Google Cloud

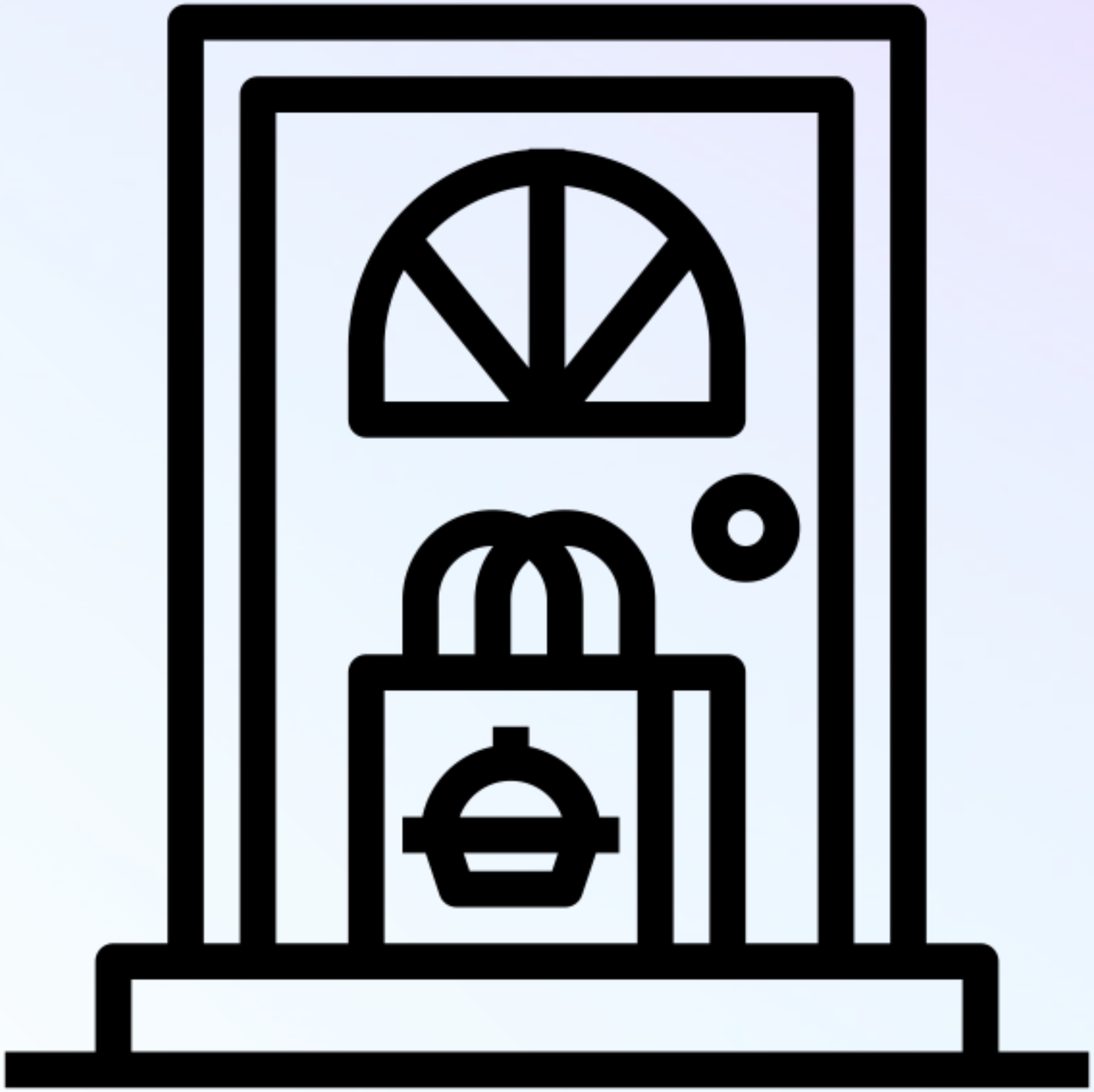
Next '24

Shifting left, Delivering right

Insights from Datadog's Software Delivery Journey

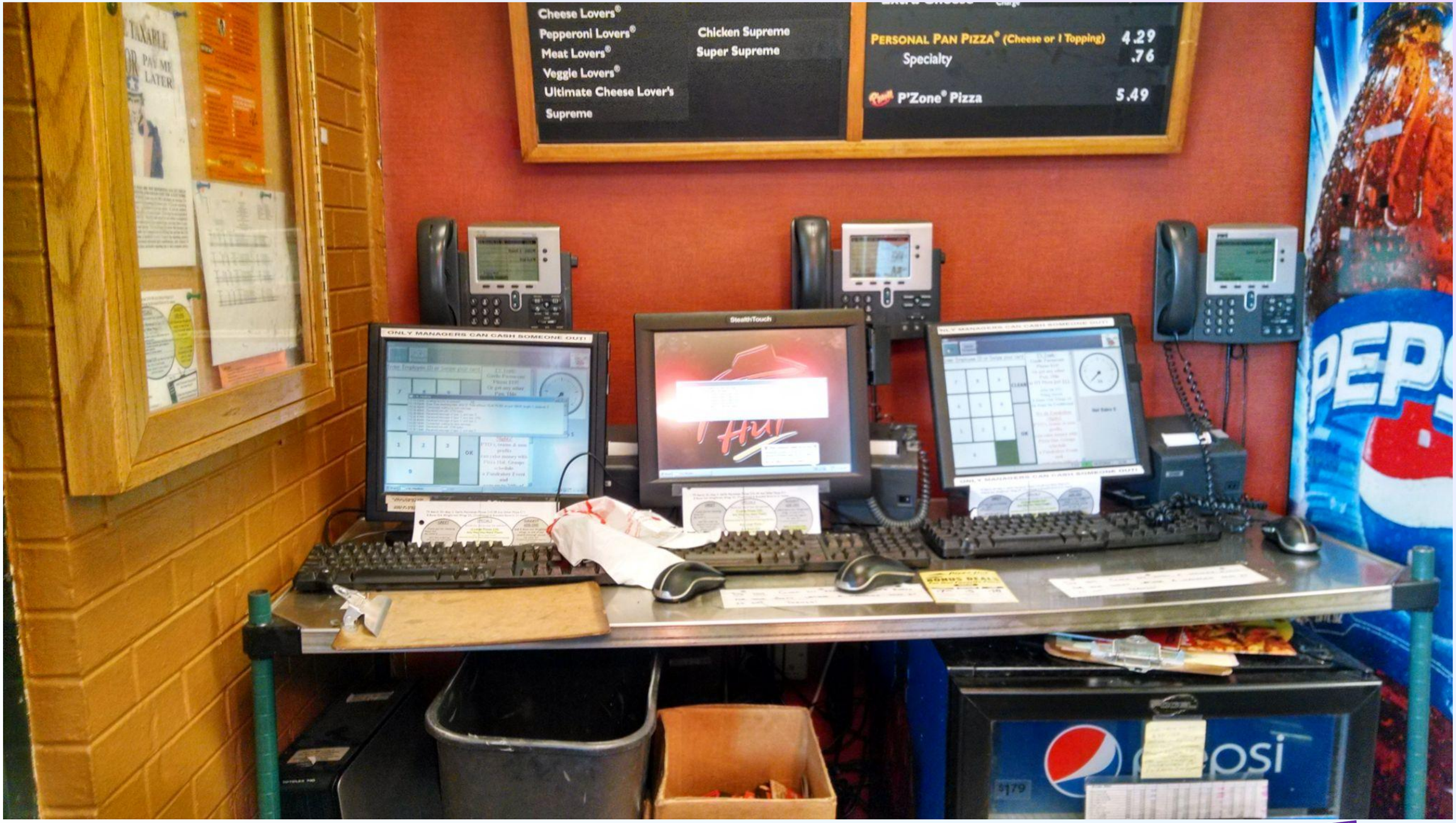
Ajuna Kyaruzi

Senior SRE & DevOps
Advocate at Datadog



Created by ferdizzimo From Noun Project

DATADOG



DATADOG

Meanwell Packaging CC BY 2.0,
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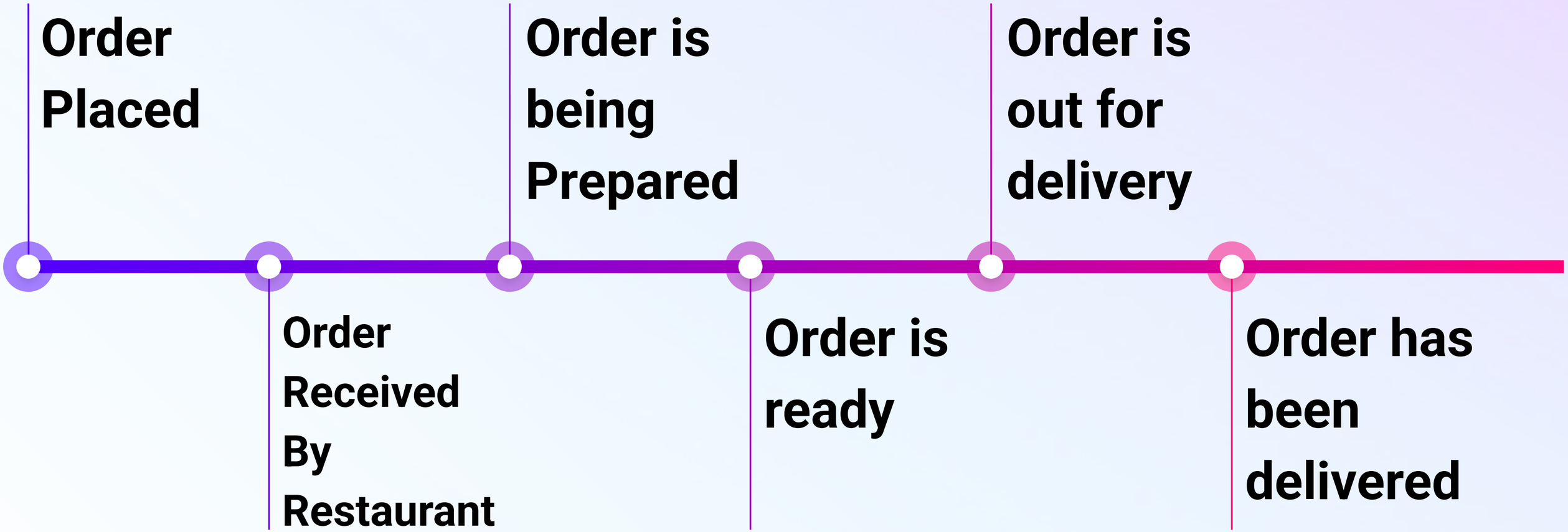
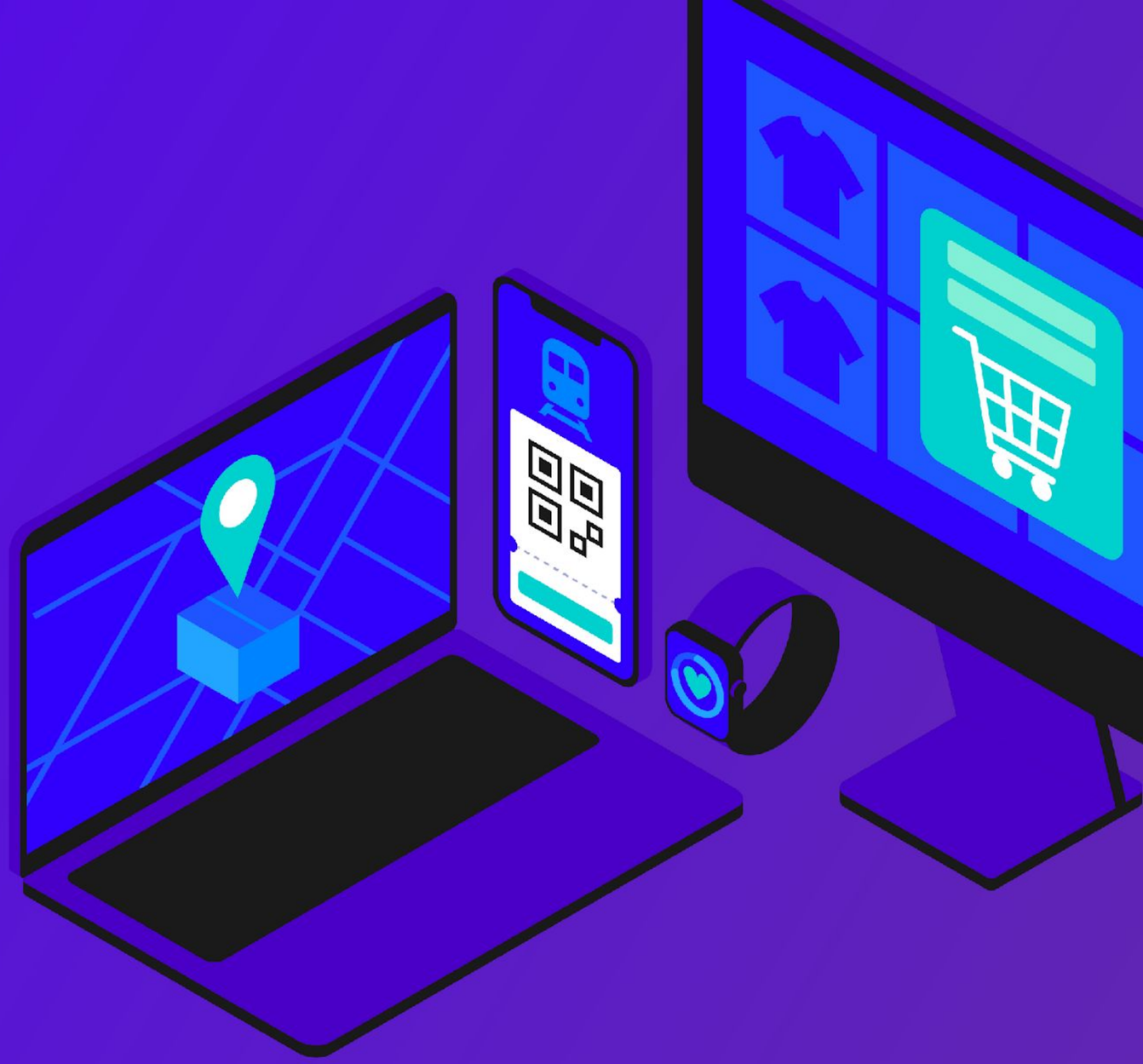

Order Placed
Order Received By Restaurant
Order is being Prepared
Order is ready
Order is out for delivery
Order has been delivered

DATADOG

77%

US Consumers ordered food delivery in the past month



Doordash Food Delivery Statistics

get.doordash.com/en-us/blog/food-delivery-statistics

Order Details

Joe's Home of soup dumplings

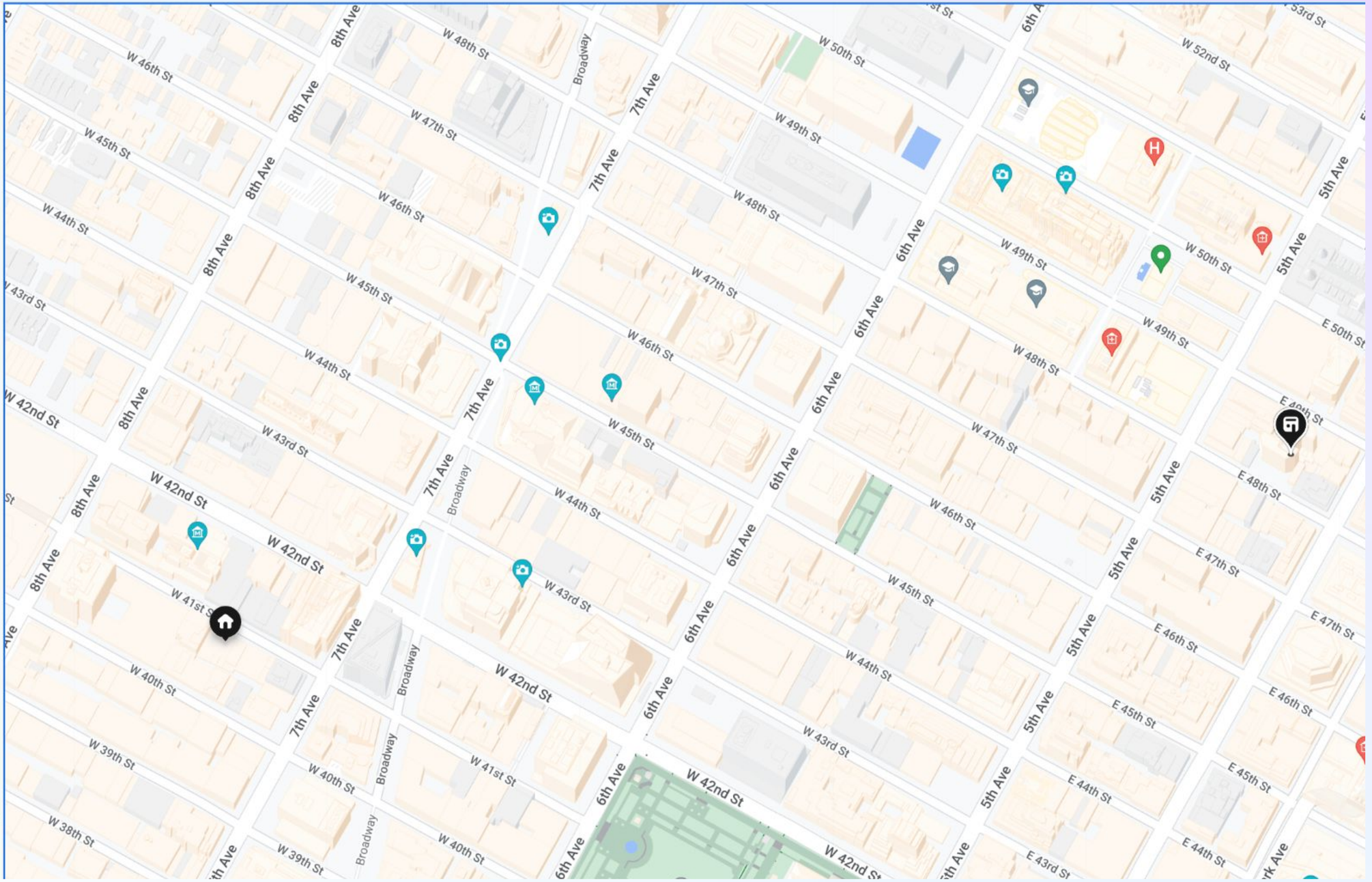
Download Receipt Help

Use the app to follow your order in real-time.

Ajuna K

Order Details

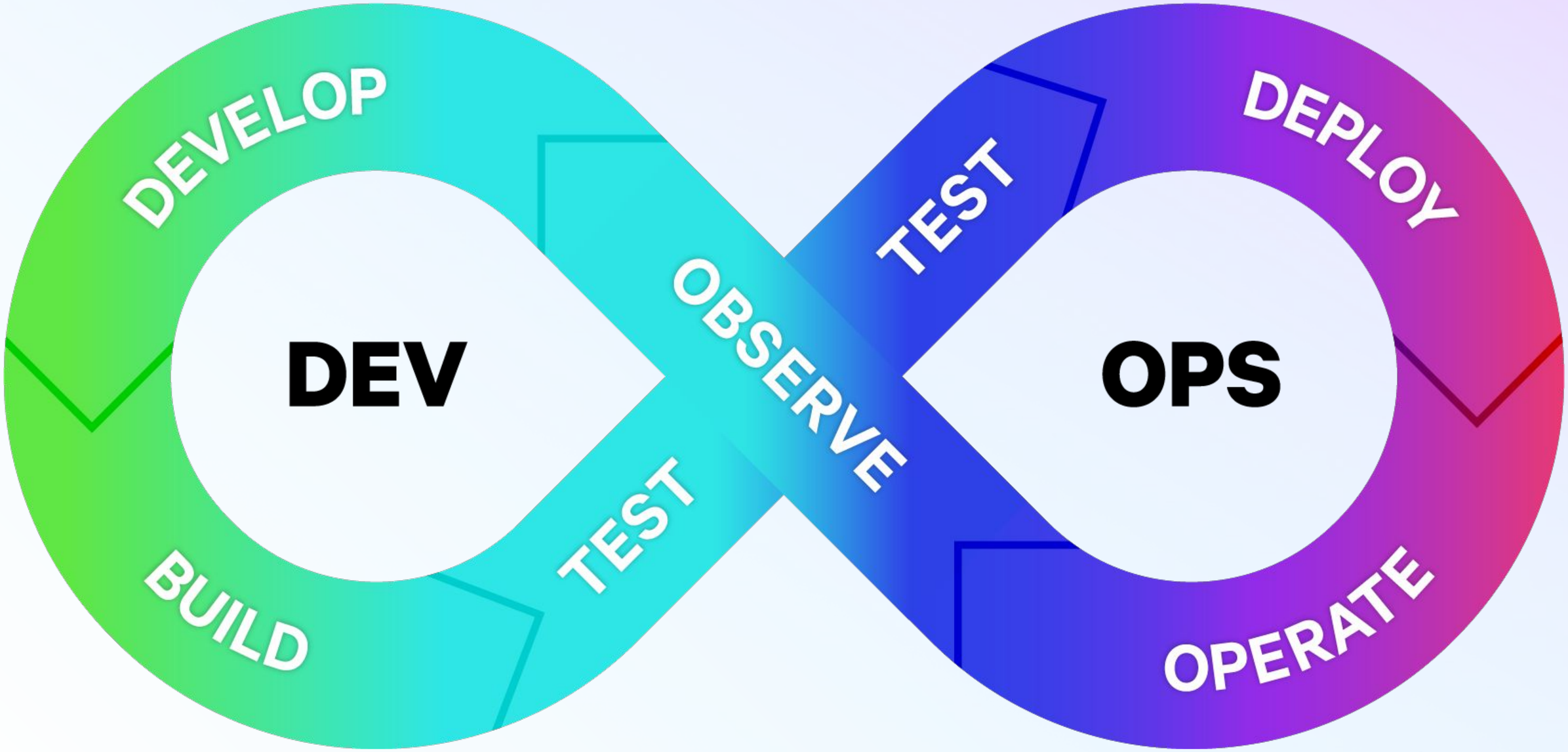
1× 小籠包 / Pork Steamed Buns (6 Pieces) /	$11.25



DATADOG

DATADOG

Software Development Lifecycle



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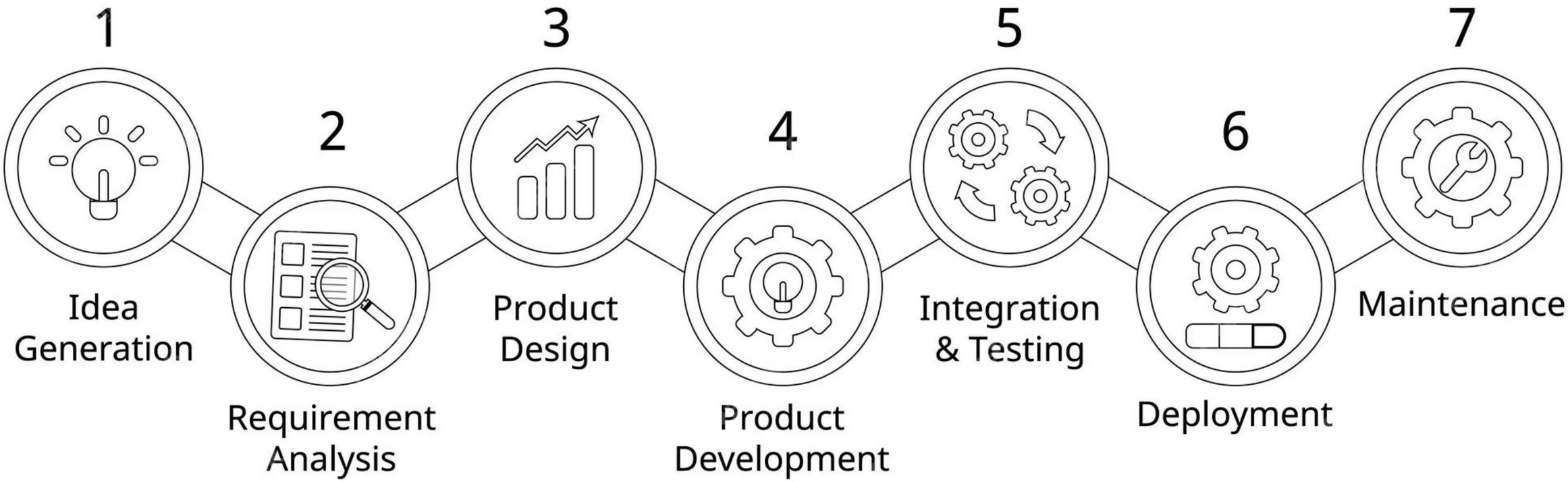
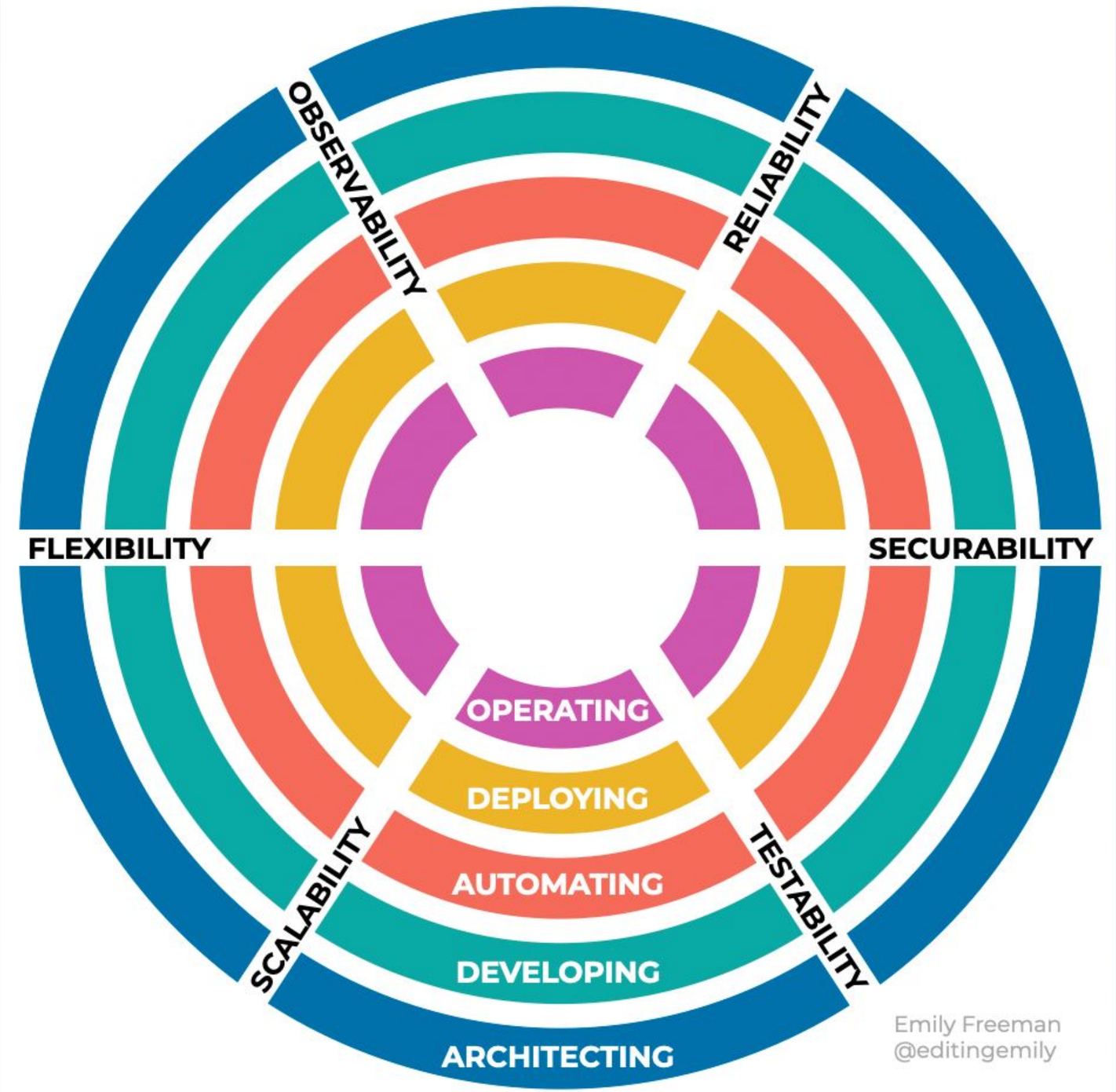
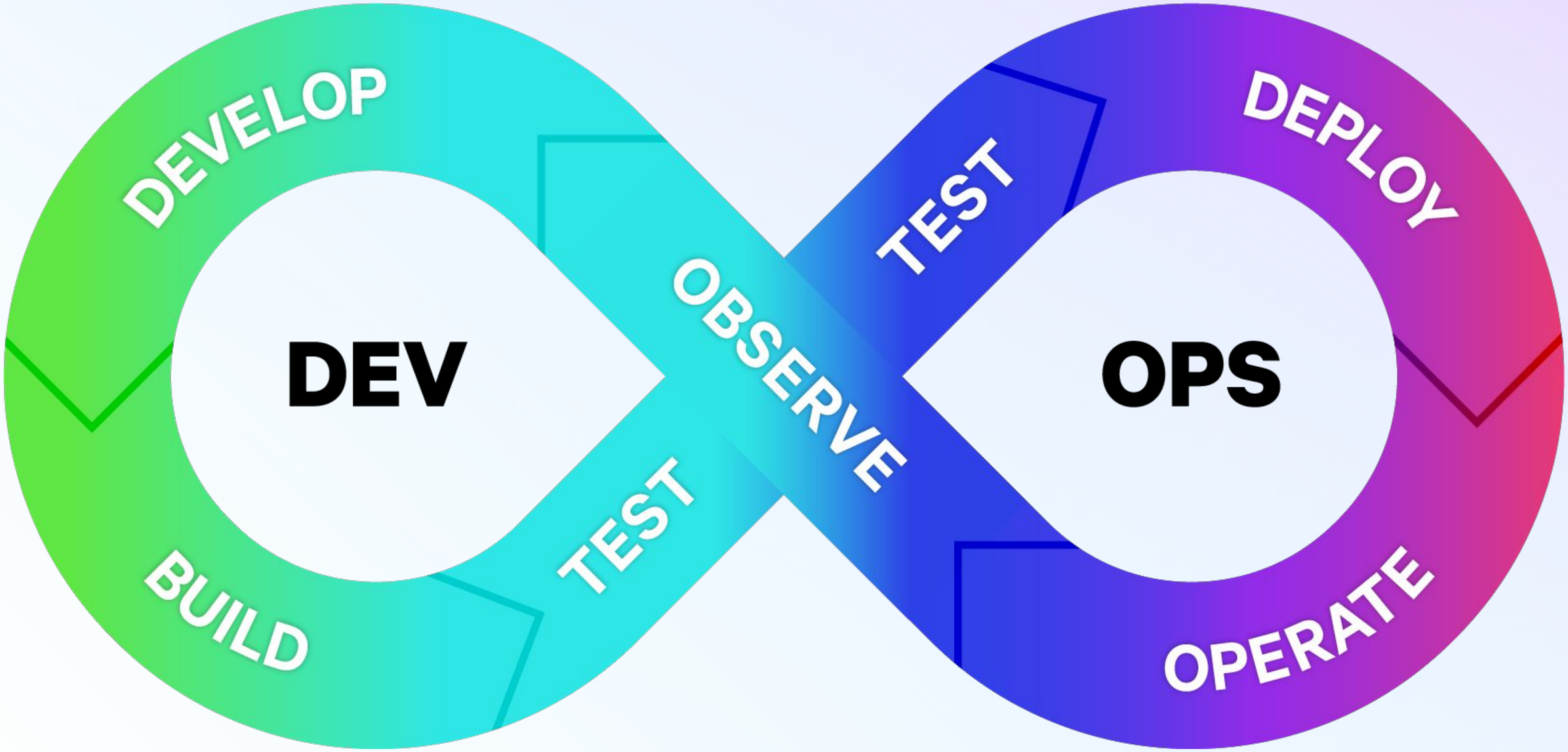

1
Idea Generation
2
Requirement Analysis
3
Product Design
4
Product Development
5
Integration & Testing
6
Deployment
7
Maintenance


OBSERVABILITY
RELIABILITY
FLEXIBILITY
SECURABILITY
OPERATING
DEPLOYING
AUTOMATING
DEVELOPING
ARCHITECTING
SCALABILITY
TESTABILITY
Emily Freeman
@editingemily

DATADOG

Software Development Lifecycle



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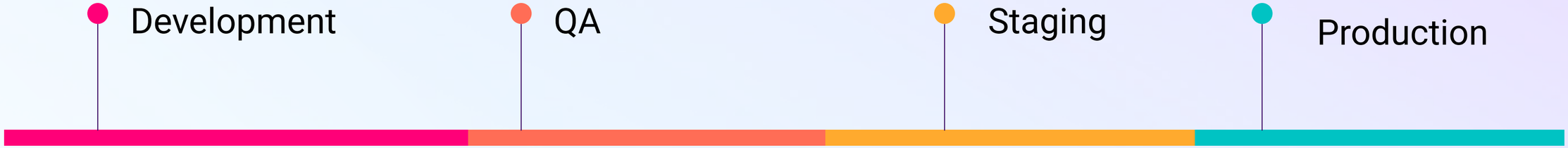
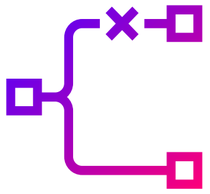


Shifting left

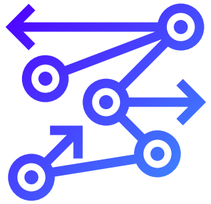
...and bringing that level of visibility to your tests and pipelines in earlier stage environments

Taking visibility mostly seen in production...

Lack of visibility in the SDLC



Hard to debug failures and regressions

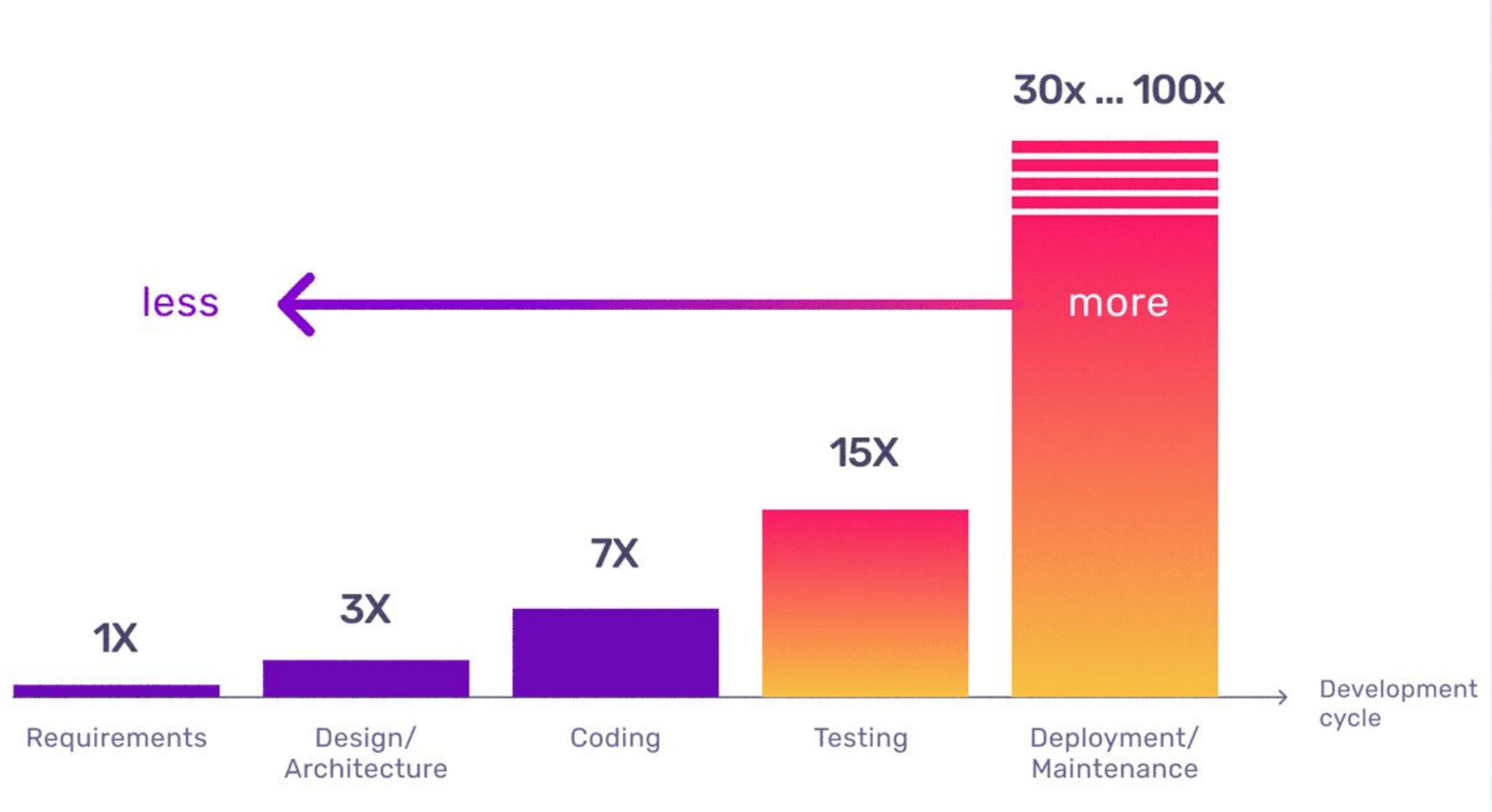


Complex builds lead to slow release velocity

CI/CD costs only increase over time

DevEx – enable developers to do their best work

Cost of finding bugs in the SDLC



https://www.functionize.com/bxlog/the-cost-of-finding-bugs-later-in-the-sdlc

DATADOG

What does shifting left look like?

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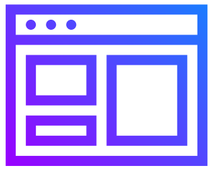
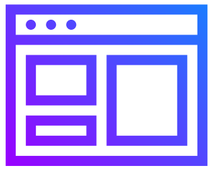
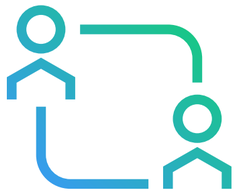


Tooling consolidation & automation

What does shifting left look like?

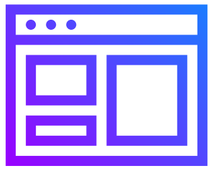


Tooling consolidation & automation

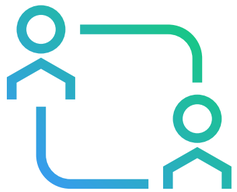


Developer experience & productivity

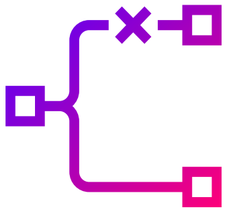
What does shifting left look like?



Tooling consolidation & automation

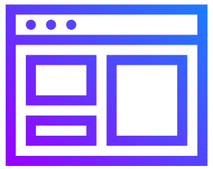


Developer experience & productivity



Code & release quality

What does shifting left look like?



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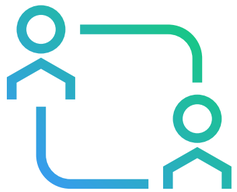
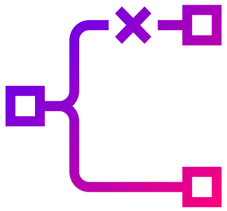


Developer experience & productivity



Code & release quality

Measure & accelerate software delivery

A Datadog Case Study

DATADOG

DATADOG

SaaS

New York, NY

27k+ Customers

BUSINESS DRIVERS

Datadog's internal Developer Experience team is able to improve and maintain platform stability while supporting the velocity and experience of product engineering teams

DATADOG CAPABILITIES

- **CI Pipeline Visibility**
- CI Test Visibility
- Intelligent Test Runner

CHALLENGE

Tooling sprawl Multiple CI providers and testing languages

Reactive to development issues "Firefighting" troubleshooting by internal platform teams

Difficult to understand the system Didn't know how to improve stability and performance of CI/CD

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CHALLENGE

Developer frustration and loss of trusts in tests - no incentive

Retries in CI racked up costs When builds fail, first instinct was to hit retry. "Probably a flaky test" – tribal knowledge at best

Collateral damage Developers will inherit and run other developers' flaky tests, no path to remediation

DATADOG

SaaS

New York, NY

27k+ Customers

BUSINESS DRIVERS

Increased developer productivity and satisfaction by accelerating feedback loops, as well as decreased CI costs by $M. Engineers debugging complex integration tests report up to 98% reduction in MTTR (3 hours to 5 minutes)

DATADOG CAPABILITIES

CI Pipeline Visibility

CI Test Visibility

Intelligent Test Runner

SOLUTION

Single pane of glass Aggregated visibility into pipelines, stages, and jobs across providers

Reduced alert fatigue Instead of every team investigating a failure, routed alerts to teams and individuals responsible

Identify high-leverage problem areas Found most problematic pipelines and jobs with the most impact, optimized queue times, made informed decisions to balance velocity & stability

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SaaS

New York, NY

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BUSINESS DRIVERS

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DATADOG CAPABILITIES

CI Pipeline Visibility

CI Test Visibility

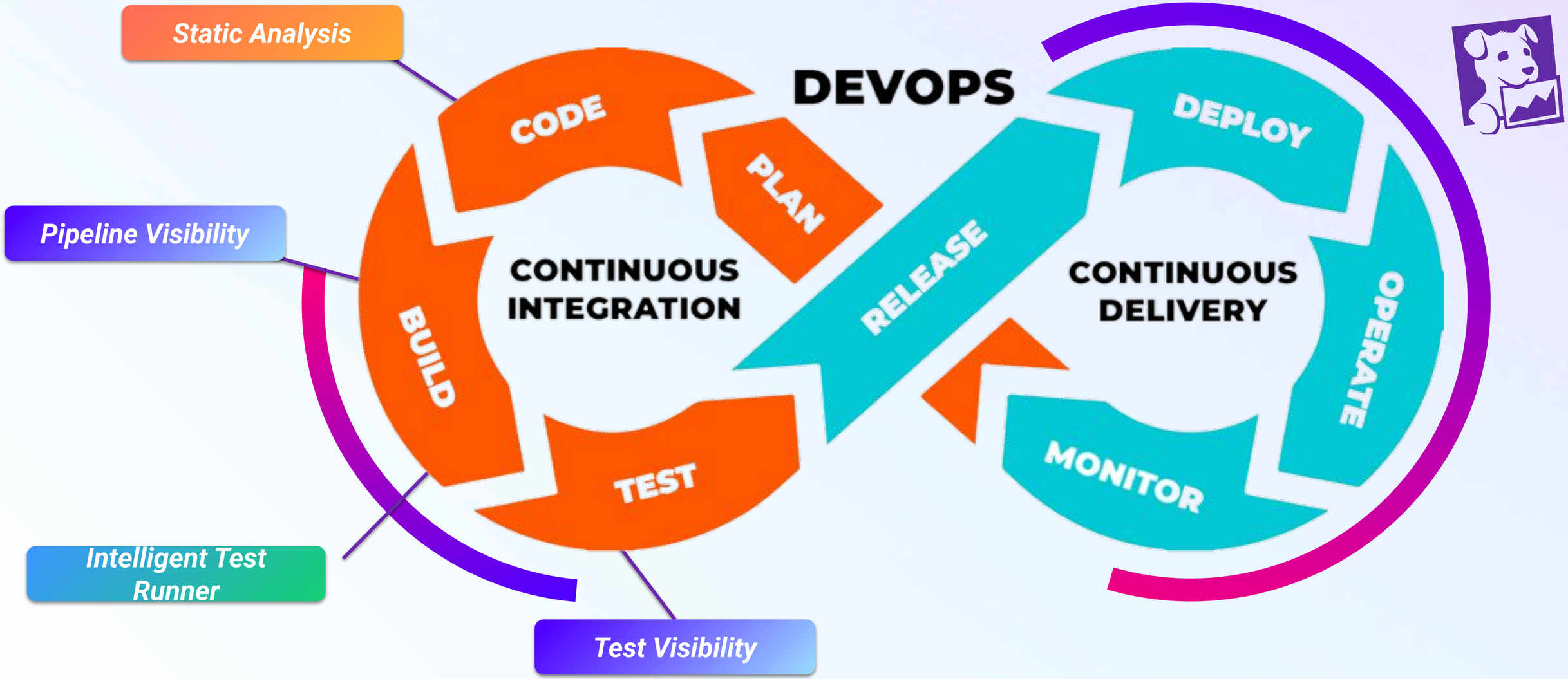
Intelligent Test Runner

SOLUTION

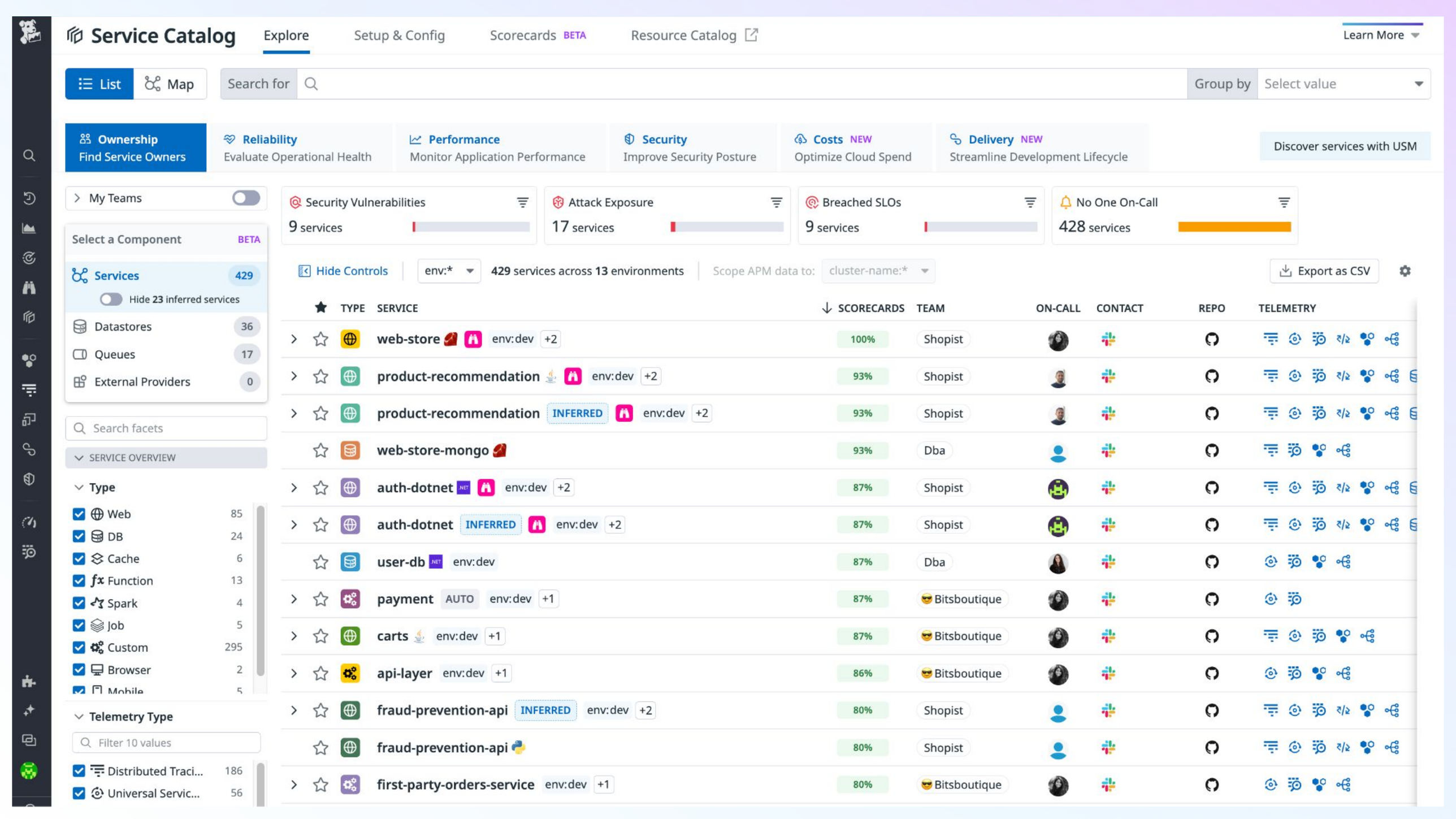
Flaky test triage & prioritization Which tests should we prioritize fixing first?

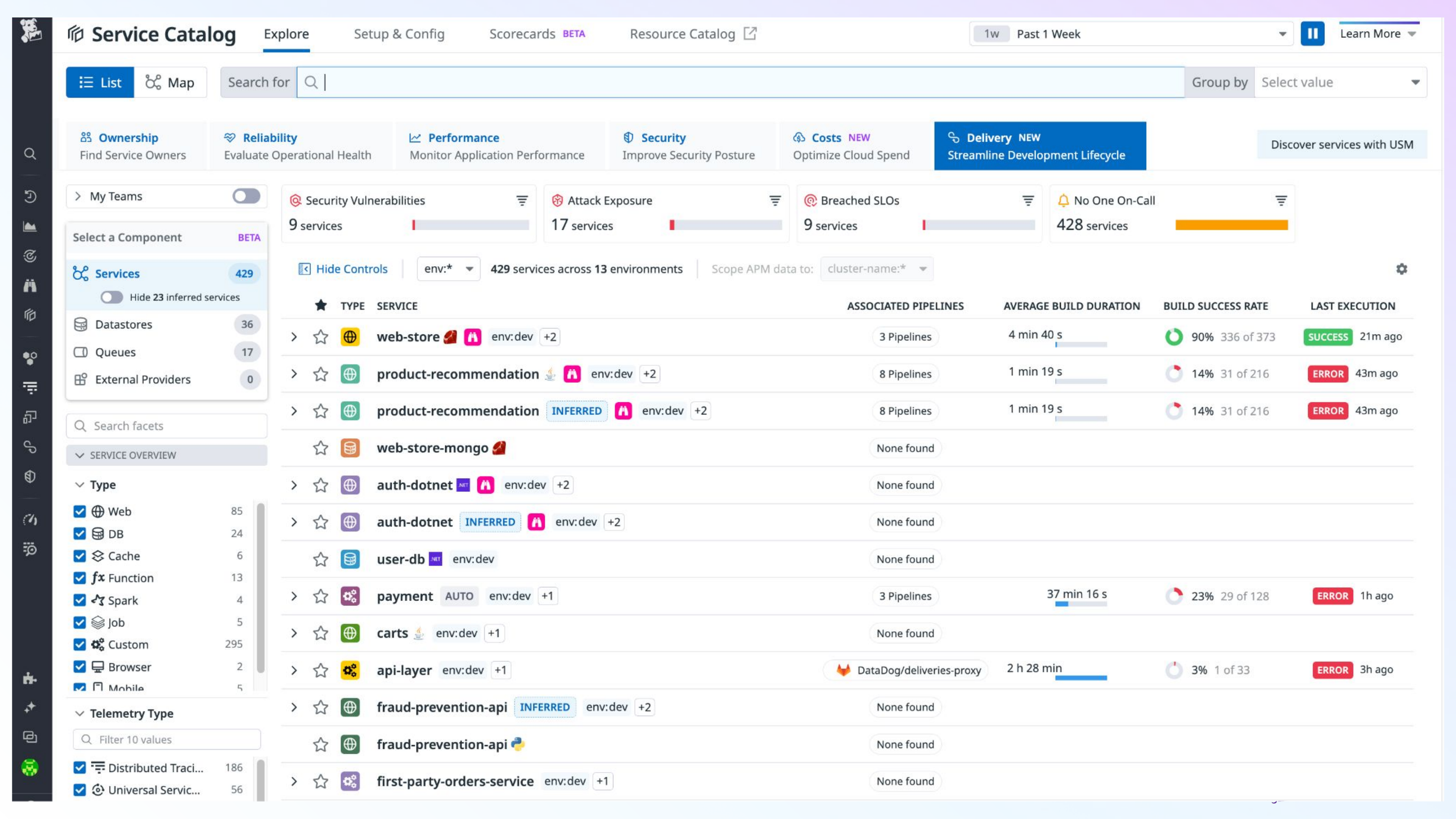
Distinguish between true failure and flake Data-driven instead of relying on tribal knowledge & feelings

Built a culture of accountability Tie flakiness back to a specific commit and developer, alert on flakiness, post weekly reports to Slack


Static Analysis
Pipeline Visibility
Intelligent Test Runner
Test Visibility
DEVOPS
CODE
PLAN
BUILD
TEST
CONTINUOUS INTEGRATION
RELEASE
DEPLOY
OPERATE
MONITOR
CONTINUOUS DELIVERY

DATADOG


Service Catalog
Explore
Setup & Config
Scorecards BETA
Resource Catalog
Learn More
List
Map
Search for
Group by
Select value
Ownership
Find Service Owners
Reliability
Evaluate Operational Health
Performance
Monitor Application Performance
Security
Improve Security Posture
Costs NEW
Optimize Cloud Spend
Delivery NEW
Streamline Development Lifecycle
Discover services with USM
My Teams
Select a Component BETA
Services 429
Hide 23 inferred services
Datastores 36
Queues 17
External Providers 0
Search facets
SERVICE OVERVIEW
Type
Web 85
DB 24
Cache 6
Function 13
Spark 4
Job 5
Custom 295
Browser 2
Mobile 5
Telemetry Type
Filter 10 values
Distributed Traci... 186
Universal Servic... 56
Security Vulnerabilities
9 services
Attack Exposure
17 services
Breached SLOs
9 services
No One On-Call
428 services
Hide Controls
env:*
429 services across 13 environments
Scope APM data to:
cluster-name:*
Export as CSV
TYPE
SERVICE
SCORECARDS
TEAM
ON-CALL
CONTACT
REPO
TELEMETRY
web-store env:dev +2 100% Shopist
product-recommendation env:dev +2 93% Shopist
product-recommendation INFERRED env:dev +2 93% Shopist
web-store-mongo 93% Dba
auth-dotnet env:dev +2 87% Shopist
auth-dotnet INFERRED env:dev +2 87% Shopist
user-db env:dev 87% Dba
payment AUTO env:dev +1 87% Bitsboutique
carts env:dev +1 87% Bitsboutique
api-layer env:dev +1 86% Bitsboutique
fraud-prevention-api INFERRED env:dev +2 80% Shopist
fraud-prevention-api 80% Shopist
first-party-orders-service env:dev +1 80% Bitsboutique


Service Catalog
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External Providers 0
Search facets
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Type
Web 85
DB 24
Cache 6
Function 13
Spark 4
Job 5
Custom 295
Browser 2
Mobile 5
Telemetry Type
Filter 10 values
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Universal Servic... 56
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Hide Controls
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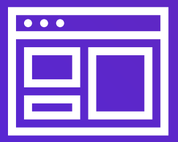
429 services across 13 environments
Scope APM data to:
cluster-name:*
TYPE
SERVICE
ASSOCIATED PIPELINES
AVERAGE BUILD DURATION
BUILD SUCCESS RATE
LAST EXECUTION
web-store env:dev +2
3 Pipelines
4 min 40 s
90% 336 of 373
SUCCESS 21m ago
product-recommendation env:dev +2
8 Pipelines
1 min 19 s
14% 31 of 216
ERROR 43m ago
product-recommendation INFERRED env:dev +2
8 Pipelines
1 min 19 s
14% 31 of 216
ERROR 43m ago
web-store-mongo
None found
auth-dotnet env:dev +2
None found
auth-dotnet INFERRED env:dev +2
None found
user-db env:dev
None found
payment AUTO env:dev +1
3 Pipelines
37 min 16 s
23% 29 of 128
ERROR 1h ago
carts env:dev +1
None found
api-layer env:dev +1
DataDog/deliveries-proxy
2 h 28 min
3% 1 of 33
ERROR 3h ago
fraud-prevention-api INFERRED env:dev +2
None found
fraud-prevention-api
None found
first-party-orders-service env:dev +1
None found

Tooling Consolidation & Automation

Aggregating data across tools/vendors

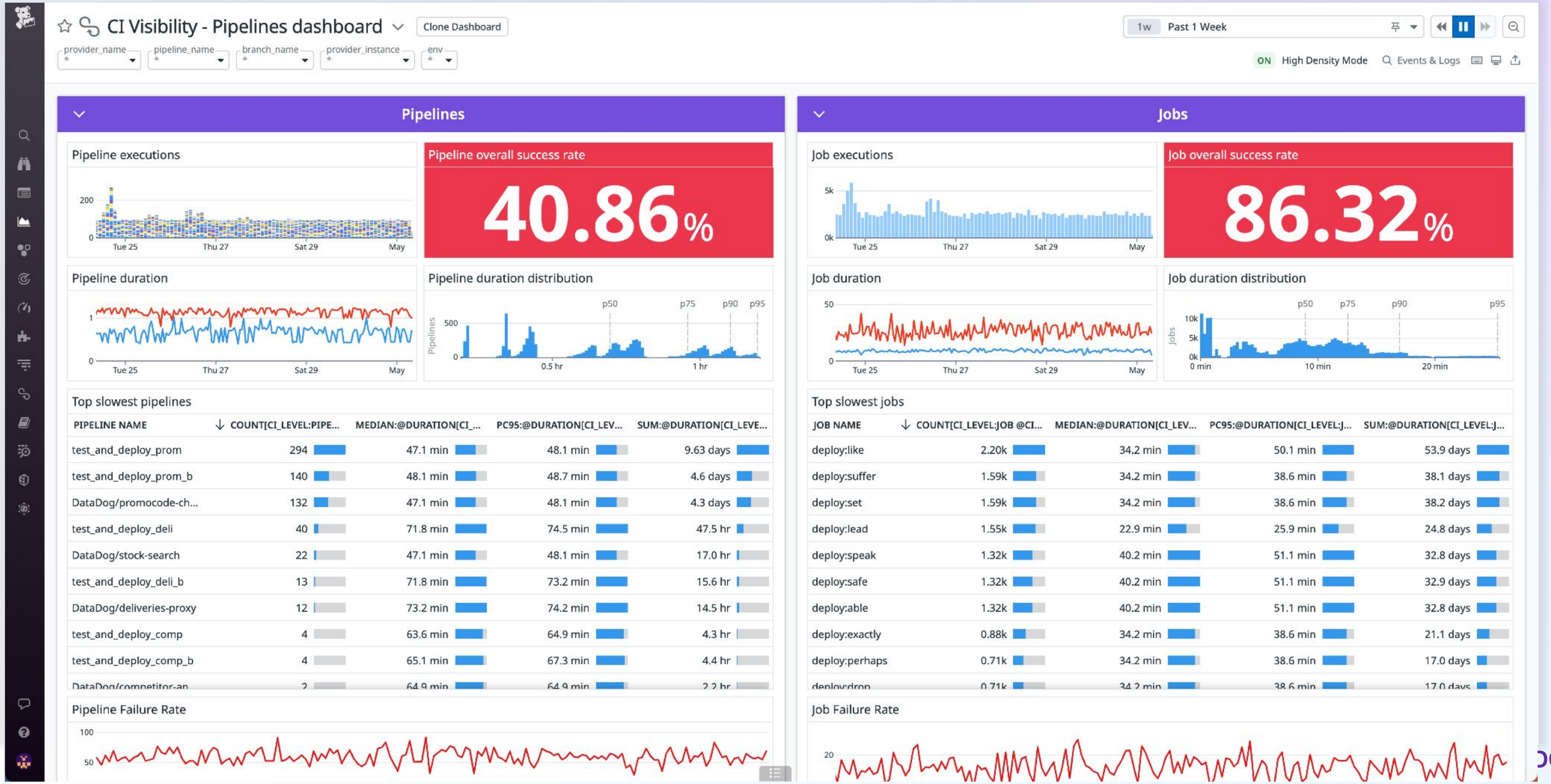
CI/CD provider integrations

Test instrumentation across languages & frameworks



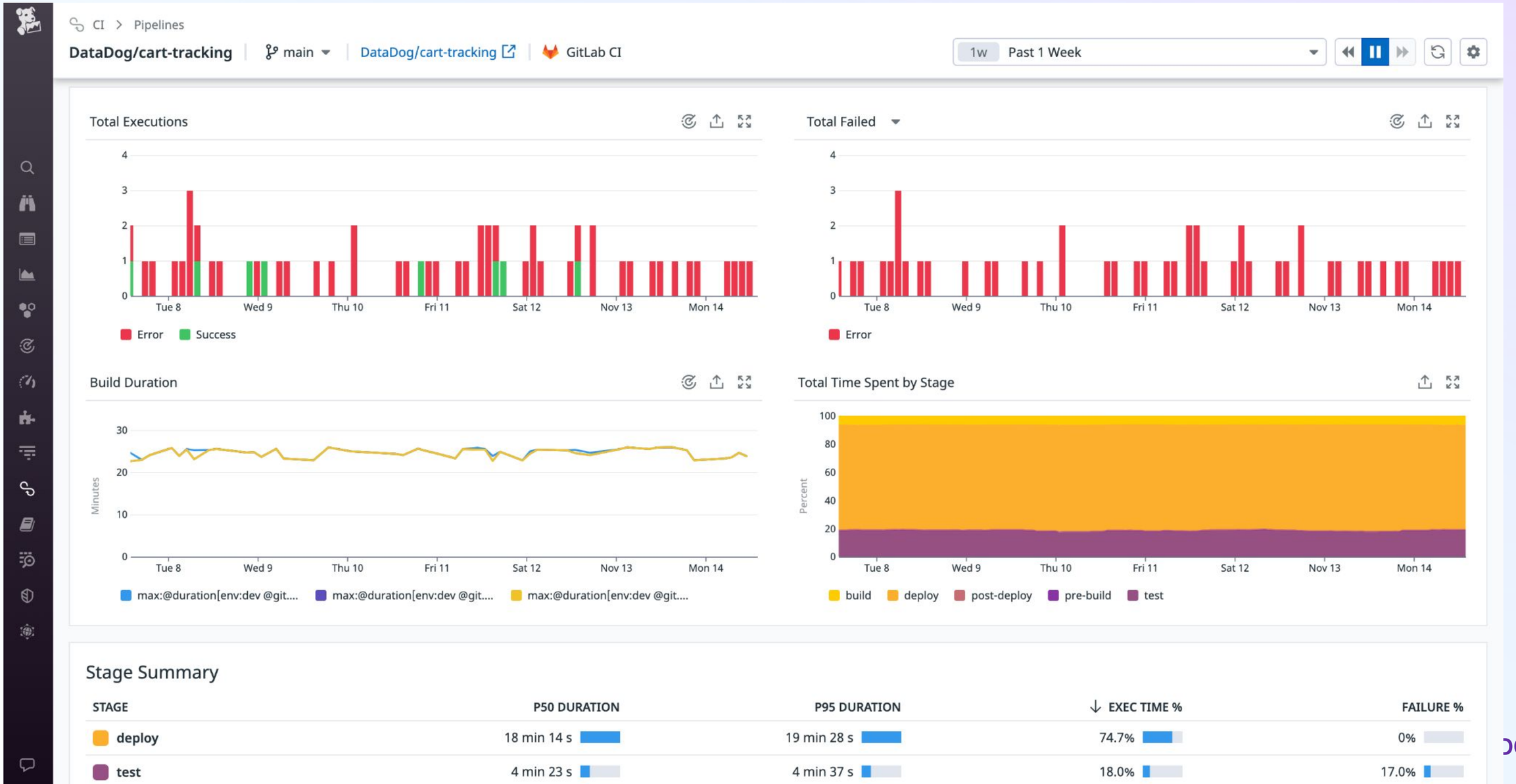
Reduced context switching

Continuous Integration Pipeline Visibility



Continuous Integration Pipeline Visibility

Granular visibility into your pipelines, stages, & jobs across providers



Stage Summary

STAGE	P50 DURATION	P95 DURATION	↓ EXEC TIME %	FAILURE %
deploy	18 min 14 s	19 min 28 s	74.7%	0%
test	4 min 23 s	4 min 37 s	18.0%	17.0%

Developer Experience & Productivity

Reactive fixes → proactive ownership

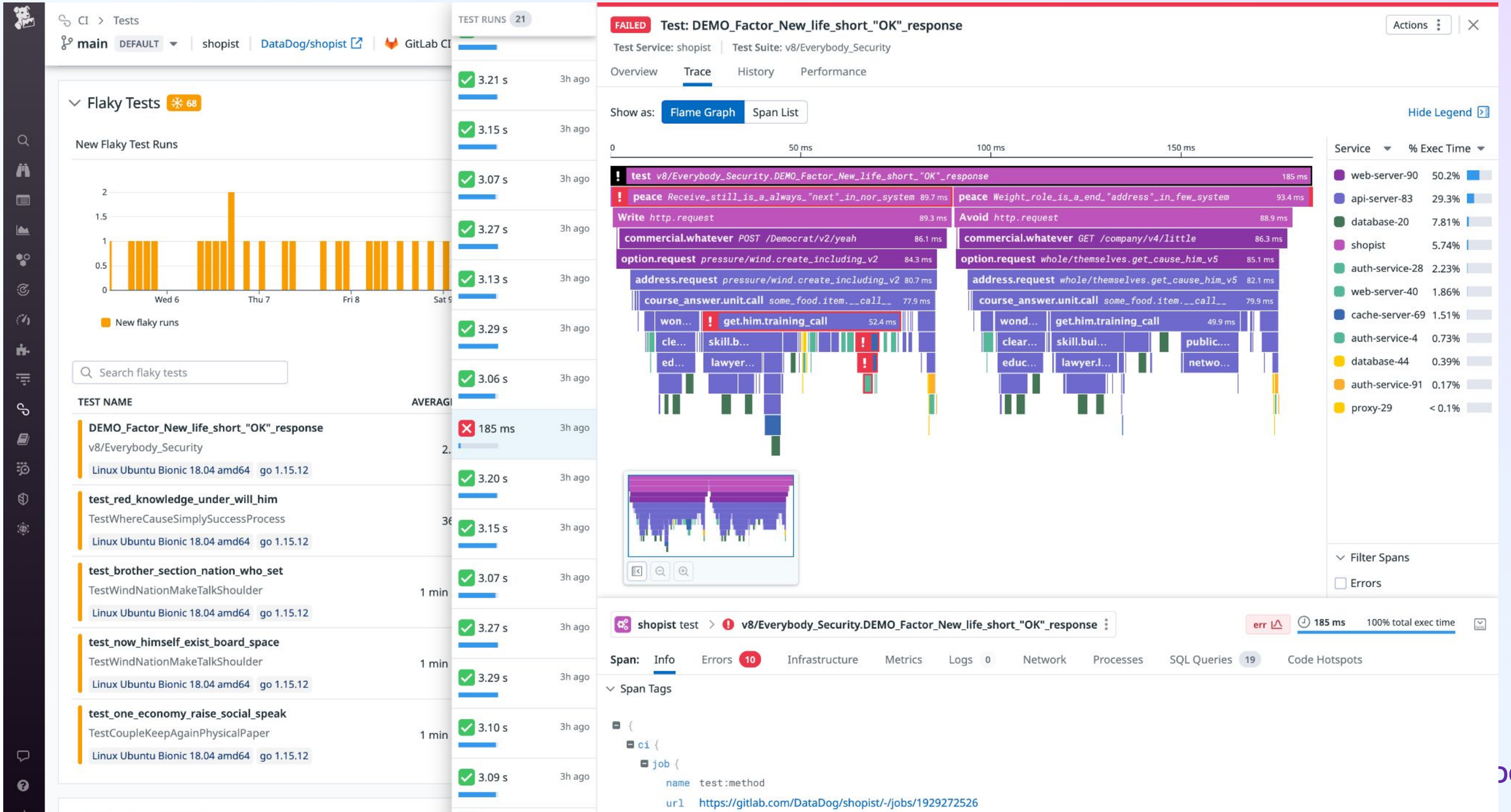
Identify, triage, and manage flaky tests

Developer-oriented dashboards & views

Self-service & best practices

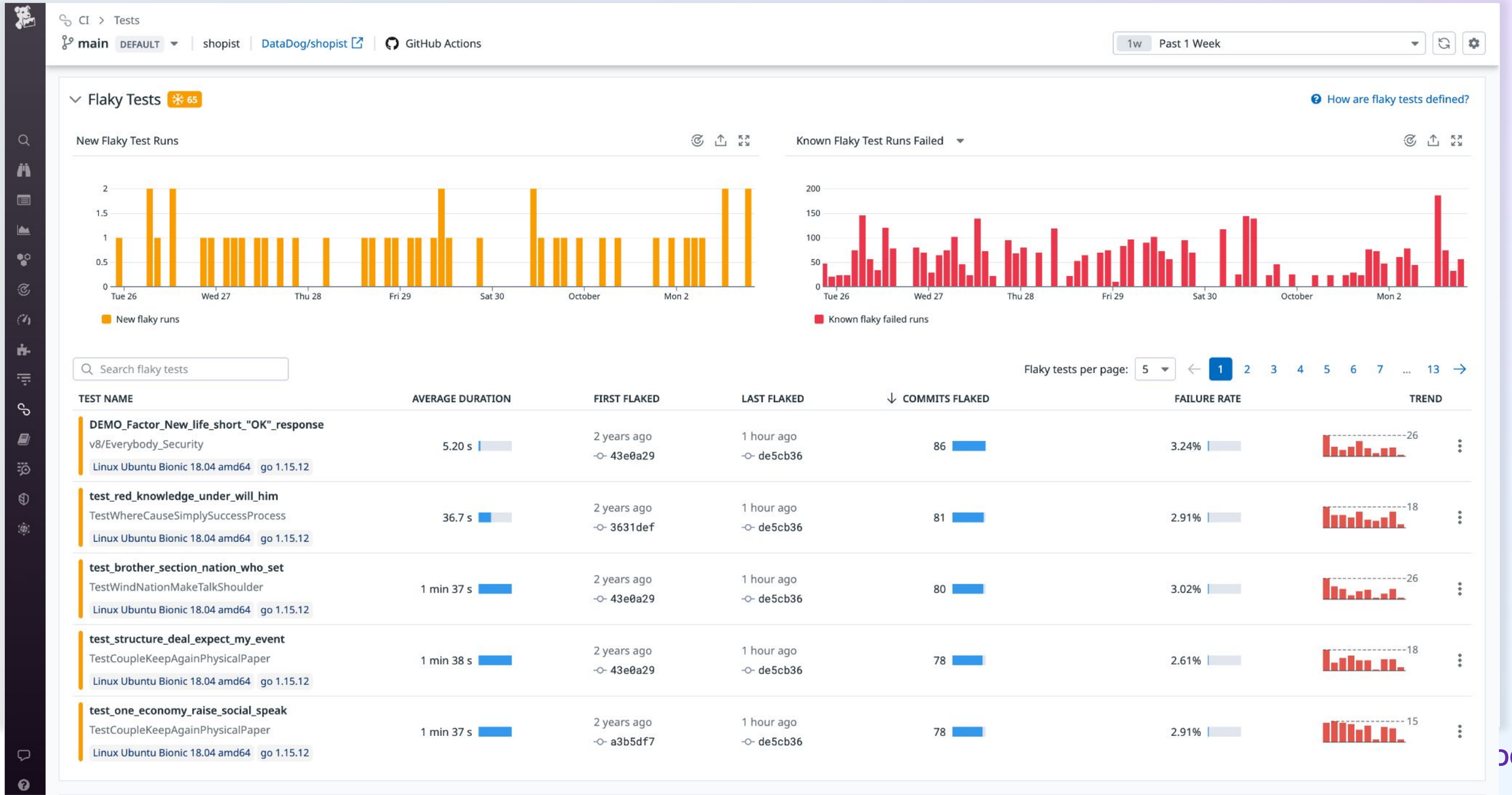
Continuous Integration Test Visibility

Track & troubleshoot flaky tests & complex test failures

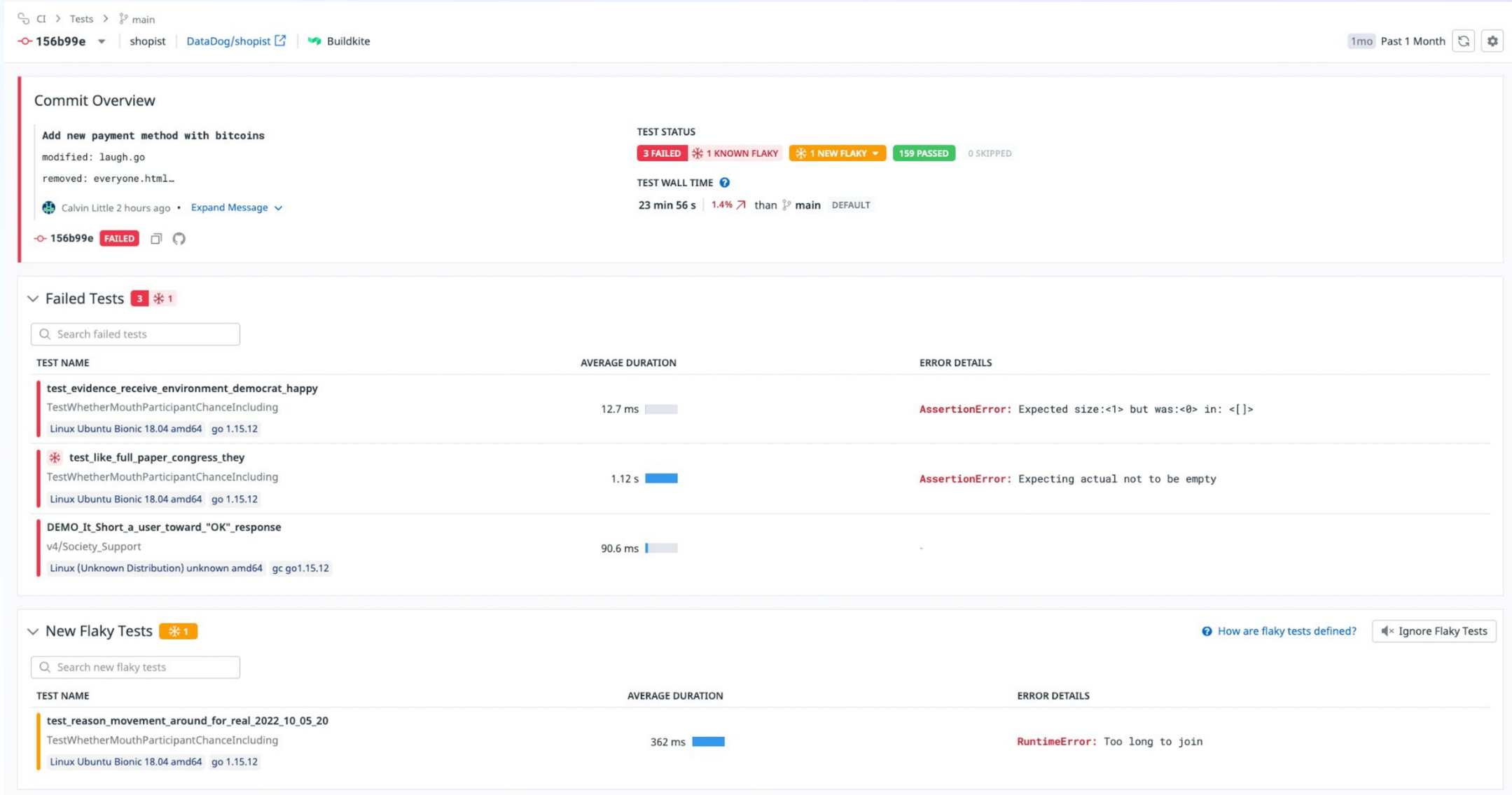


Flaky Test Management

Manage & triage flaky tests

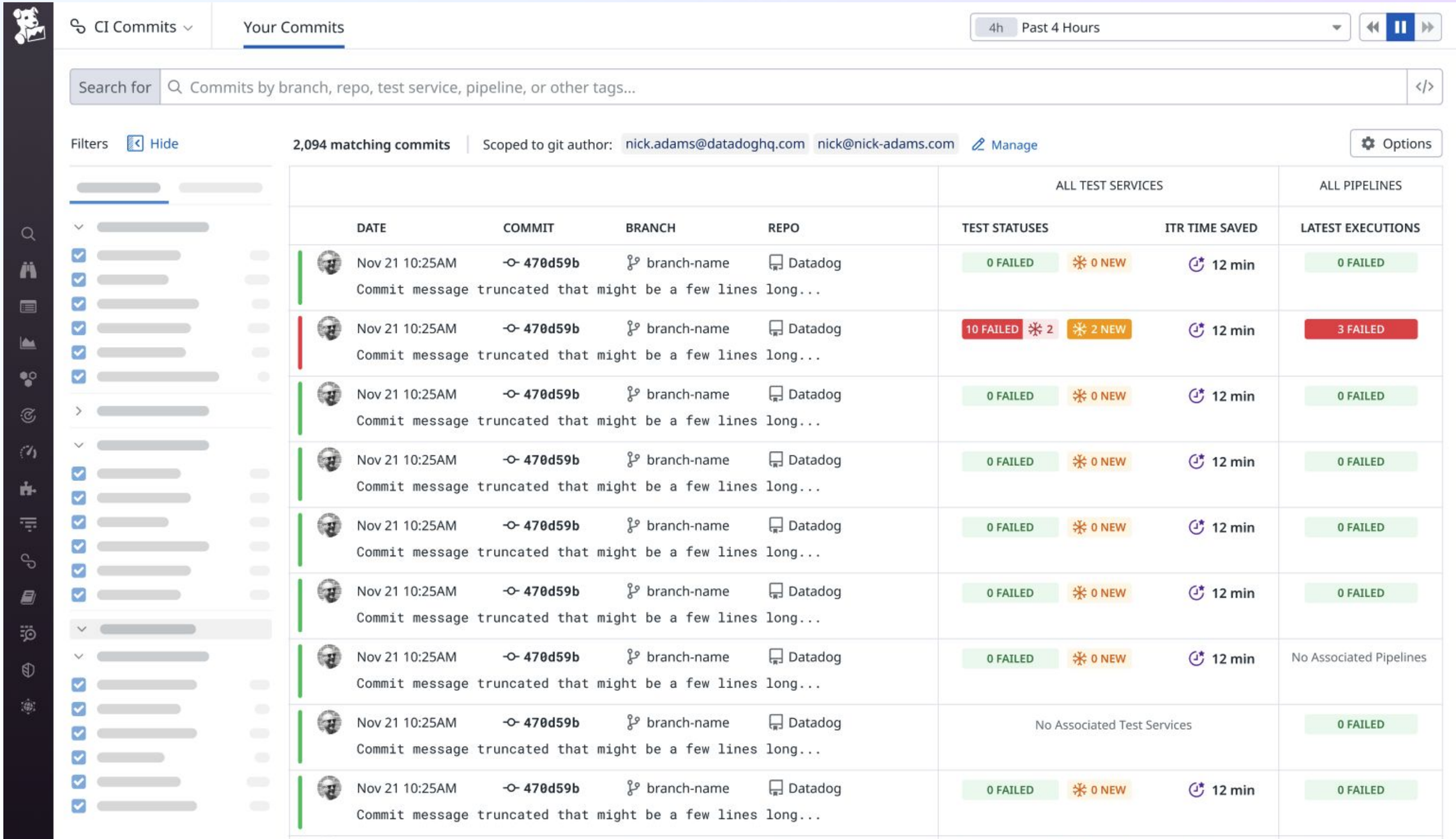


Known Flaky Tests



DATADOG

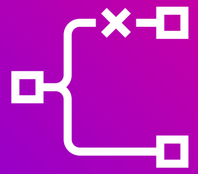
My Commits View



Code & Release Quality

Scaling fast, but with confidence

Catch errors & vulnerabilities in development



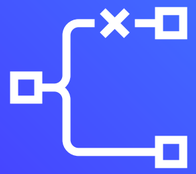
Gate workflows based on signals

Increase speed & stability of pipelines & tests

Intelligent Test Runner

Speed up time to market by running only the tests impacted by a code change and skip the rest

Increase developer experience via faster feedback loops



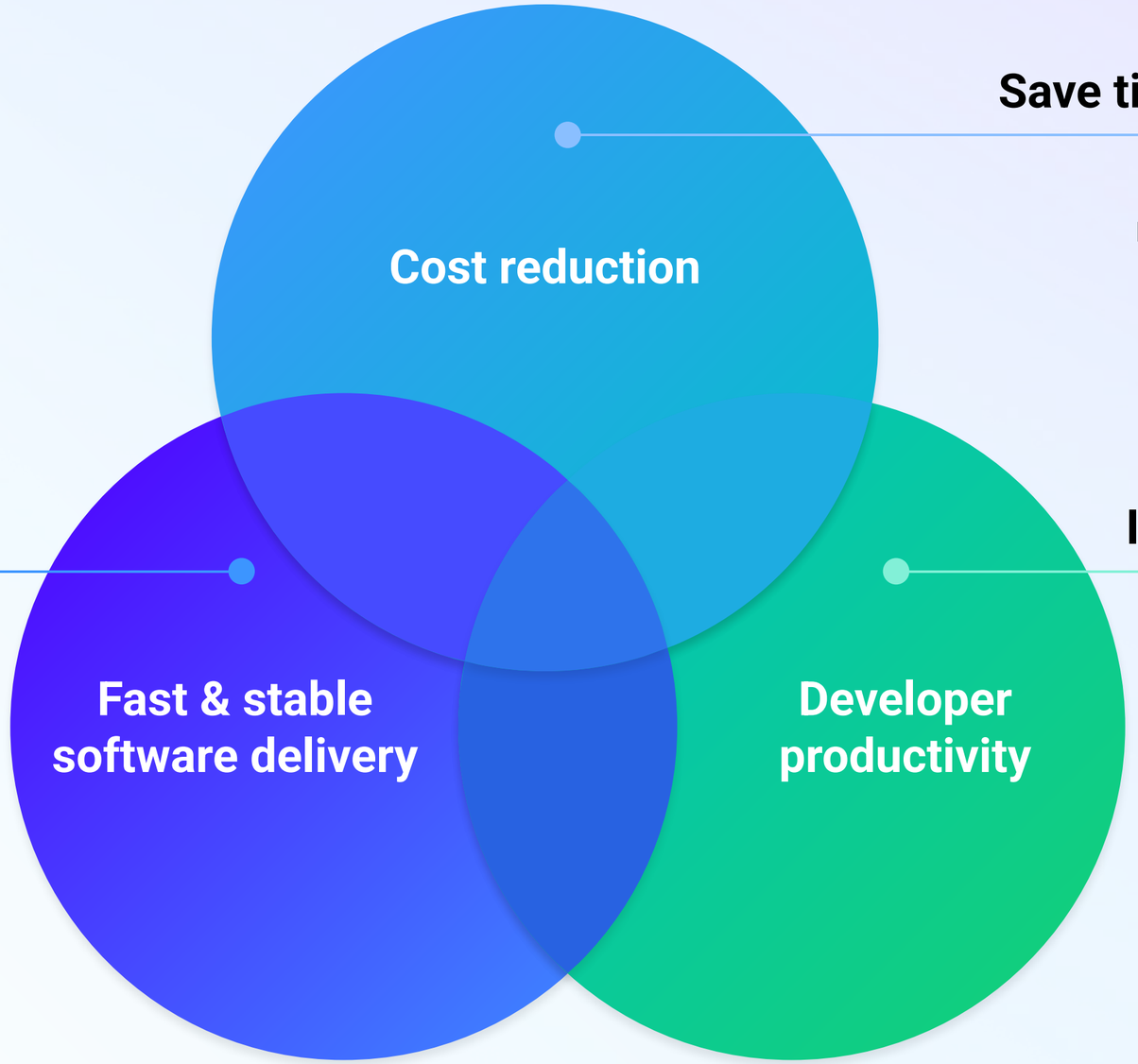
Accelerate software delivery with fewer broken CI pipelines

Reduce time and costs spent in CI

Intelligent Test Runner - How does it work?

Intelligent Test Runner

Accelerate time to market by running only the tests impacted by a code change and skip the rest



Save time & money spent in CI

Reduce compute time spent running unnecessary tests that can fail your builds

Merge & deploy faster

Fewer broken CI pipelines due to test failures

Increase feedback loops

Developers can focus on feature development vs. waiting for tests to run

CI Visibility - Intelligent Test Runner

Export | Events & Logs | Configure | + Add Widgets

Saved Views | env: * | service: * | repository: * | branch: * | commit: * | author_email: * | language: *

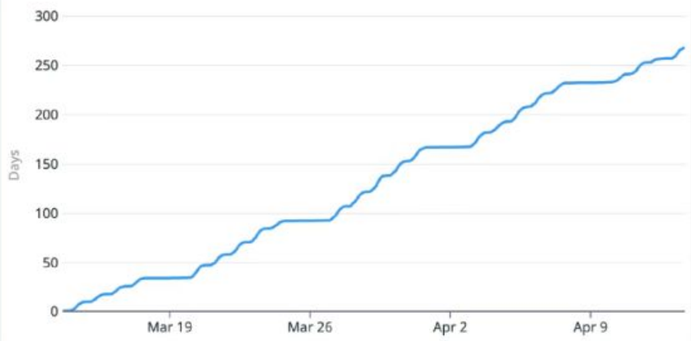
1mo Mar 13, 4:26 pm – Apr 13, 5:26 pm

Time Saved by Tests Skipped

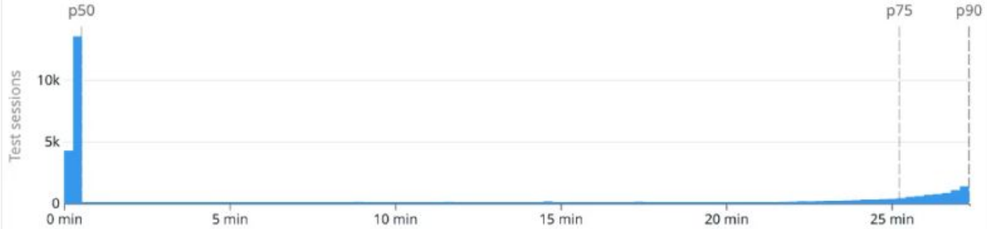
Total time saved

267.78 days

Total time saved



Time saved distribution



35.25k test sessions

max	32.7 min
p99	29.6 min
p95	27.3 min
p90	27.3 min
p75	25.2 min

Time saved per Test Service

Total **267d 19h**

Shopist
242d 15h

web..

web..

Time saved per Repository

Total **267d 19h**

gitlab.ddbuild.io/DataDog/Shopist
267d 5h

Intelligent Test Runner

Intelligent Test Runner is Datadog's test impact analysis solution. Reduce your time spent testing by 50-98% by only running tests relevant to the code changed.

More

Intelligent Test Runner Usage

Repositories using ITR

7

Test Services using ITR

% Test Services using ITR

21.31%

Git Authors using ITR

534

% Git Authors using ITR

28.79%

Commits using ITR

17.21k

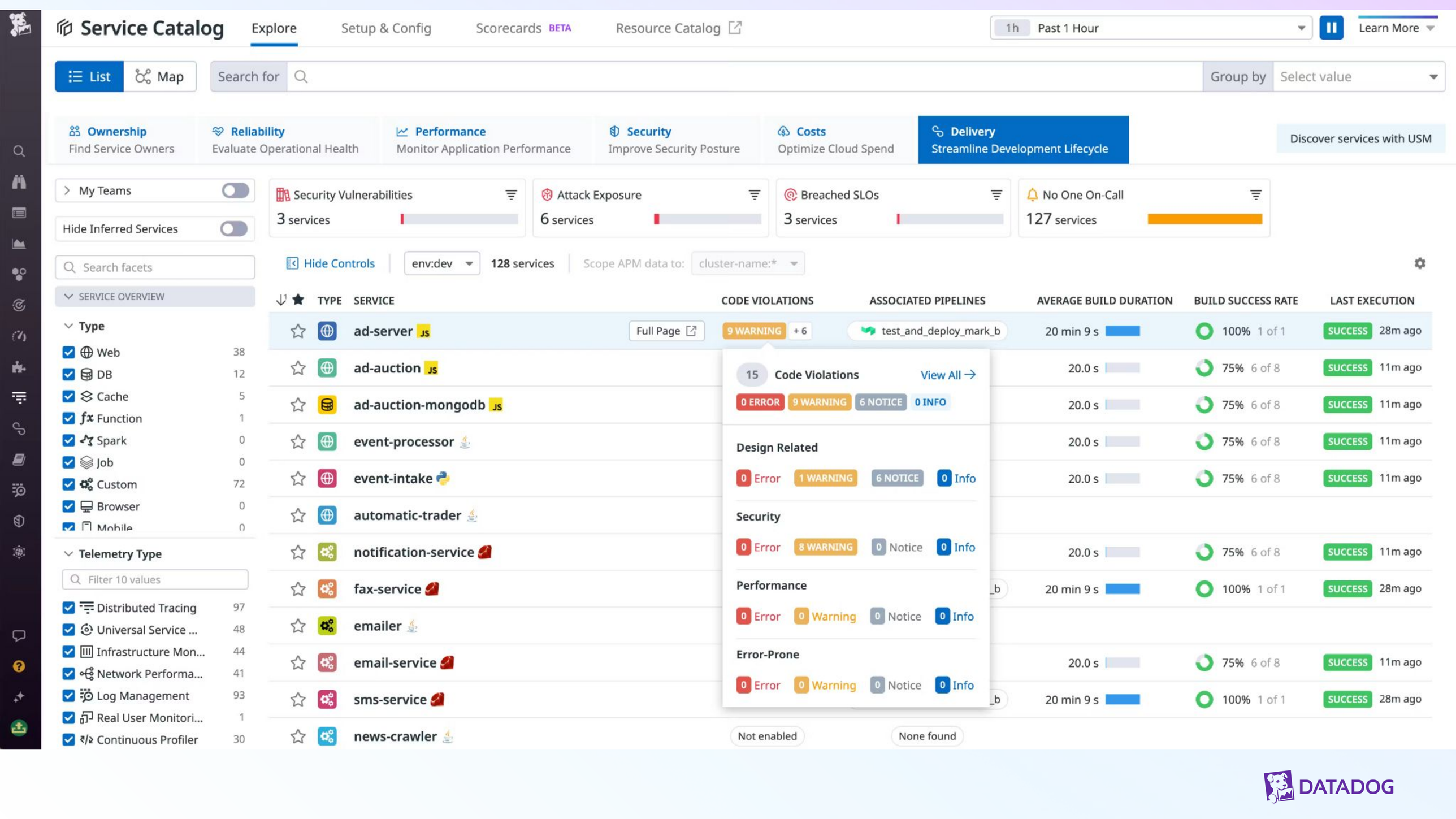
% Repositories using ITR

14.89%

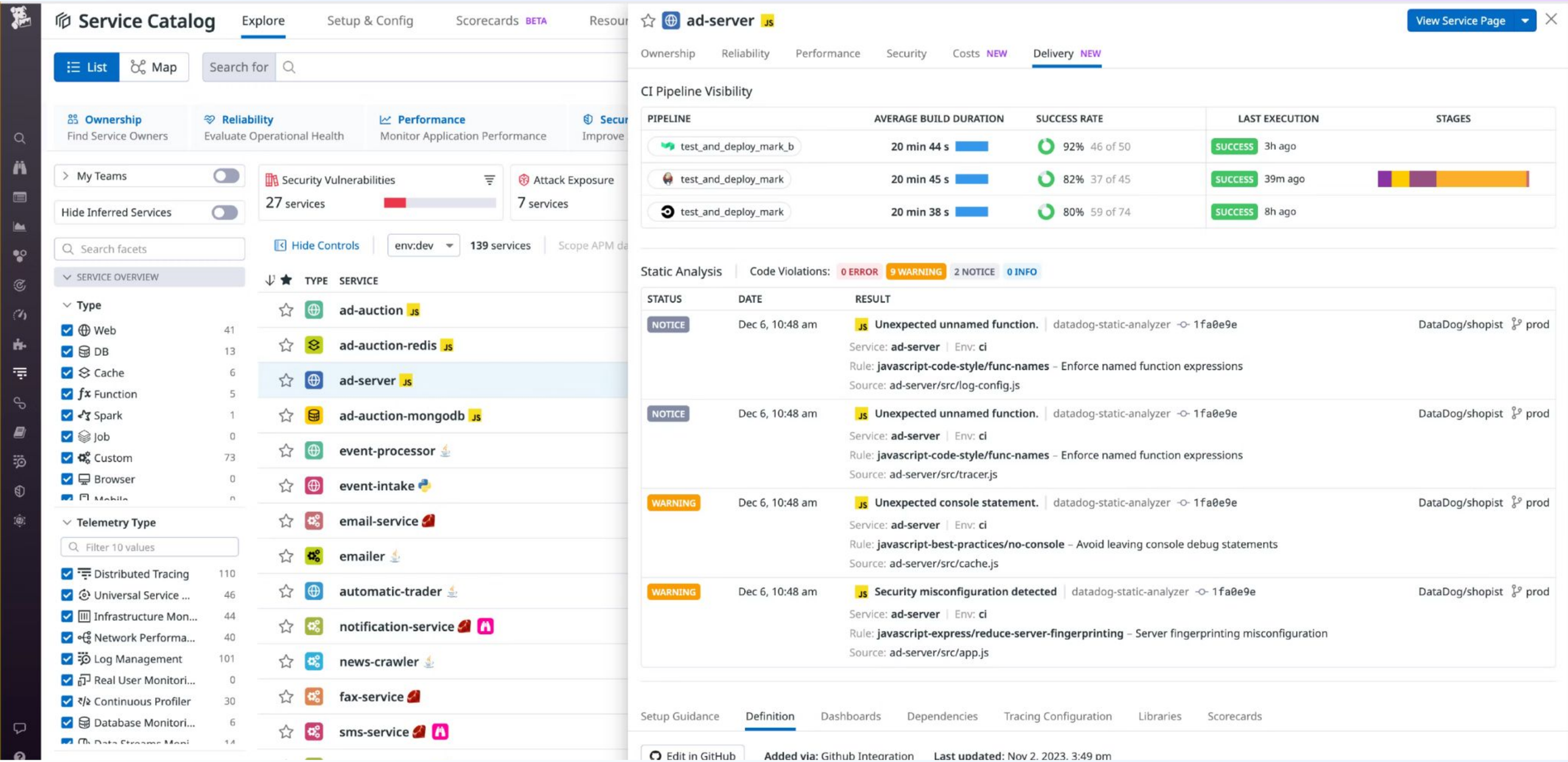
% Commits using ITR

22.55%

DATADOG


Service Catalog
Explore
Setup & Config
Scorecards BETA
Resource Catalog
1h Past 1 Hour
Learn More
List
Map
Search for
Group by
Select value
Ownership
Find Service Owners
Reliability
Evaluate Operational Health
Performance
Monitor Application Performance
Security
Improve Security Posture
Costs
Optimize Cloud Spend
Delivery
Streamline Development Lifecycle
Discover services with USM
My Teams
Hide Inferred Services
Search facets
SERVICE OVERVIEW
Type
Web 38
DB 12
Cache 5
Function 1
Spark 0
Job 0
Custom 72
Browser 0
Mobile 0
Telemetry Type
Filter 10 values
Distributed Tracing 97
Universal Service ... 48
Infrastructure Mon... 44
Network Performa... 41
Log Management 93
Real User Monitori... 1
Continuous Profiler 30
Security Vulnerabilities
3 services
Attack Exposure
6 services
Breached SLOs
3 services
No One On-Call
127 services
Hide Controls
env:dev
128 services
Scope APM data to:
cluster-name:*
TYPE
SERVICE
CODE VIOLATIONS
ASSOCIATED PIPELINES
AVERAGE BUILD DURATION
BUILD SUCCESS RATE
LAST EXECUTION
ad-server JS
Full Page
9 WARNING +6
test_and_deploy_mark_b
20 min 9 s
100% 1 of 1
SUCCESS 28m ago
ad-auction JS
20.0 s
75% 6 of 8
SUCCESS 11m ago
ad-auction-mongodb JS
20.0 s
75% 6 of 8
SUCCESS 11m ago
event-processor
20.0 s
75% 6 of 8
SUCCESS 11m ago
event-intake
20.0 s
75% 6 of 8
SUCCESS 11m ago
automatic-trader
notification-service
20.0 s
75% 6 of 8
SUCCESS 11m ago
fax-service
20 min 9 s
100% 1 of 1
SUCCESS 28m ago
emailer
email-service
20.0 s
75% 6 of 8
SUCCESS 11m ago
sms-service
20 min 9 s
100% 1 of 1
SUCCESS 28m ago
news-crawler
Not enabled
None found
15 Code Violations
View All
0 ERROR 9 WARNING 6 NOTICE 0 INFO
Design Related
0 Error 1 WARNING 6 NOTICE 0 Info
Security
0 Error 8 WARNING 0 Notice 0 Info
Performance
0 Error 0 Warning 0 Notice 0 Info
Error-Prone
0 Error 0 Warning 0 Notice 0 Info

DATADOG


Service Catalog
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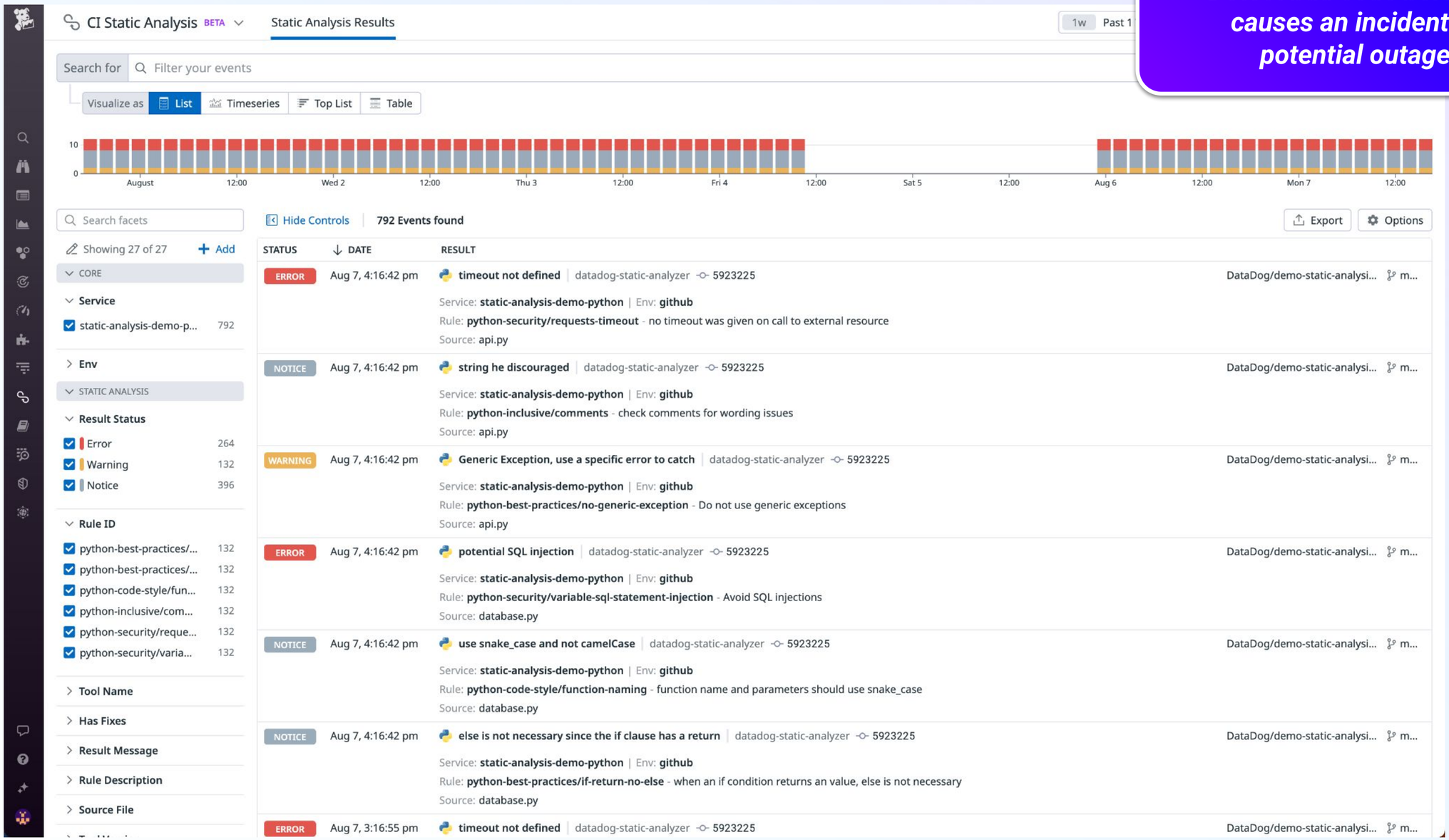
Telemetry Type
Filter 10 values
Distributed Tracing 110
Universal Service ... 46
Infrastructure Mon... 44
Network Performa... 40
Log Management 101
Real User Monitori... 0
Continuous Profiler 30
Database Monitori... 6
Security Vulnerabilities
27 services
Attack Exposure
7 services
Hide Controls
env:dev
139 services
TYPE
SERVICE
ad-auction
ad-auction-redis
ad-server
ad-auction-mongodb
event-processor
event-intake
email-service
emailer
automatic-trader
notification-service
news-crawler
fax-service
sms-service
ad-server
View Service Page
Ownership
Reliability
Performance
Security
Costs NEW
Delivery NEW
CI Pipeline Visibility
PIPELINE
AVERAGE BUILD DURATION
SUCCESS RATE
LAST EXECUTION
STAGES
test_and_deploy_mark_b
20 min 44 s
92% 46 of 50
SUCCESS 3h ago
test_and_deploy_mark
20 min 45 s
82% 37 of 45
SUCCESS 39m ago
test_and_deploy_mark
20 min 38 s
80% 59 of 74
SUCCESS 8h ago
Static Analysis
Code Violations: 0 ERROR 9 WARNING 2 NOTICE 0 INFO
STATUS
DATE
RESULT
NOTICE
Dec 6, 10:48 am
Unexpected unnamed function. | datadog-static-analyzer 1fa0e9e
Service: ad-server | Env: ci
Rule: javascript-code-style/func-names – Enforce named function expressions
Source: ad-server/src/log-config.js
DataDog/shopist prod
NOTICE
Dec 6, 10:48 am
Unexpected unnamed function. | datadog-static-analyzer 1fa0e9e
Service: ad-server | Env: ci
Rule: javascript-code-style/func-names – Enforce named function expressions
Source: ad-server/src/tracer.js
DataDog/shopist prod
WARNING
Dec 6, 10:48 am
Unexpected console statement. | datadog-static-analyzer 1fa0e9e
Service: ad-server | Env: ci
Rule: javascript-best-practices/no-console – Avoid leaving console debug statements
Source: ad-server/src/cache.js
DataDog/shopist prod
WARNING
Dec 6, 10:48 am
Security misconfiguration detected | datadog-static-analyzer 1fa0e9e
Service: ad-server | Env: ci
Rule: javascript-express/reduce-server-fingerprinting – Server fingerprinting misconfiguration
Source: ad-server/src/app.js
DataDog/shopist prod
Setup Guidance
Definition
Dashboards
Dependencies
Tracing Configuration
Libraries
Scorecards
Edit in GitHub
Added via: Github Integration
Last updated: Nov 2, 2023, 3:49 pm

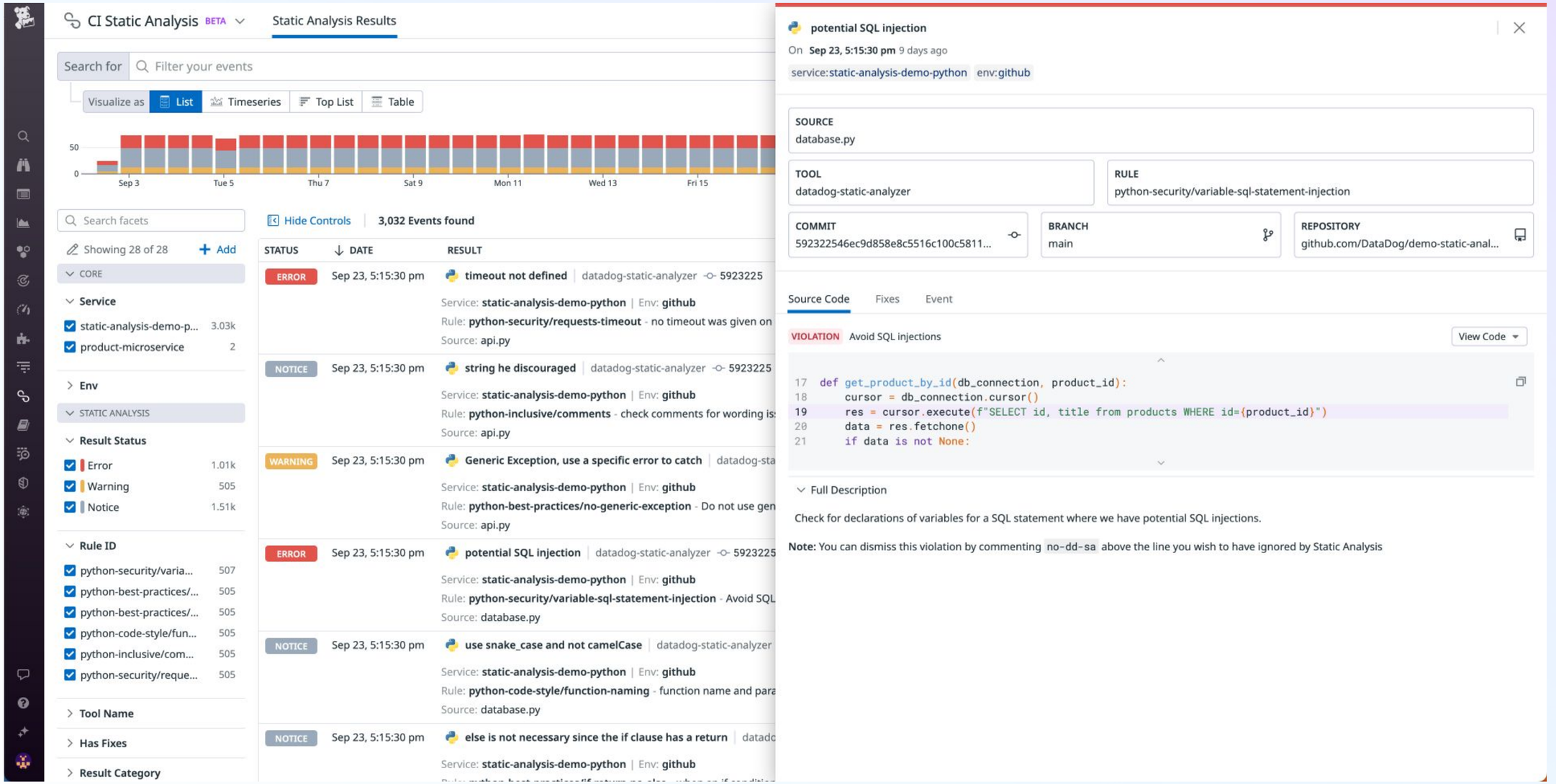
DATADOG

Static Analysis

Detect bad code before it causes an incident or potential outage



Static Analysis



Measure & Accelerate Software Delivery

Establish performance baselines and track progress

Identify baselines from pre-production to production

Set goals & define KPIs for software delivery

Track and prove results across the organization

Software Delivery Performance Measures

- Deployment frequency
- Change lead time
- Change failure rate
- Failed deployment recovery time (MTTR)

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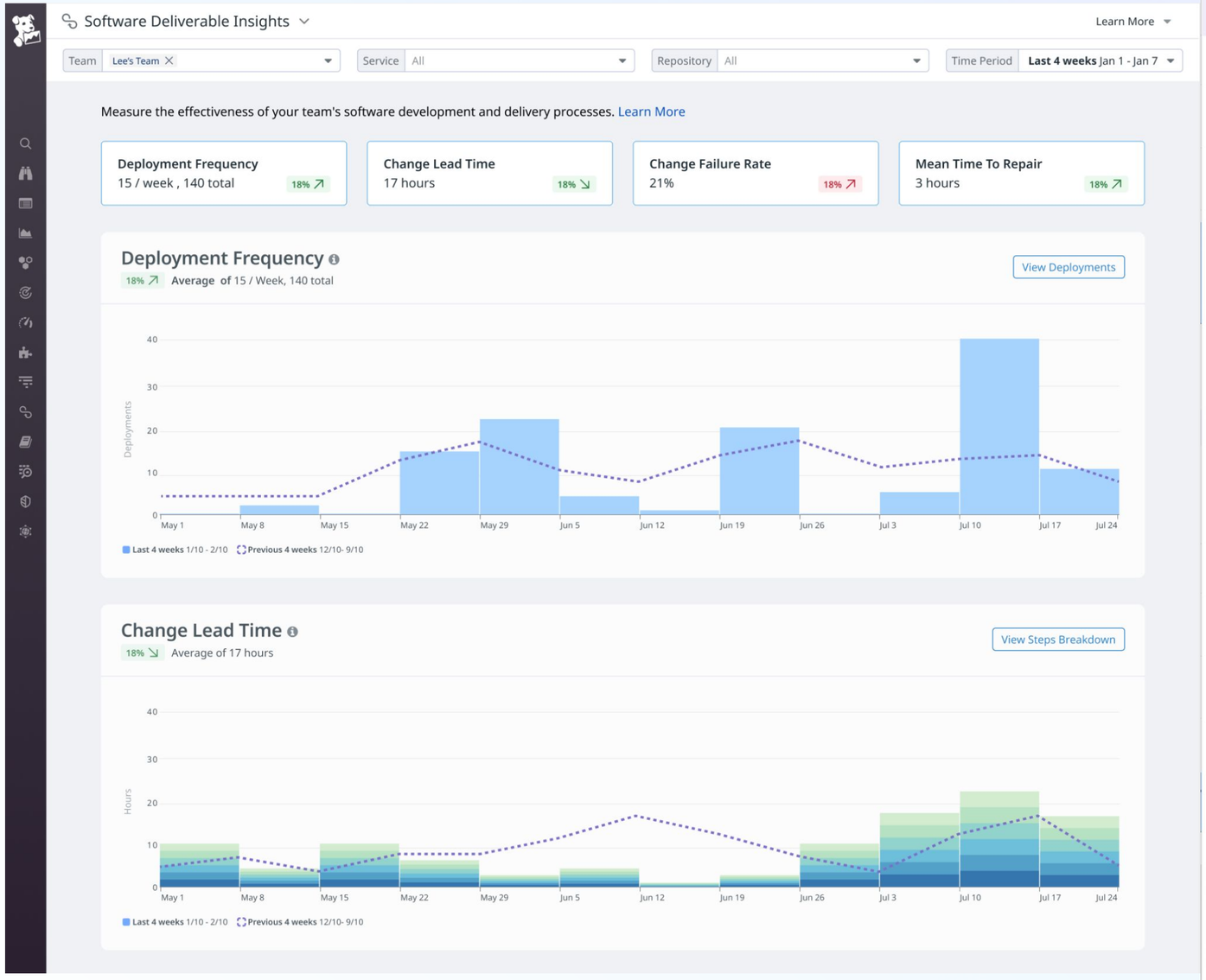
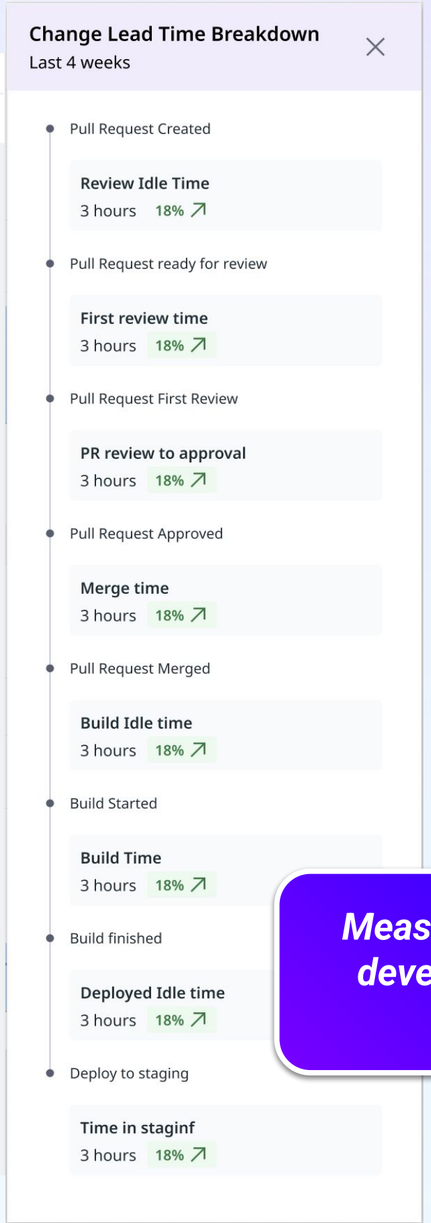
DATADOG

DORA Metrics

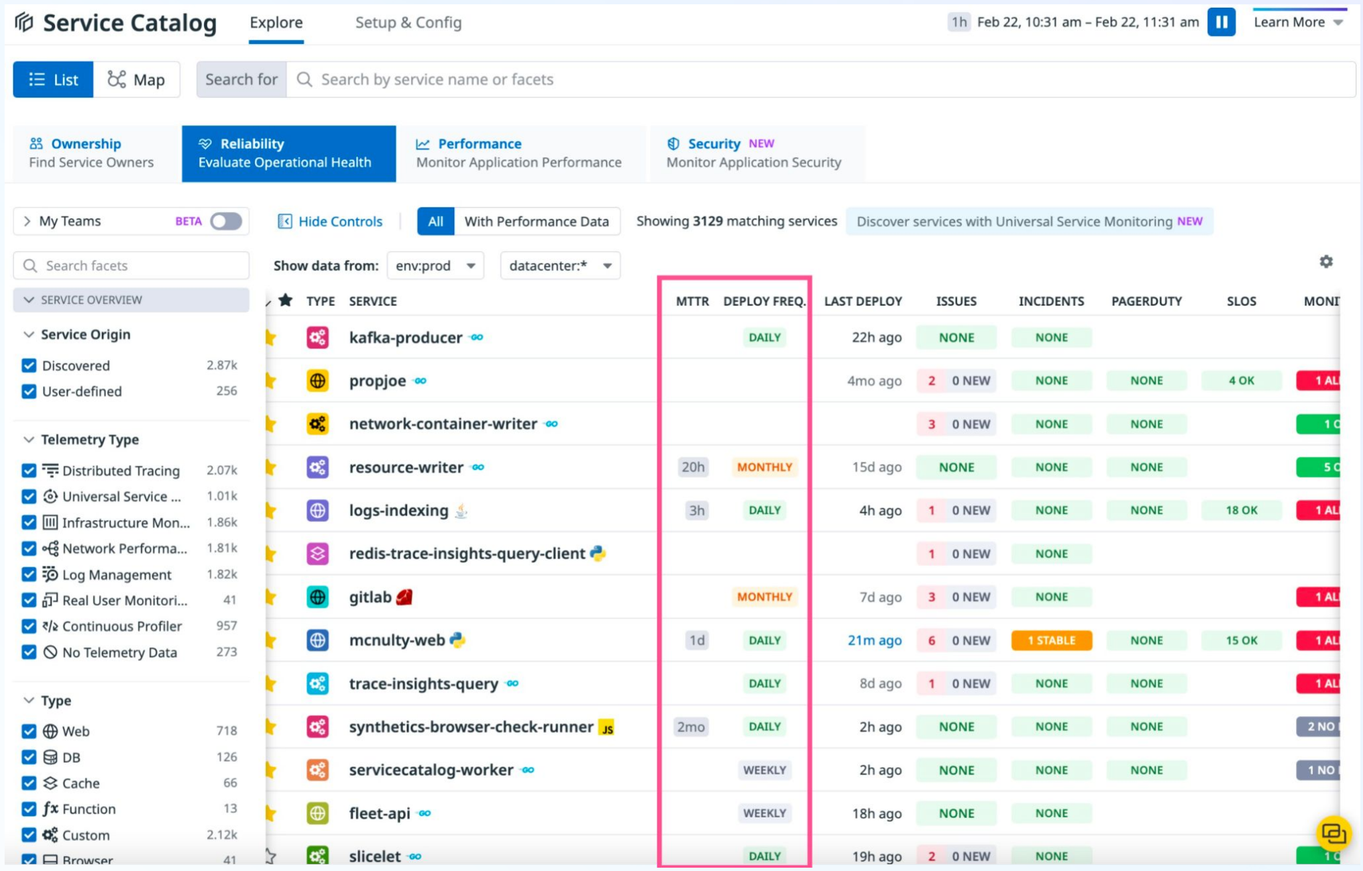




Measure & set goals around development velocity with DORA metrics

DORA Metrics

- Additional data source(s) to derive DORA Metrics
- Will be able to tie DORA metrics to product development areas easier: repositories, branches, pipelines, test services, teams



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Performance level	Deployment frequency	Change lead time	Change failure rate	Failed deployment recovery time	% of respondents
Elite	On demand	Less than one day	5%	Less than one hour	18%
High	Between once per day and once per week	Between one day and one week	10%	Less than one day	31%
Medium	Between once per week and once per month	Between one week and one month	15%	Between one day and one week	33%
Low	Between once per week and once per month	Between one week and one month	64%	Between one month and six months	17%

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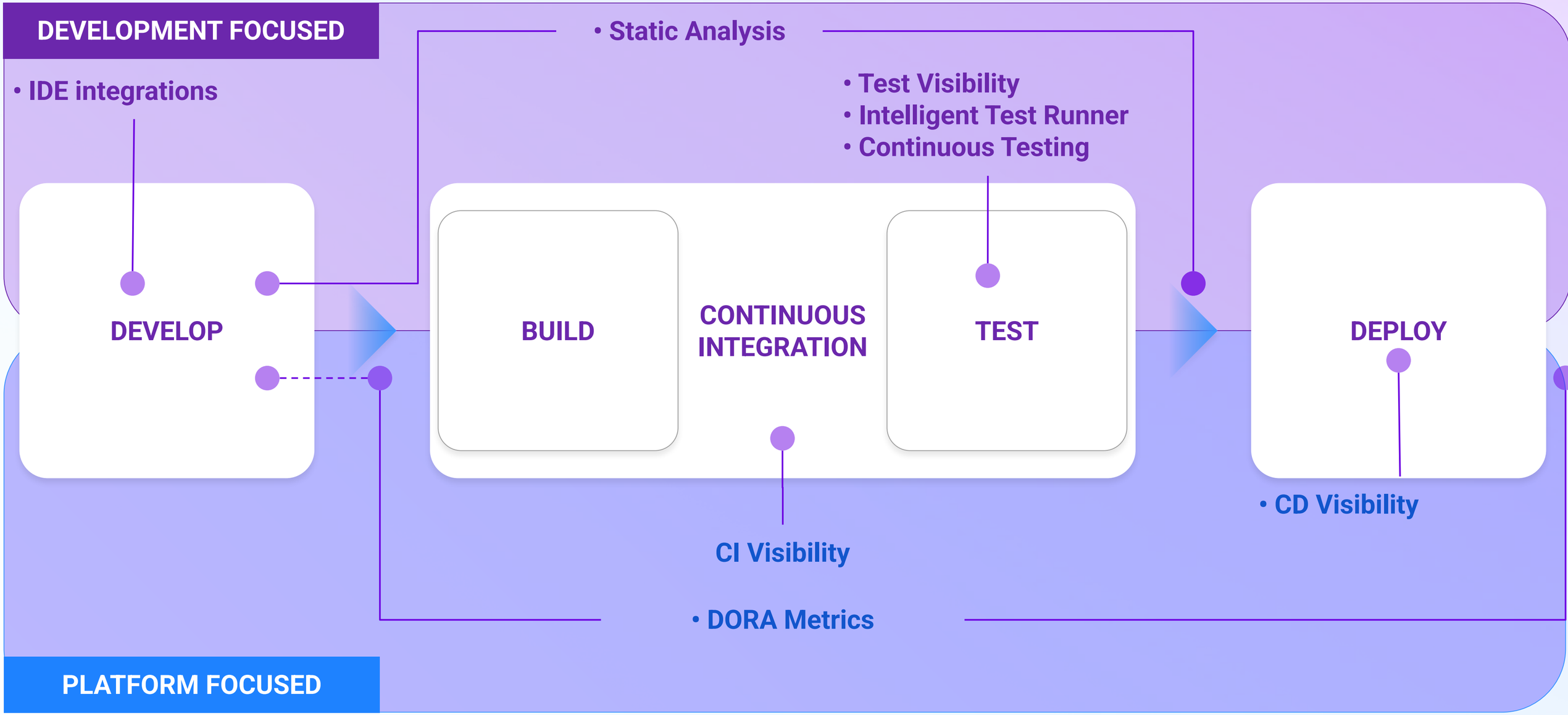
Visibility across your SDLC, in one place



DATADOG

MULTINATIONAL FAST FOOD CORP

Food & Beverages

Global

Tens of Millions Daily Customers

BUSINESS DRIVERS

This is one of the largest multinational fast food chains in the world, operating digitally and in tens of thousands of locations worldwide.

Delivering fast, easy, and performant experience to tens of millions of daily customers and crew members is critical to the success of their business. The company needed a way to optimize its CI/CD process and ensure that issues are caught quicker and new features are released faster.

DATADOG CAPABILITIES

- **CI Pipeline Visibility**
- Log Management
- **CI Test Visibility**
- Containers

ANONYMIZED

CHALLENGE

Limited observability hindering releases Lack of ability to detect CI performance issues such as regressions in Wall Time

Tool Sprawl Different teams working with different CI tools and standards led to context switching and poor collaboration

Slow, manual investigations Process to identify exact problem area and root cause is time-consuming, delaying releases

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DATADOG CAPABILITIES

- **CI Pipeline Visibility**
- Log Management
- **CI Test Visibility**
- Containers

ANONYMIZED

SOLUTION

Deep CI observability This company automatically tracks key metrics indicating the quality of upcoming releases as they proceed through the pipeline and testing process

Unified platform for all Engineering and business stakeholders can track performance of various CI tools in a single view

Fast root cause analysis Engineers are now seamlessly correlating pipeline and test errors and bottlenecks with their associated log and cloud infrastructure data

DATADOG

MULTINATIONAL
FAST FOOD CORP

“Datadog’s unique CI/CD and test visibility solutions brought production-level observability into our pre-prod environments for the first time in the organization’s history”

ANONYMIZED

Food & Beverages

Global

Tens of Millions
Daily Customers

RESULTS

This company’s engineers at all skill levels can see multiple CI tool readouts in a single view, catch performance regressions and test failures in the bud, and accelerate release cycle & code quality for new features and services

CI tool consolidation

All teams have shared context and visibility into various CI tools

Unified platform

Seamless correlations between pipeline and test regressions to relevant logs and metrics

~200 committers

are monitoring their CI pipelines and test to ensure frequent, reliable releases

“Teams with shorter code review times have 50% better software delivery performance.”

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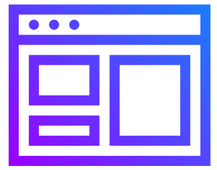
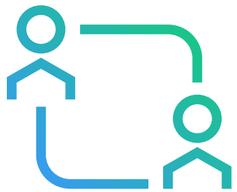
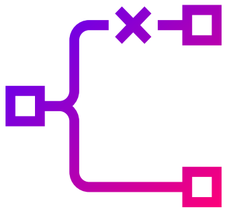
To recap:



Tooling consolidation & automation

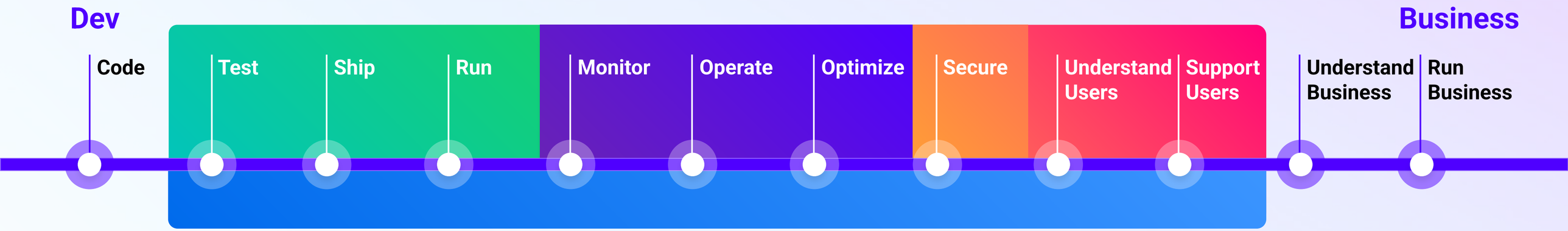


Developer experience & productivity



Code & release quality

Measure & accelerate software delivery



Software Delivery

- CI Pipeline Visibility
- CD Visibility
- CI Test Visibility
- IDE Integrations
- Intelligent Test Runner
- DORA metrics

Monitor & Operate

- Infra Monitoring
- Network Monitoring
- APM
- Synthetics
- Log Mgmt
- Universal Service Monitoring
- Observability Pipelines

Optimize

- Continuous Profiler
- Database Monitoring
- Data Streams Monitoring
- Cloud Cost Mgmt

Secure

- Cloud Security Mgmt
- Application Security Mgmt
- Cloud SIEM
- Software Composition Analysis
- Sensitive Data Scanner

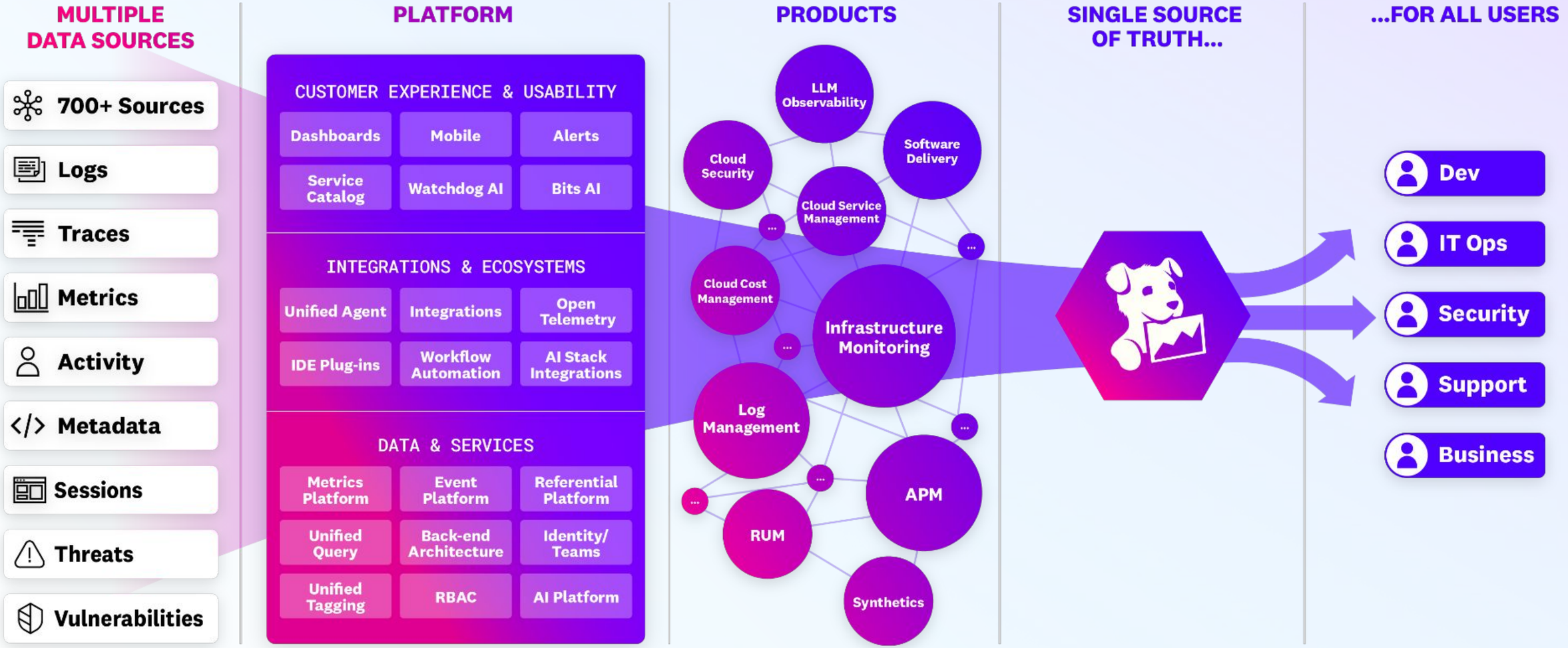
Analyze

- RUM
- RUM Heatmap/ Clickmap/ Scrollmap
- Mobile App Testing
- Session Replay

Cloud Service Management

- Incident Management
- Case Management
- Workflow Automation
- App Builder
- Service Catalog
- Resource Catalog

Breaking down silos with our unified platform



DATADOG

Thank you

Continue your Datadog learning journey!

Booth #710

SEC210 - You can only secure what you can see: how observability empowers security
Thur 4/11 9:45-10:30 am

OPS206 - Use Gemini to improve productivity while using Datadog

Thur 4/11 10:15-11:00 am

DATADOG