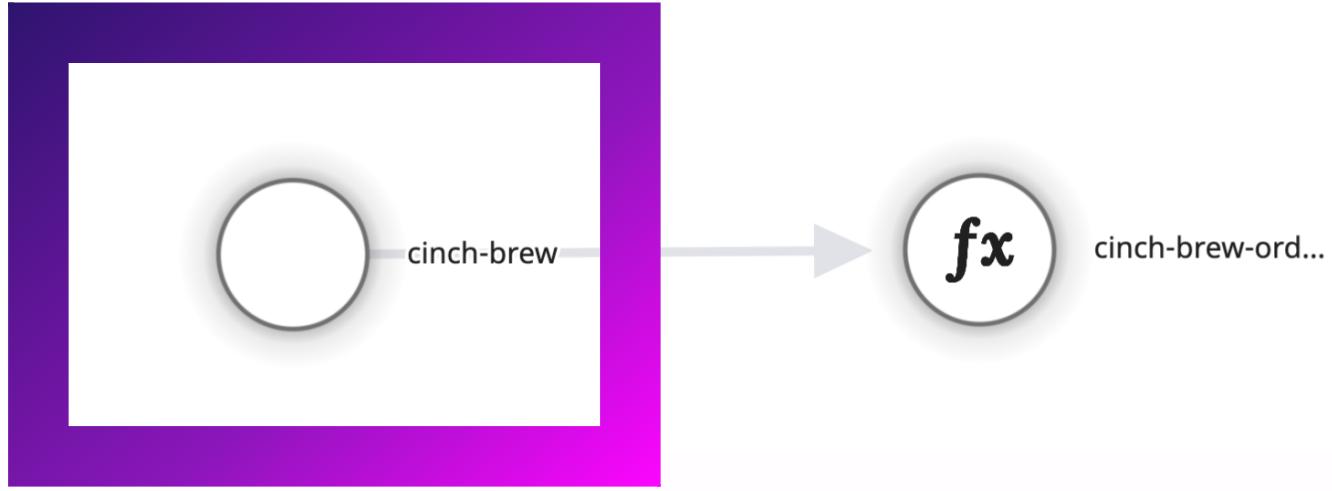


Welcome to
cinch-brew!

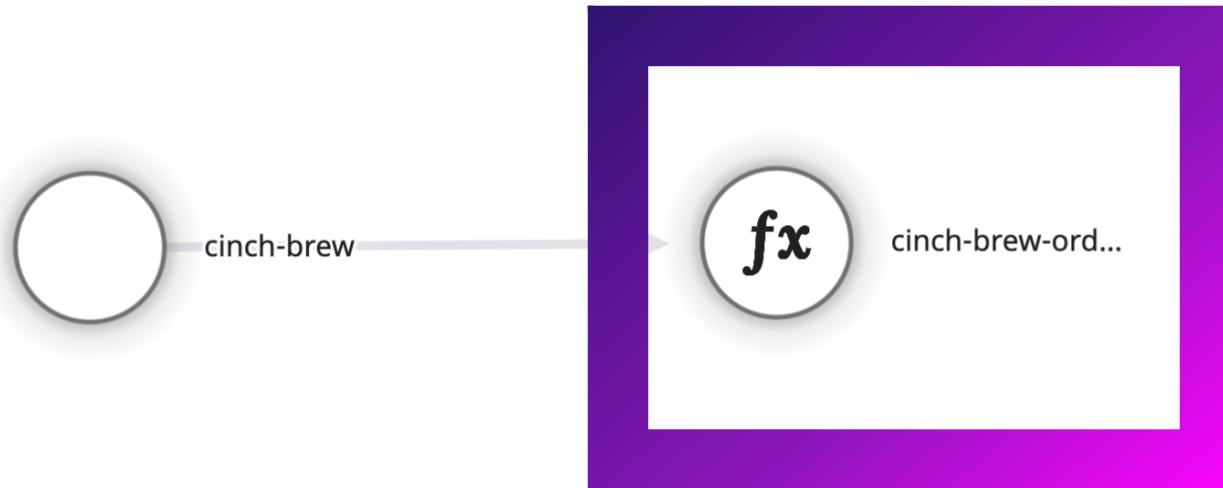
Enter site...

Register interest in Tea





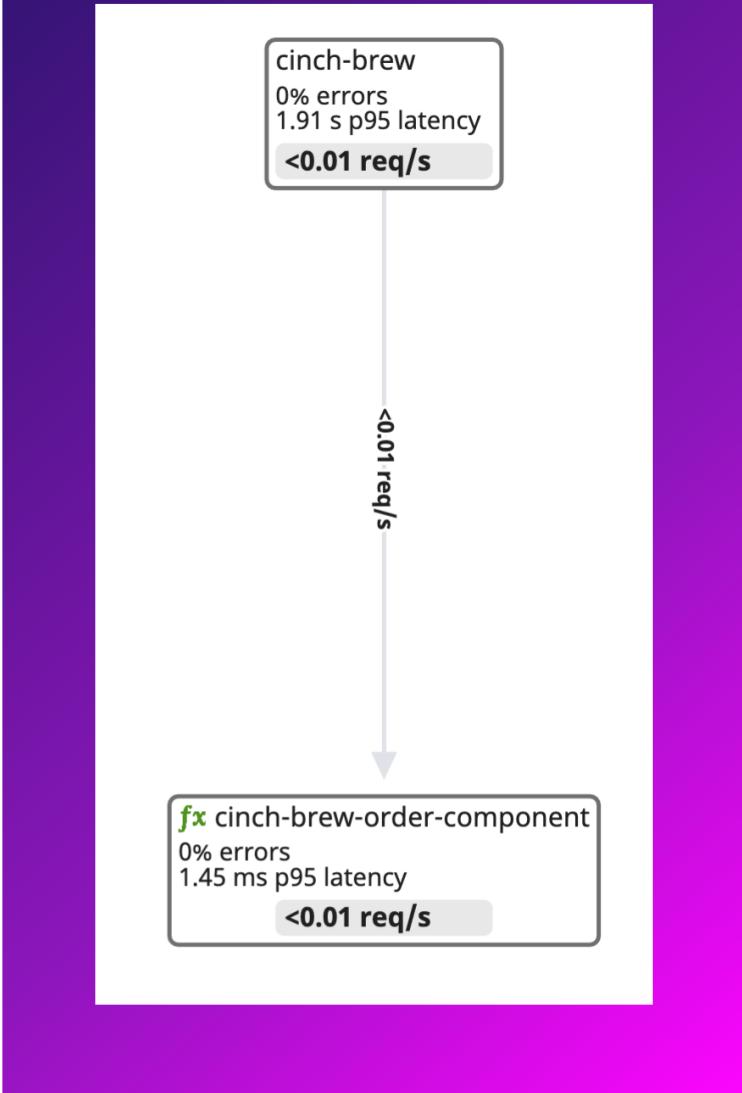
Frontend



Backend

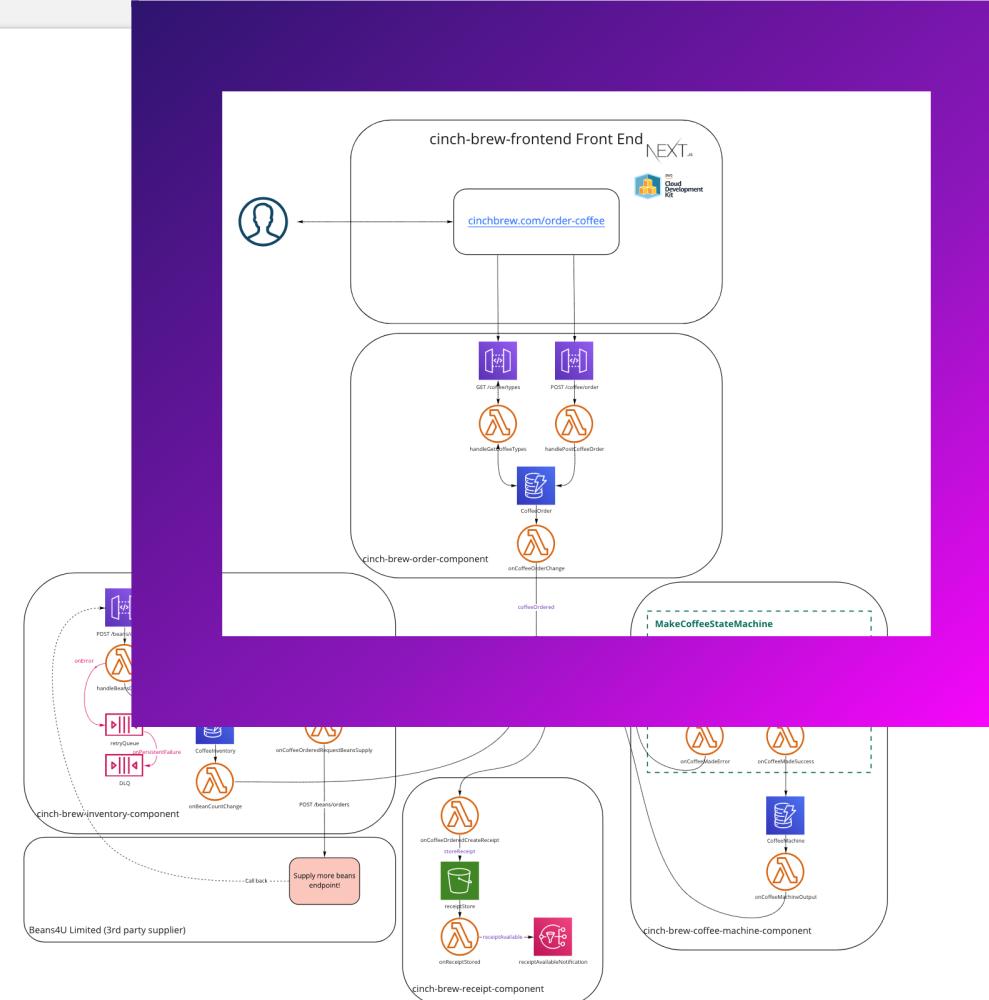


cinch-brew-ord...



Requests, Errors, Duration

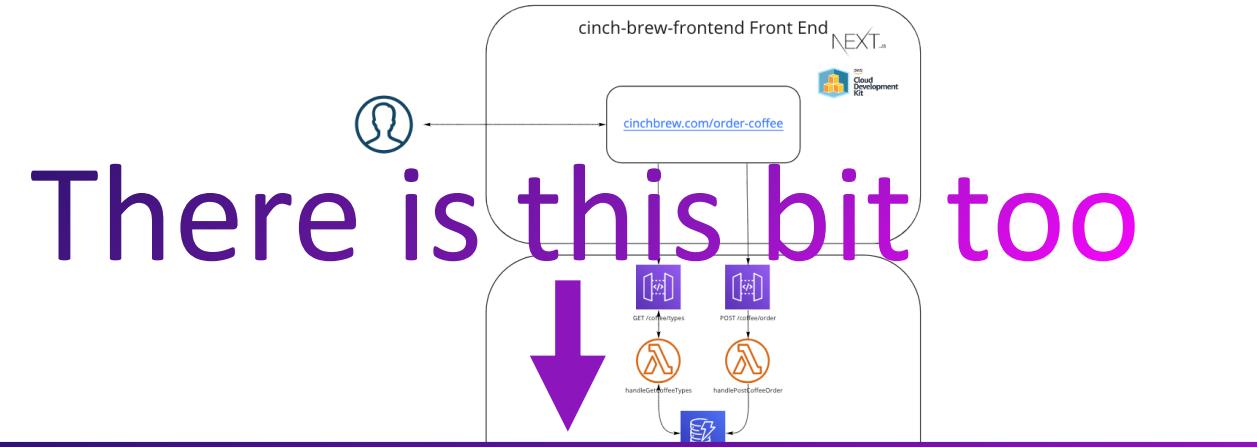
- Legend**
- API Gateway
 - Lambda function
 - DynamoDB table
 - SNS topic
 - S3 bucket
 - EventBridge event bus
 - SQS



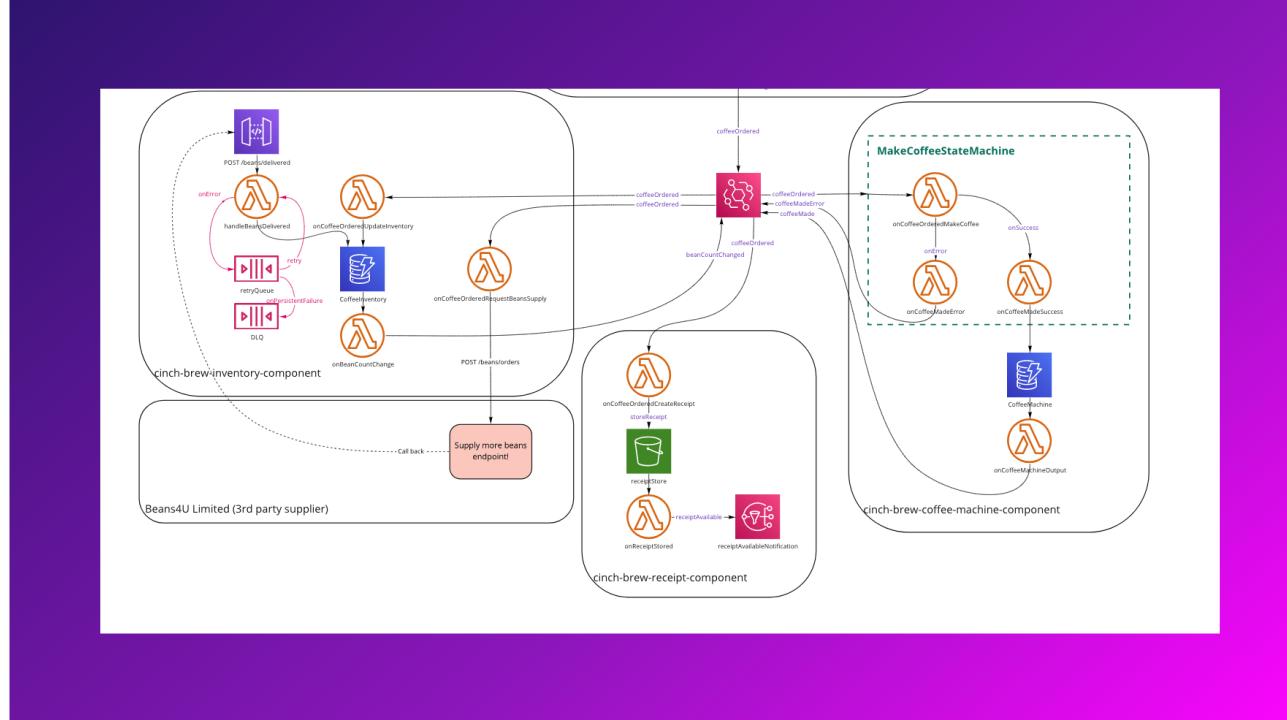
In (our fictitious) reality, systems are more complex

Legend

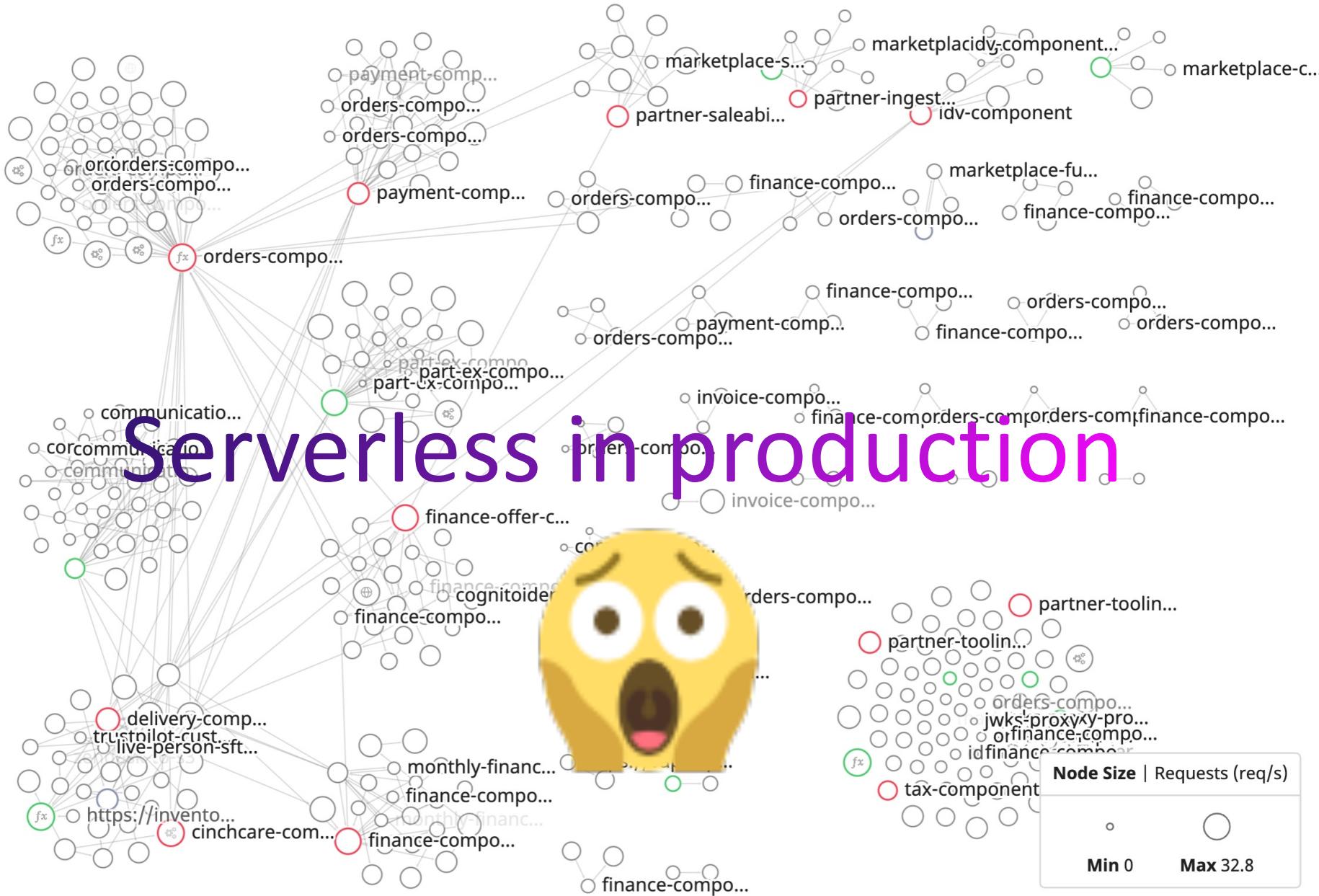
-  API Gateway
 -  Lambda function
 -  DynamoDB table
 -  SNS topic
 -  S3 bucket
 -  EventBridge event bus
 -  SQS



There is this bit too



Serverless in production



Can you see the complexity creeping
in?



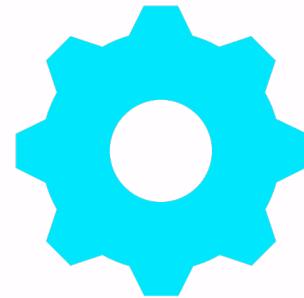
OK, how do I make systems
observable?

You start with code
instrumentation

Instrumentation is the practice
of systematically configuring
our codebase to emit
telemetry data...

...that provide insights into how
our code is exercised by data in
production

Instrument, don't log



Auto-instrumentation



Custom instrumentation

Traces

Metrics

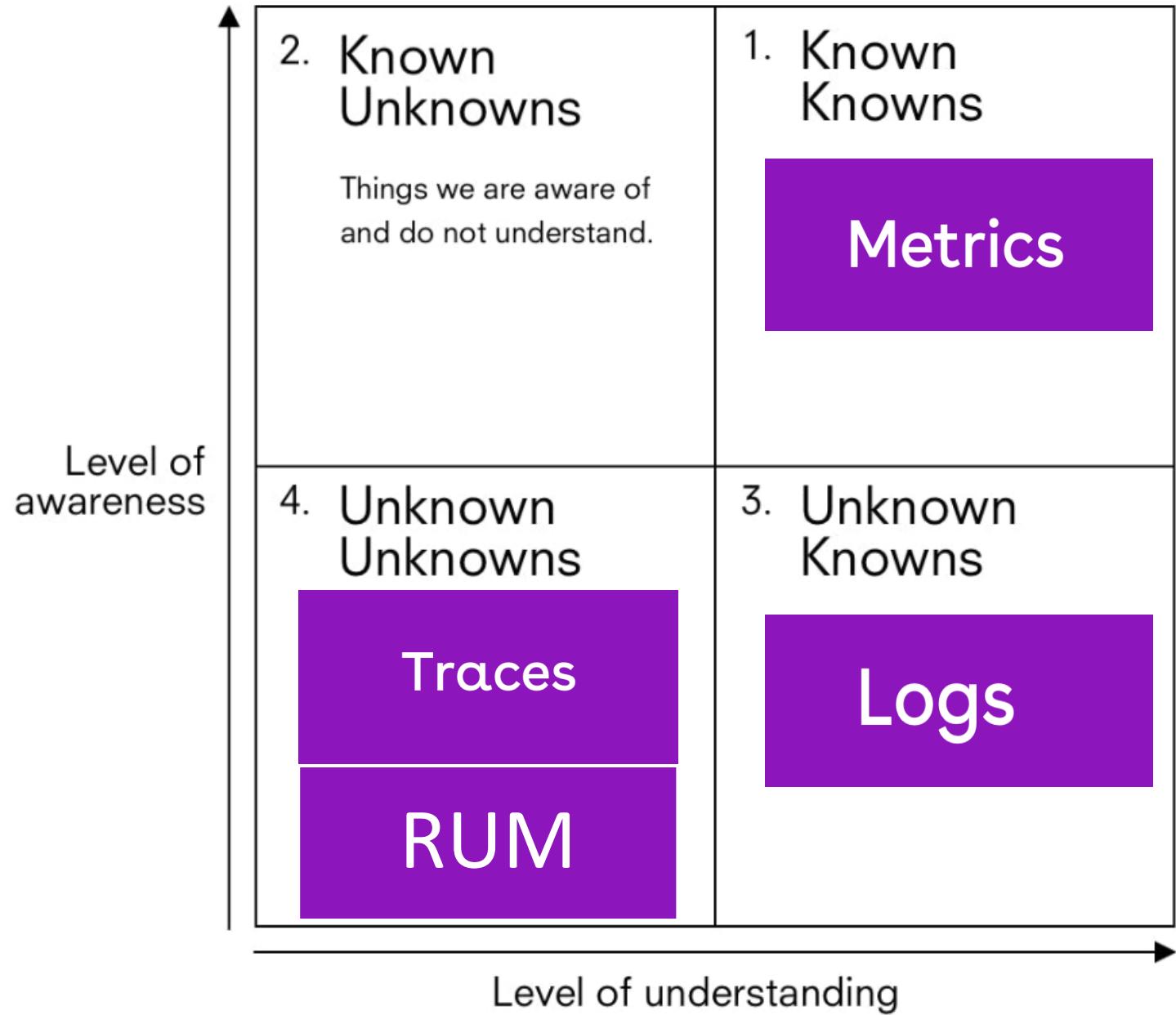
Logs

RUM

Events

CI
Pipelines

CI Tests



OK, so now I have loads of
telemetry

How do I observe my systems

Orders Squad - Motherboard + Add Widgets Cmd + E

1h Past 1 Hour || ◀ ▶ 🔍 ⚙️

Search... Saved Views \$aws_account aws-production-prod \$env prod \$aws_account_id 956165690157 \$environment production 🔗

Are orders looking healthy? 23 widgets

Is our part exchange service healthy? 12 widgets

What changes have been released? 6 widgets

Real User Monitoring + Save 1h Past 1 Hour ◀ ▶ 🔍 Learn More

Applications Sessions & Replays Dashboards Generate Metrics **BETA**

In Sessions Q Filter your rum events Or Q Filter your rum events x Export

Sessions 6.68K Split into fields: Show Count of all sessions by Browser Name X limit to top 10 + roll up every 60s (auto)

Views 32.9K Alize as: List Timeseries Top List Table Distribution Geomap Funnel

Actions 75.6K Hide Controls

Errors 347K LIVE Past 15 Minutes Pause 🔍 Q

Display: Bars Color: Classic

APM Services Traces Profiles

Views **Live Search All Ingested Data** + Save

Search for Q Env:(2 terms) X

Visualize as: List Timeseries Top List Table Flow Map

Requests 231k total (257 req/s)

Errors 2.16k total (0.93%)

Latency

Service Entry Spans

Hide Graphs

Watchdog Insights Latency outliers View all

CORE

Duration Min 0ns Max 15.2min

Status Ok 229k Error 2.19k

DATE	SERVICE	RESOURCE	DURAT...	METHOD	STATUS CODE
May 16 19:30:56.513	fx service-history-comp...	service-history-component-GetBasicSH_pr...	21.1 ms	GET	200
May 16 19:30:56.512	⊕ service-history-comp...	POST	19.6 ms	POST	200
May 16 19:30:56.486	⊕ search.api.cinch.co...	GET /alternative-vehicles	997 µs	GET	200
May 16 19:30:56.461	⊕ search.api.cinch.co...	GET /alternative-vehicles	2.00 ms	GET	200
May 16 19:30:56.386	fx search-component	sc-alt-vehicles-prod	226 µs	GET	200
May 16 19:30:56.299	fx search-component	sc-vehicles-get-lambda-prod	104 ms	GET	200
May 16 19:30:56.289	⊕ search-component-htt...	POST	87.4 ms	POST	200

Edge Electron Facebook Google Mobile Safari Safari Samsung Internet

cinch

Inclusive

★ Orders Squad - Motherboard ▾ [+ Add Widgets Cmd + E](#) 1h Past 1 Hour

Search... Saved Views \$aws_account [REDACTED] \$env prod \$aws_account_id [REDACTED]
\$environment production

The dashboard displays six cards, each with a question and the number of widgets it contains:

- Are orders looking healthy? (23 widgets)
- Is our part exchange service healthy? (12 widgets)
- What changes have been released? (6 widgets)
- Do we have any incidents? (1 widget)
- Are we seeing errors? (5 widgets)
- Are my APIs healthy? (12 widgets)

Comprehensive

★ 🔎 Search Squad Standup Board ▾ [+ Add Widgets Cmd+E](#) 1d Past 1 Day ⏪ ⏴ ⏵ ⏵

🔍 Search... Saved Views \$env prod \$no-version-conflict version_conflict_engine_exception

Search squads Links

Jira 📈	Repos 🚀	Miro 🎨	Dashboards	Docs 📄	AWS 🌐
APM - Search ✅	APM - Rec ✅	CloudTrail	RUM 🚧	Sonar 🤔	Logs 🌱
Event More ▾					

Health at a Glance

Monitor statuses

STATUS	MONITOR NAME	TRIGGERED
OK	Prod - Someone has messed with s...	4h
OK	Prod - Vehicles get lambda duratio...	1w
OK	Prod - API Gateway Logs are no lon...	1w
OK	[Synthetics] Search API - Ford Fiesta	1w

Alerted monitors

No matching entries found

Learn more about events query syntax

LCP average

Unique user crashes

Count	Description
39.00	console error: T...
35.00	console error: p...
11.00	console error: ...
8.00	console error: ...
5.00	console error: T...
2.00	console error: E...
2.00	console error: T...
1.00	console error: F...

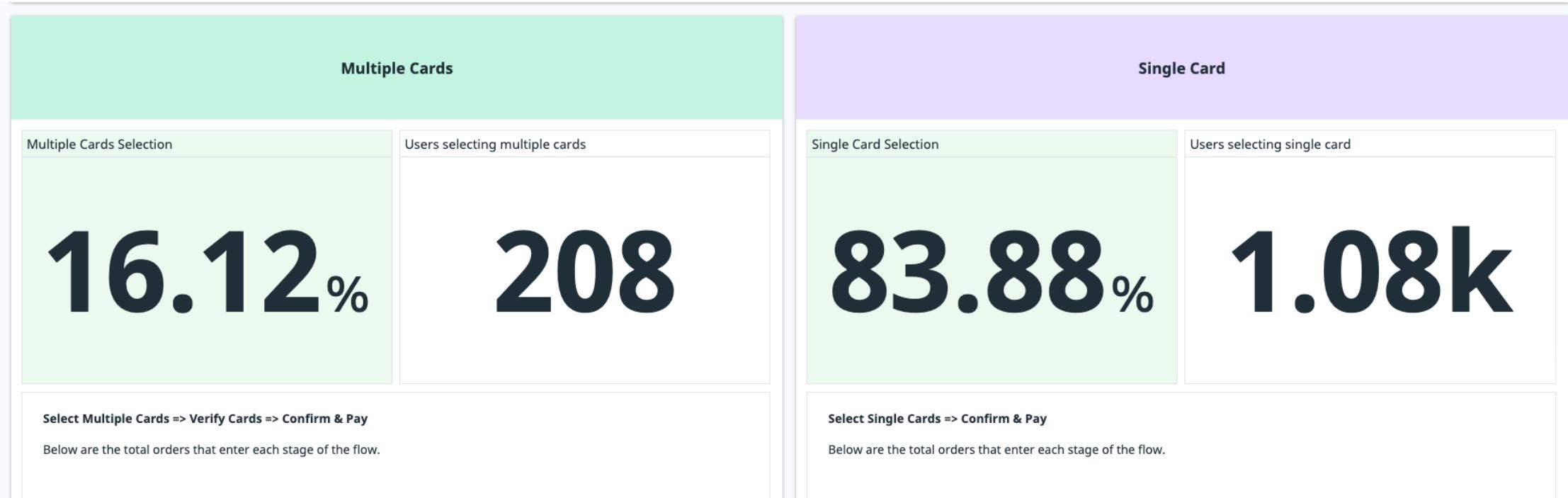
Unique user crashes ...

Unique user crashes

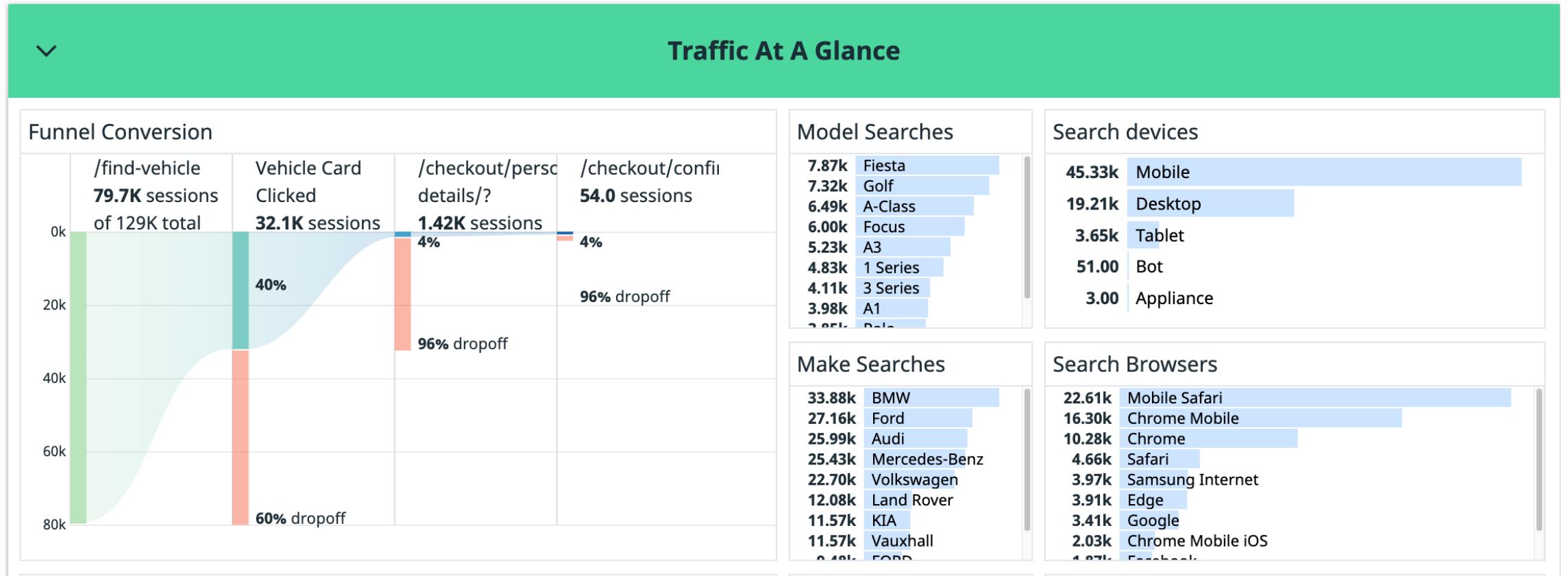
32

This image shows a screenshot of a monitoring dashboard titled "Squad Standup Board". The top navigation bar includes search, saved views, and filter options for time periods and specific event types. Below the navigation is a grid of links to various tools: Jira, Repos, Miro, Dashboards, Docs, AWS, APM - Search, APM - Rec, CloudTrail, RUM, Sonar, and Logs. A "Search squads Links" section is also present. The main content area is titled "Health at a Glance" and contains several widgets: "Monitor statuses" showing 35 OK monitors; "Alerted monitors" showing none; "LCP average" with a histogram; "Unique user crashes" with a list of errors and their counts; and another "Unique user crashes" section with a line chart. The overall interface is clean and organized, designed for quick status updates.

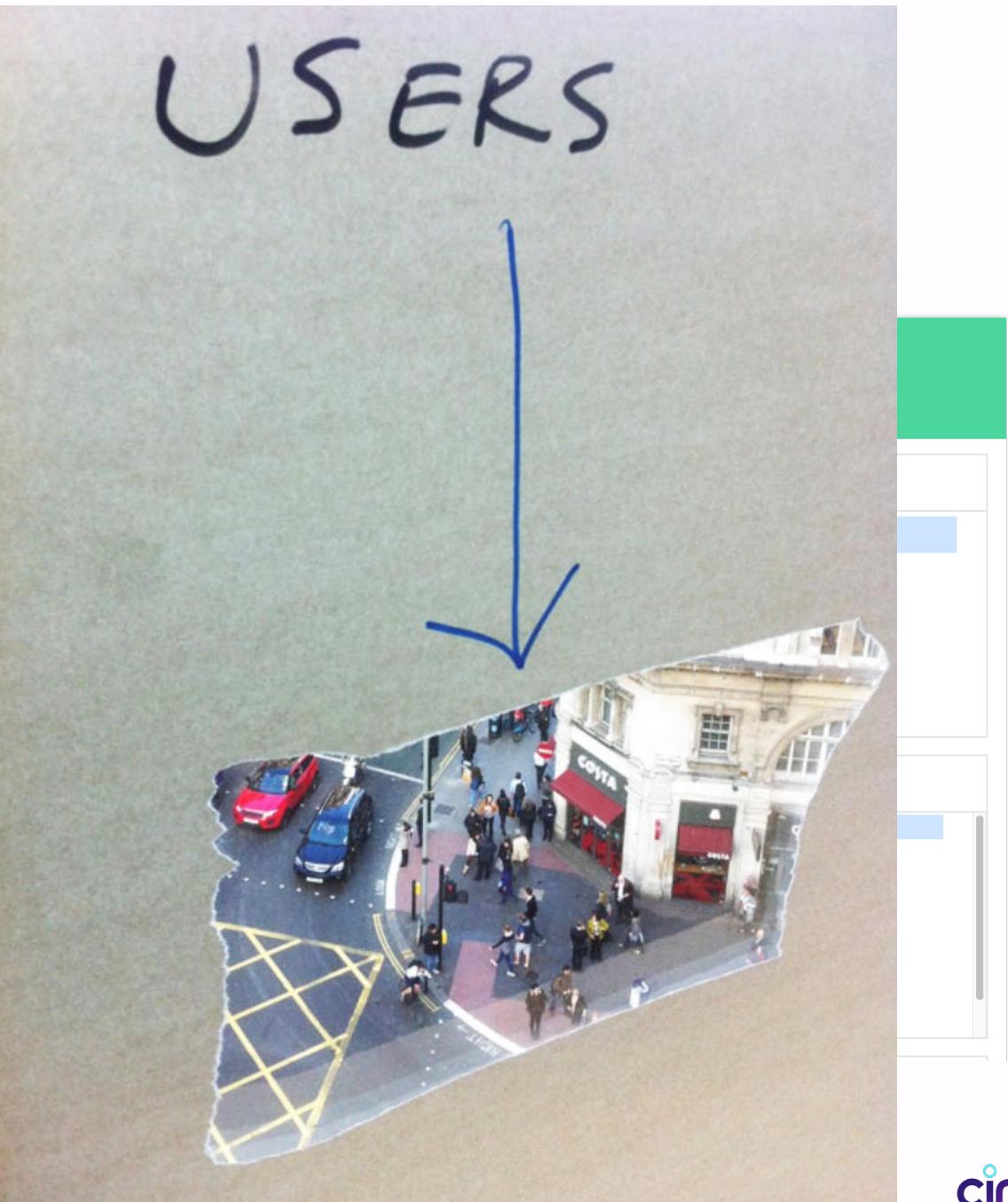
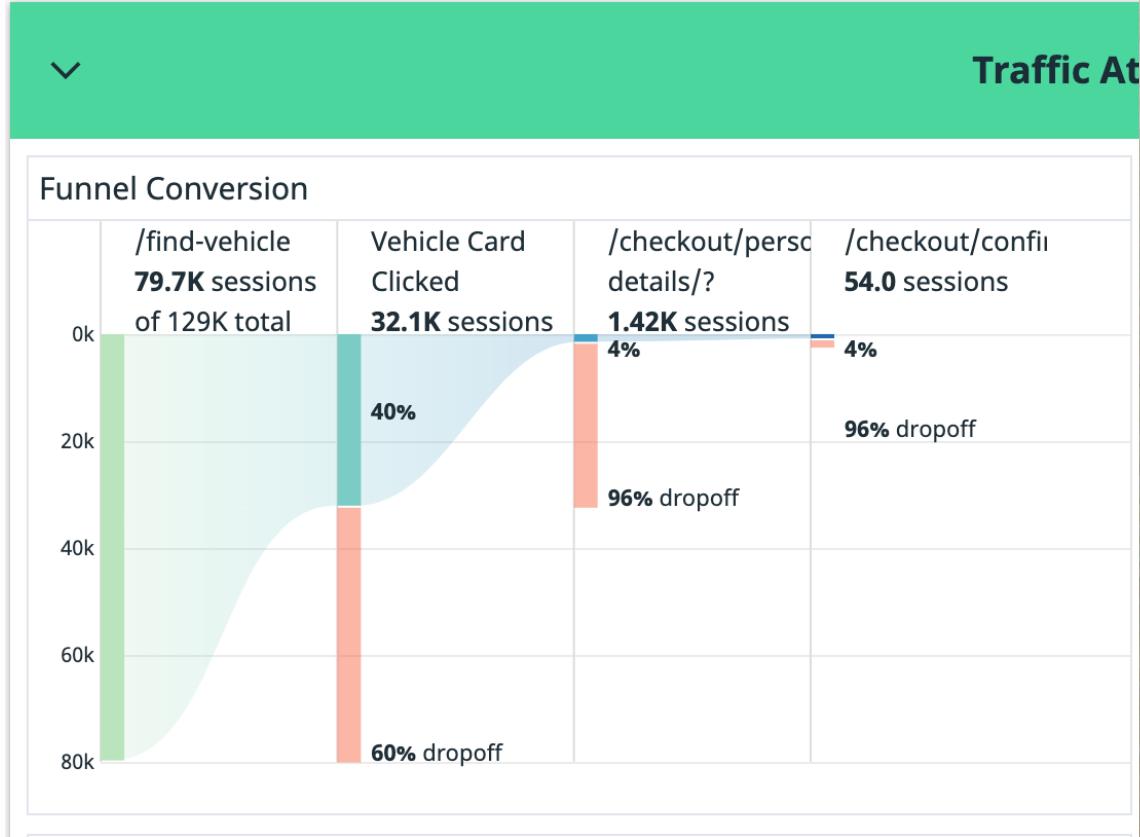
Customer centric



Funnel



Funnel



There's a workshop!

 Notebooks > <Team Name> ⚡ O11y Workshop: Browsing ...  

<Team Name> ⚡ O11y Workshop: Browsing the Datadog UI

 Created by Toli on Apr 7
Last updated about 1 month ago

<Team Name> ⚡ O11y Workshop: Browsing the Datadog UI

- Introduction
- Workshop Session Schedule
- Team Name
- 🎯 Challenges 🎯
- Challenge # 0: Warm up - Personalise your Datadog UI
- Challenge # 1: Where are my squad's dashboards?
- Answer
- Challenge # 2: How many deployments has my squad made in the last month?
- Answer
- Challenge # 3: How many monitors have been in alert in the last week in your squad?
- Answer
- Challenge # 4: Metrics - How is the service performing?
- Answer
- Challenge # 5: Logs - Find out the what and the why behind your error
- Answer
- Challenge # 6: APM - Find out more about your service's errors
- Answer
- Challenge # 7: Real User Monitoring (RUM) - How is your squad's main frontend page performing?
- Challenge # 8: Synthetics - Create & monitor a browser synthetic
- Answer

UI and understand the various monitoring platform.

rence.

Let's go through our various challenges, navigating around the various products. This is designed to be collaborative and a result of team work. You will be awarded points for every correct answer. So please read the challenges carefully (don't miss the hints), and record your answers!

<https://www.datadoghq.com/technical-enablement/>

Datadog workshops

The screenshot shows the Datadog Sessions page. At the top, there's a navigation bar with the Datadog logo, 'HOME', 'SESSIONS' (which is underlined), and 'SIGN UP'. Below the header, a large purple banner on the left says 'Sessions'. In the center, it says 'View our upcoming Foundation Enablement sessions below.' On the right, there's a search bar with icons for magnifying glass and calendar, and dropdown menus for 'TOPICS', 'LEVEL', 'LANGUAGE', and 'REGION'. Below the search bar, there are two workshop cards. The first card, 'Dashboarding (EMEA)', has tags 'DASHBOARDING', 'BEGINNER', 'ENGLISH', and 'EMEA'. It describes understanding how to build a dashboard and visualize data using Datadog dashboards, with '2 SESSIONS AVAILABLE'. The second card, 'Real User Monitoring with Datadog Intermediate(AMER)', has tags 'RUM', 'INTERMEDIATE', 'ENGLISH', and 'AMER'. It describes understanding how to proactively monitor front-end performance and user digital experience, with '1 SESSION AVAILABLE'.

The screenshot shows the 'Foundation Enablement Sessions' page. At the top, there's a navigation bar with the Datadog logo, 'HOME', 'SESSIONS' (underlined), and 'SIGN UP'. Below the header, a large purple banner on the left says 'Foundation Enablement Sessions'. In the center, it says 'Upcoming Sessions'. There are four session cards arranged in a grid. The first card, 'Intermediate APM (AMER)', has a '1 SESSION AVAILABLE' badge and a purple arrow icon. The second card, 'APM (AMER)', has a '2 SESSIONS AVAILABLE' badge and a purple arrow icon. The third card, 'Cloud Security Monitoring with Datadog (AMER)', describes understanding operational and security logs in real time. The fourth card, 'Custom Metrics (AMER)', describes defining custom metrics and applying tag values. Each card has a purple arrow icon at the bottom right.



Glossary

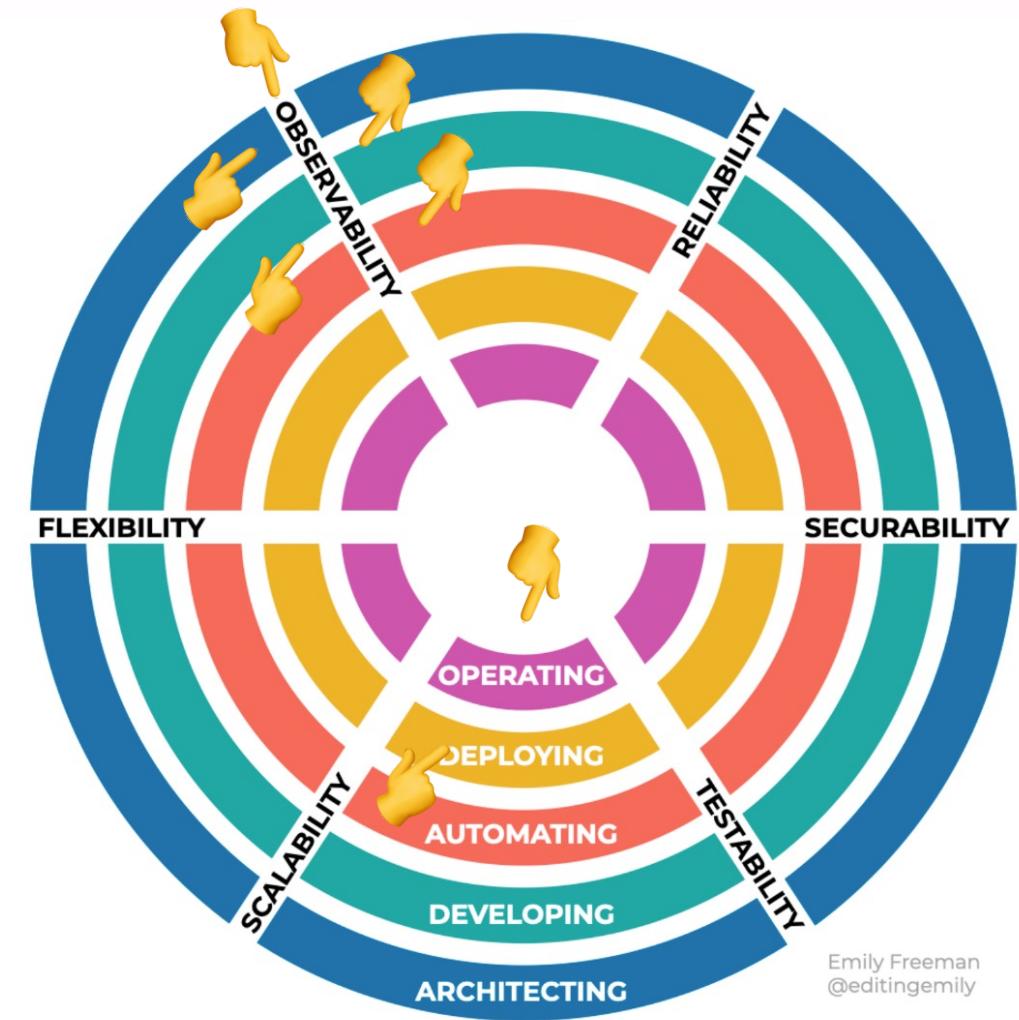
- [Glossary](#)
 - [Tracing and Spans](#)

Tracing and Spans

- **Trace** - A trace is used to track the time spent by an application processing a request and the status of this request. Each trace consists of one or more spans.
- **Trace Root Span** - A span is the root span when it is the entrypoint method for the trace. Its start marks the beginning of the trace
- **Service Entry Span** - A span is a service entry span when it is the entrypoint method for a request to a service. You can visualize this within Datadog APM when the color of the immediate parent on a flame graph is a different color.
- **Span** - A span represents a logical unit of work in a distributed system for a given time period. Multiple spans construct a trace.

Learn how to ask
questions.

Operating & Observability



Emily Freeman
@editingemily

O11y is not about logs and
alerts

1. Instrument code

2. Make sense

3. Make visible

Be curious

Software that works (and
you know it)

Thanks!