Quality Transformation

Challenges and Opportunities

Adapting and Transforming Quality Assurance and Analysis Practices

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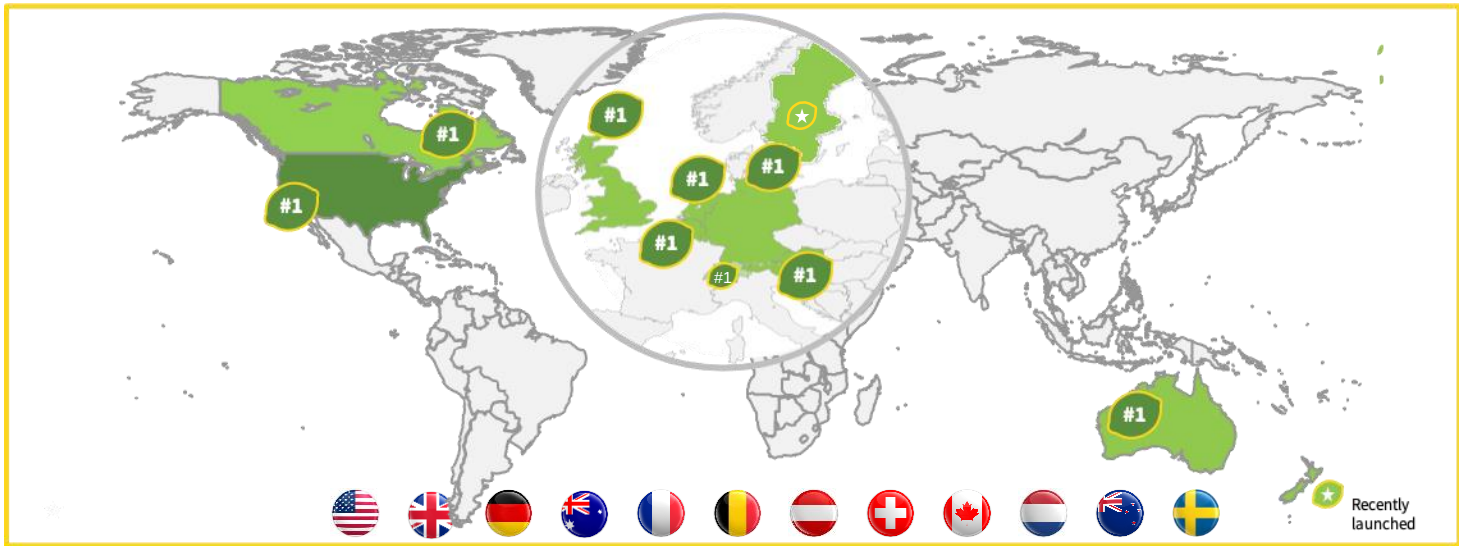
TestCon Europe 2019

Vilnius, 16.10.2019

THE LARGEST AND ONLY GLOBAL PLAYER

Expanding market share across all regions!



67 M
MEALS SERVED IN Q2 2019

€437 M
REVENUE FOR Q2 2019

37%
REVENUE GROWTH FOR Q2 2019

5.000+
EMPLOYEES WORLDWIDE

1993

Lack of a practical working definition of what "quality" means for software

Lack of quality measurements

Lack of understanding by project management that quality is on target

Inadequate use of reviews and inspections

Inadequate defect prevention

Insufficient or careless testing

Excessive scheduling pressure leading to unwise attempts to short-cut quality control

Unstable and ambiguous user requirements

Historical Attention-Span Deficit Disorder

Where does quality begin?

Design and build something close
to perfect and test it mercilessly

… or build something fast
and deal with quality at the end

Quality is managed from the start evaluated and improved up to
and beyond delivery

OPPORTUNITY: SPEED TO MARKET

Improving key capabilities of software development and deployment performance

	High Performers	Low Performers
Delivery Frequency	>1x / day	1x month
Lead Time to Change	< 1 hr	1x week - 1x / month
MTTR	< 1 hr	1 day – 1 week
Change Failure Rate	< 15%	31-45%

up to 100%

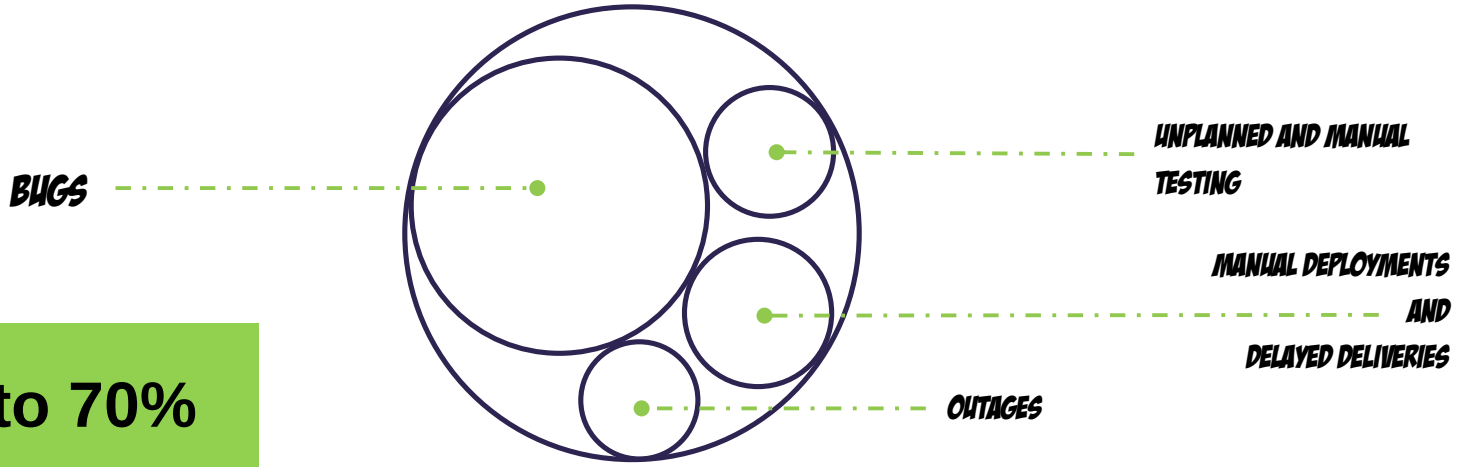
IMPROVEMENT

FASTER DELIVERIES OF PRODUCTS AND SERVICES

GETTING FEATURES INTO THE HANDS OF CUSTOMERS FASTER

From: DORA State of DevOps-2018 and Forsgren, N. et al, **Accelerate,** 2018

OPPORTUNITY: OPERATIONAL COSTS IN PERSPECTIVE



up to 70%

DEVELOPMENT TIME SPENT ON ACTIVITIES NOT RELATED TO NEW WORK

Four Horsemen of the SDLC Apocalypse

From: Forsgren, et al, **Accelerate,** 2018

Defining a Scope for the Transformation

Testing

Adapt testing strategies to event-based microservices

SDLC

Find and eliminate inefficiencies and technical debt in processes

Analysis

Adapt tooling and measurements to meet new challenges

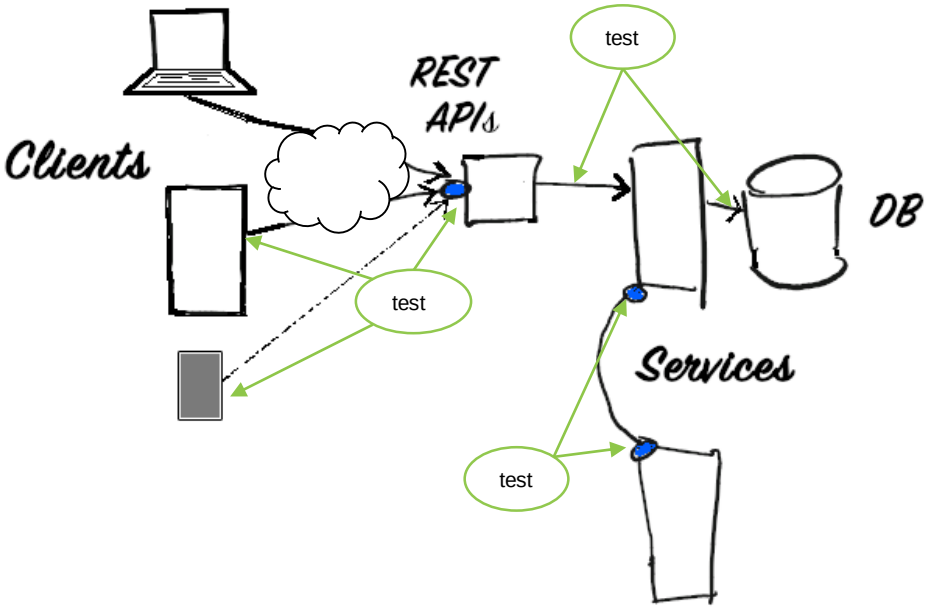
Reporting

On demand reports for development as well as production

Monitoring

Proactively find and eliminate bugs, feature failures in production

REST APIS

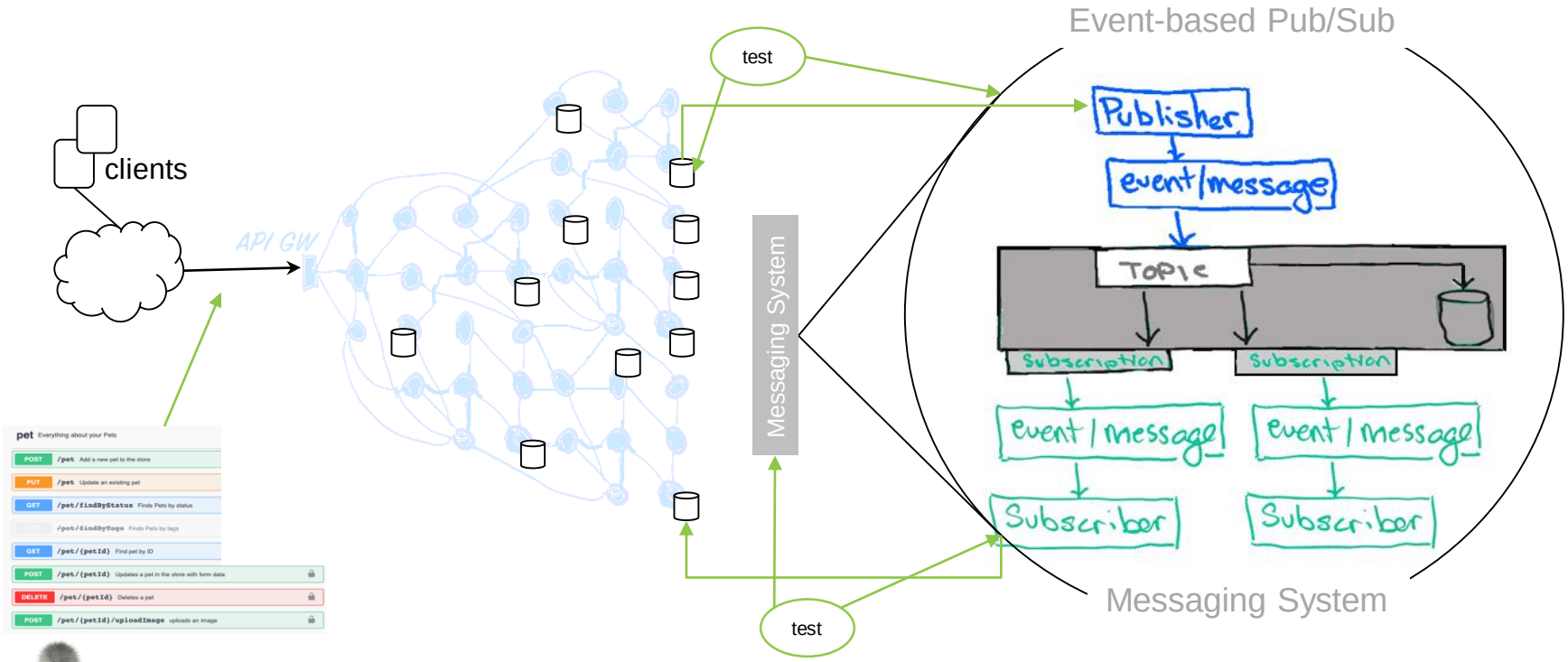


Macro services
Microliths

pet Everything about your Pets — http://swagger.io

POST	/pet	Add a new pet to the store
PUT	/pet	Update an existing pet
GET	/pet/findByStatus	Finds Pets by status
GET	~~/pet/findByTags~~	Finds Pets by tags
GET	/pet/{petId}	Find pet by ID
POST	/pet/{petId}	Updates a pet in the store with form data
DELETE	/pet/{petId}	Deletes a pet
POST	/pet/{petId}/uploadImage	uploads an image

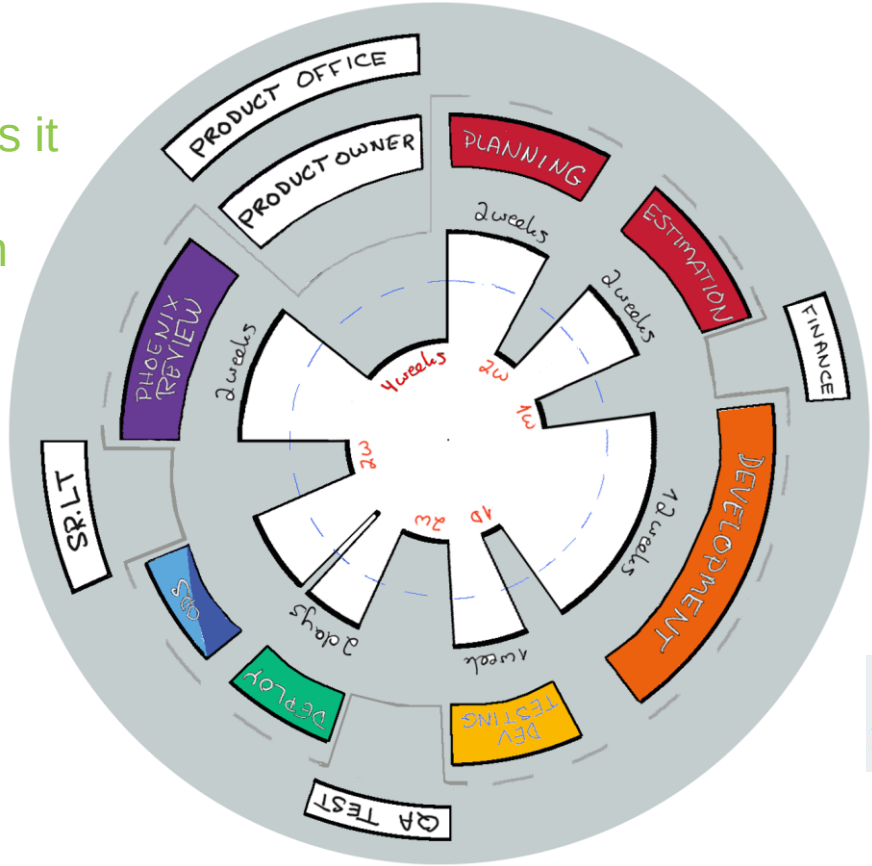
Challenge: Microservices and Distributed Data



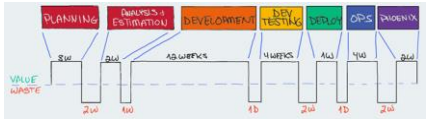
Every change to the state of an application is contained in an event. Because we can determine the state of the app at any point in time we have an effective, non-intrusive test. Events can be replayed against configured CBs and can act as ad hoc performance testing

PROCESSES

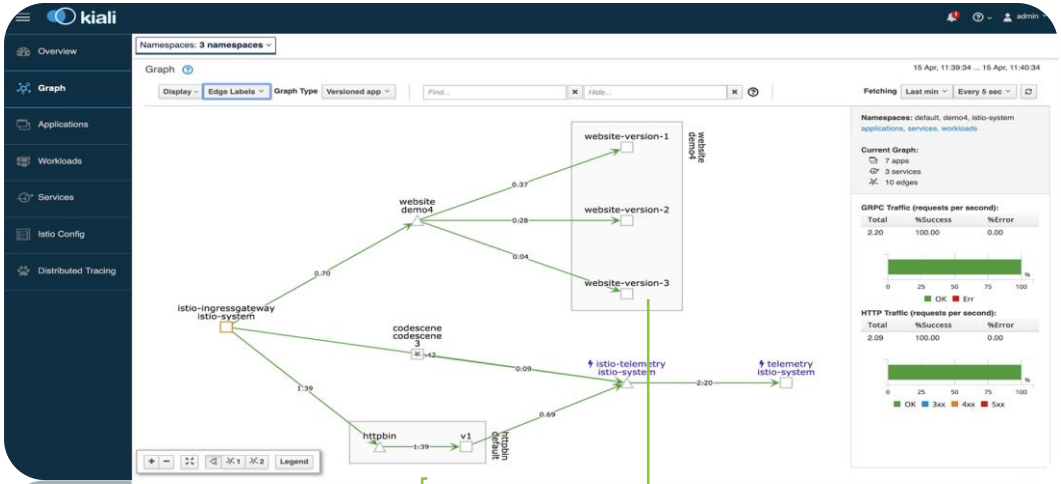
How long does it take to get feedback from production?

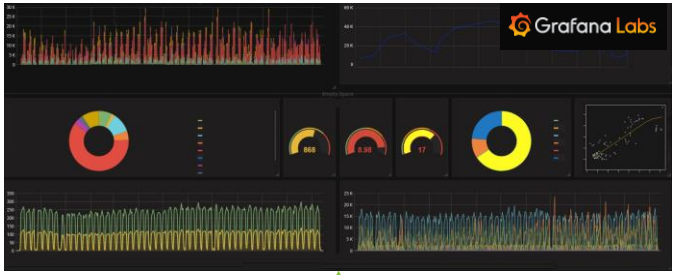


How long does it take to get a feature into production?



TELEMETRY





SYNCHRONOUS EVENTS
OUTBOUND/SENT
INBOUND/SENT

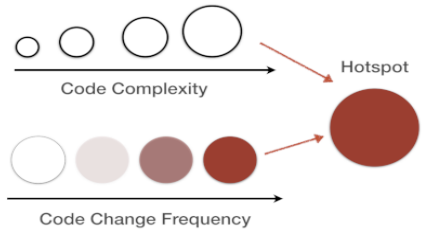
ASYNCHRONOUS EVENTS
OUTBOUND/SENT

APACHE kafka®
A distributed streaming platform

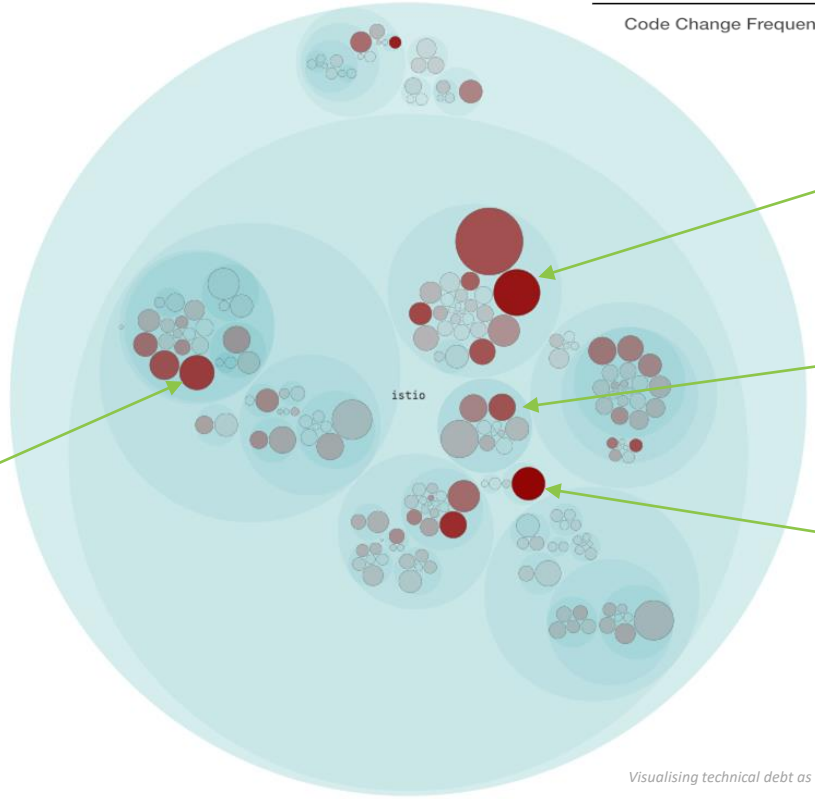
elastic

Kiali

FINDING RISK



Technical debt is
not only
a technical problem



high risk of bugs

refactoring candidates

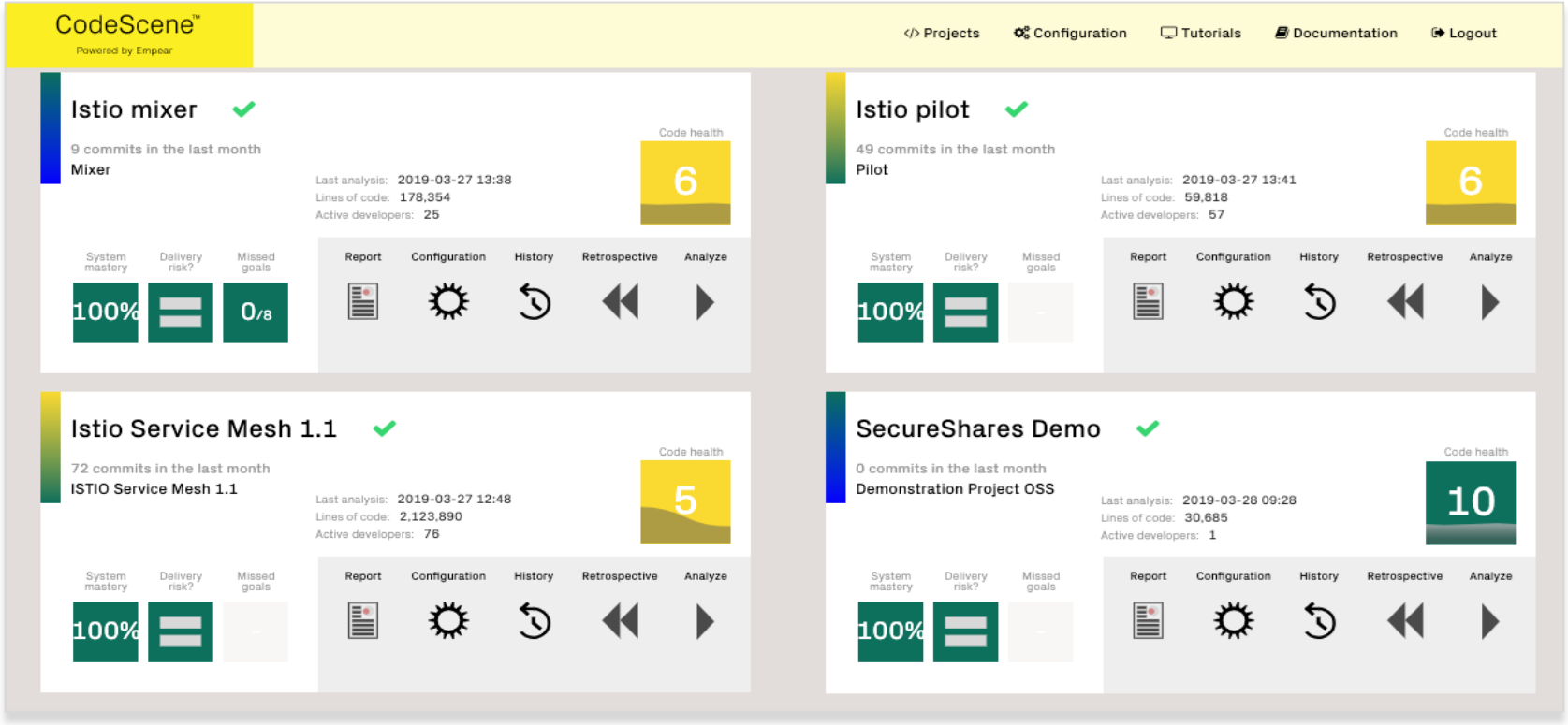
unplanned rework needed

supplementary or exploratory testing required

Visualising technical debt as measured by code complexity and change frequency

QUALITY REPORTING

Testing
SDLC
Analysis
Reporting
Monitoring



REPORTING TRENDS

CodeScene™
Powered by Empear

Mixer: Architectural Code Biomarkers

Code Biomarkers aim to indicate specific properties of the code.

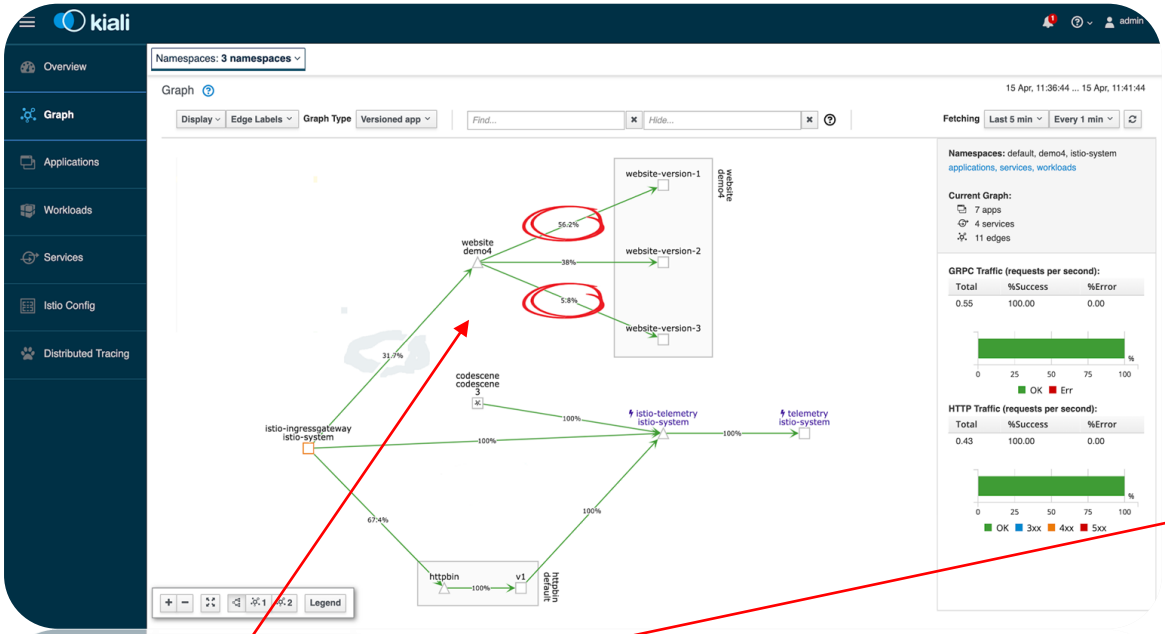
Supervision	File	Status Now	Last Month	Last Year	Details
RF ?	template.gen.go istio/mixer/template/	1	1	3	High Overall Code Complexity Excess Data Declarations Brain Method Detected Low Cohesion Duplicated Function Blocks
RF ?	template.gen.go istio/mixer/template/sample/	3	3	3	High Overall Code Complexity Brain Method Detected Low Cohesion Duplicated Code
SU ?	grpcServer_test.go istio/mixer/pkg/api/	5	5	6	Many Conditionals Brain Method Detected Low Cohesion High Degree of Code Duplication Heavy usage of string arguments
NP ?	template.gen_test.go istio/mixer/template/sample/	6	6	6	Brain Method Detected Low Cohesion Heavy usage of string arguments
NP ?	bag_test.go istio/mixer/pkg/attribute/	6	6	6	Deeply Nested Logic Brain Method Detected Low Cohesion
SU ?	server.go istio/mixer/pkg/server/	6	6	6	Many Conditionals Brain Method Detected
NP ?	expr.go istio/mixer/pkg/lang/ast/	6	6	6	Many Conditionals Deeply Nested Logic Brain Method Detected
NP ?	grpcServer.go istio/mixer/pkg/api/	7	7	8	Deeply Nested Logic Brain Method Detected

Figure 1 Code Biomarkers representing the most volatile, and riskiest code

Codescene from Empear

MONITORING DEPLOYMENTS

Testing
SDLC
Analysis
Reporting
Monitoring




```yaml
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
metadata:
  name: website-virtual-service
spec:
  hosts:
  - "test.k8s-pcconsultants.de"
  gateways:
  - website-gateway
  http:
  - match:
    - uri:
        prefix: /website
    rewrite:
      uri: /
    route:
    - destination:
        host: website
        subset: version-1
      weight: 60
    - destination:
        host: website
        subset: version-2
      weight: 30
    - destination:
        host: website
        subset: version-3
      weight: 10
```

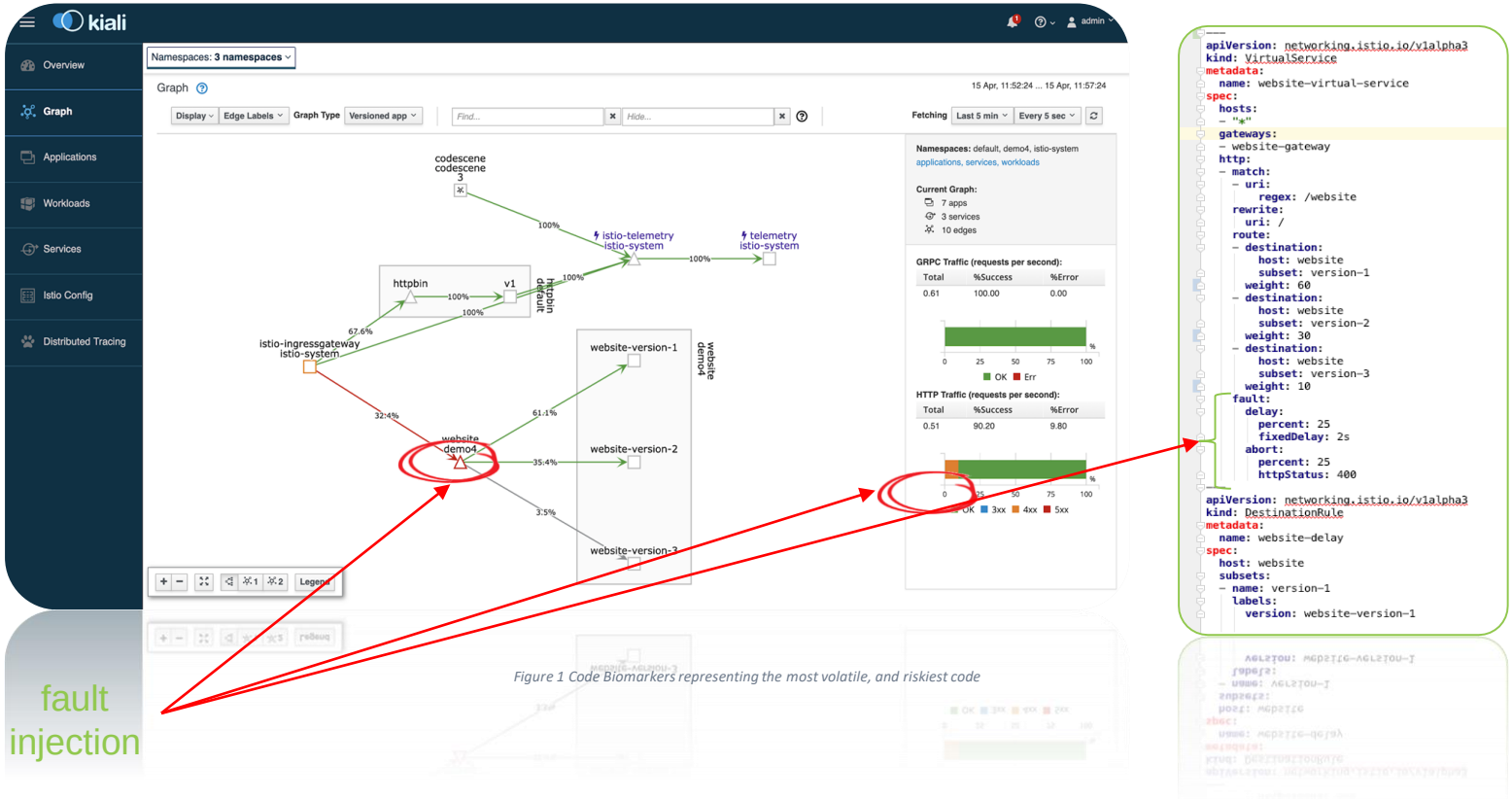
Figure 1 Code Biomarkers representing the most volatile, and riskiest code

canary
deploy

Service Discovery, Logging, Fault Tolerance, Performance Anomalies

MONITORING IN PRODUCTION

Testing
SDLC
Analysis
Reporting
Monitoring



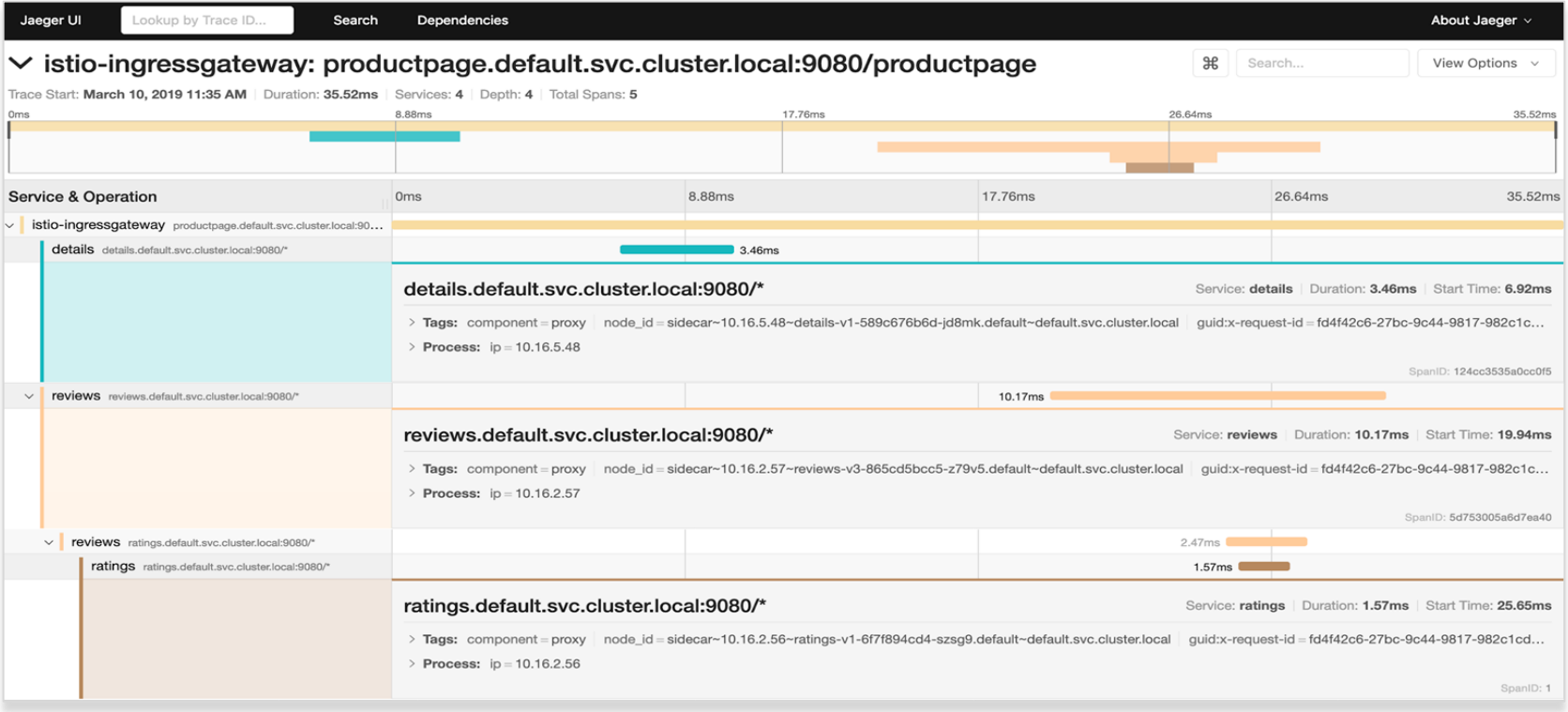

```yaml
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
metadata:
  name: website-virtual-service
spec:
  hosts:
  - "*"
  gateways:
  - website-gateway
  http:
  - match:
    - uri:
        regex: /website
    rewrite:
      uri: /
    route:
    - destination:
        host: website
        subset: version-1
      weight: 60
    - destination:
        host: website
        subset: version-2
      weight: 30
    - destination:
        host: website
        subset: version-3
      weight: 10
    fault:
      delay:
        percent: 25
        fixedDelay: 2s
      abort:
        percent: 25
        httpStatus: 400
---
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: website-delay
spec:
  host: website
  subsets:
  - name: version-1
    labels:
      version: website-version-1
```

Figure 1 Code Biomarkers representing the most volatile, and riskiest code

fault injection

DISTRIBUTED TRACING

Testing
SDLC
Analysis
Reporting
Monitoring



FINAL THOUGHTS

How do these innovative ideas and methodologies help you manage risk?


Thank You!
PETER CARON
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JOIN US!
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ALMONDS
Lamb Ragù Spaghetti

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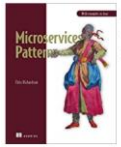
https://medium.com/@Tinder.Engineering/tinders-move-to-kubernetes-cda2a6372f44

https://martinfowler.com/articles/microservice-testing/#testing-integration-diagram



Microservice Patterns:
With examples in Java
by Chris Richardson | 19 Nov 2018

The Tao of Microservices
by Richard Rodger | 31 Dec 2017

Designing Data-Intensive Applications:
The Big Ideas Behind Reliable, Scalable, and Maintainable Systems
Kleppmann, Martin

Production-Ready Microservices
By Susan J. Fowler
Publisher: O'Reilly Media
Release Date: November 2016
Language: English

Building Data Streaming Applications with Apache Kafka
By Manish Kumar, Chanchal Singh
Publisher: Packt Publishing
Release Date: August 2017

Testing Java Microservices
by Soto Bueno, Alex , Jason Porter, et al. | 31 Aug 2018

Software Design X-Rays: Fix Technical Debt with Behavioral Code Analysis
Tornhill, Adam, O'Reilly UK Ltd.

Kafka: The Definitive Guide
By Gwen Shapira, Neha Narkhede, Todd Palino
Publisher: O'Reilly Media
Release Date: August 2017

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