

KubeCon Europe 2019

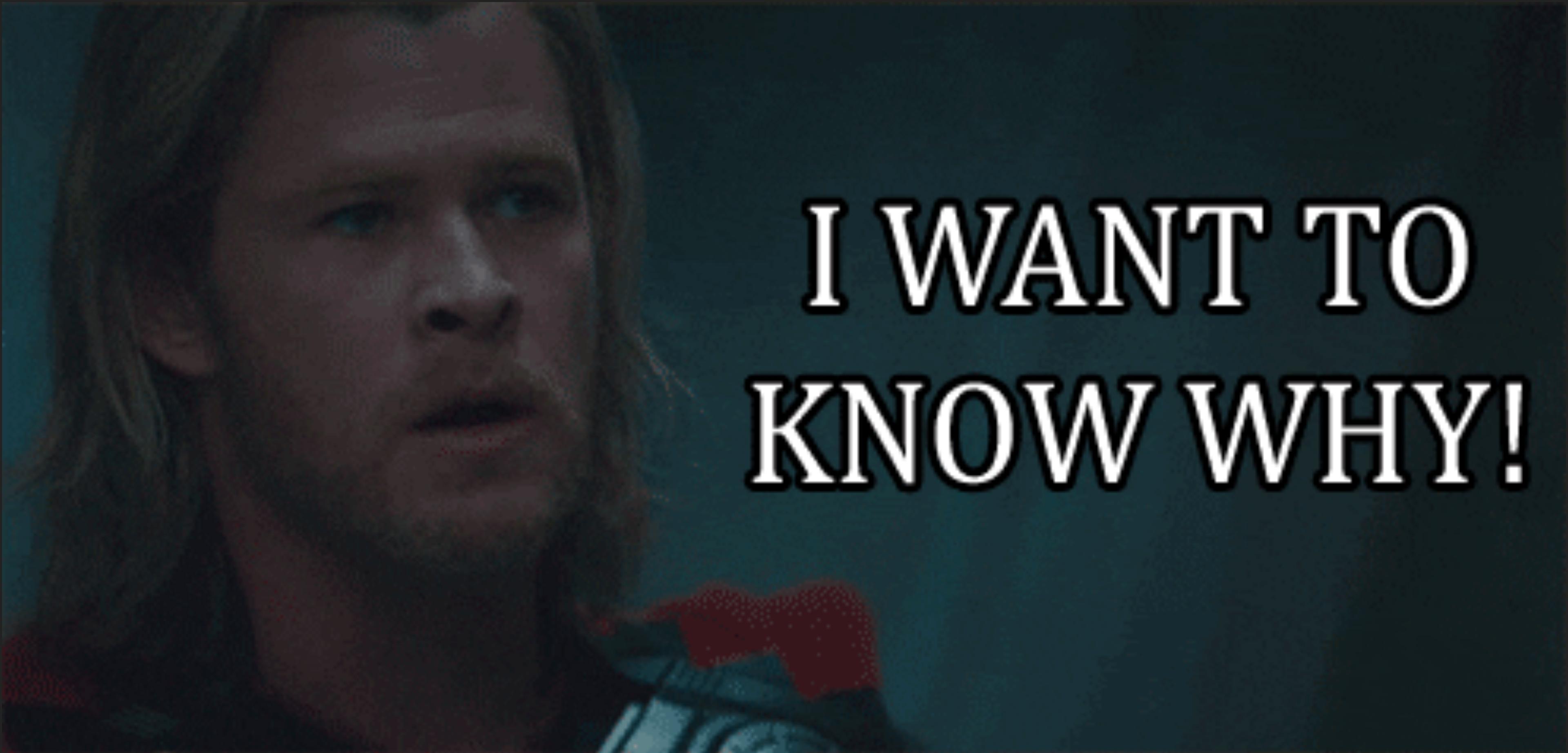
JUNE 2019 - KUBERNETES USER GROUP

Benvinguts! Keep Cloud Native



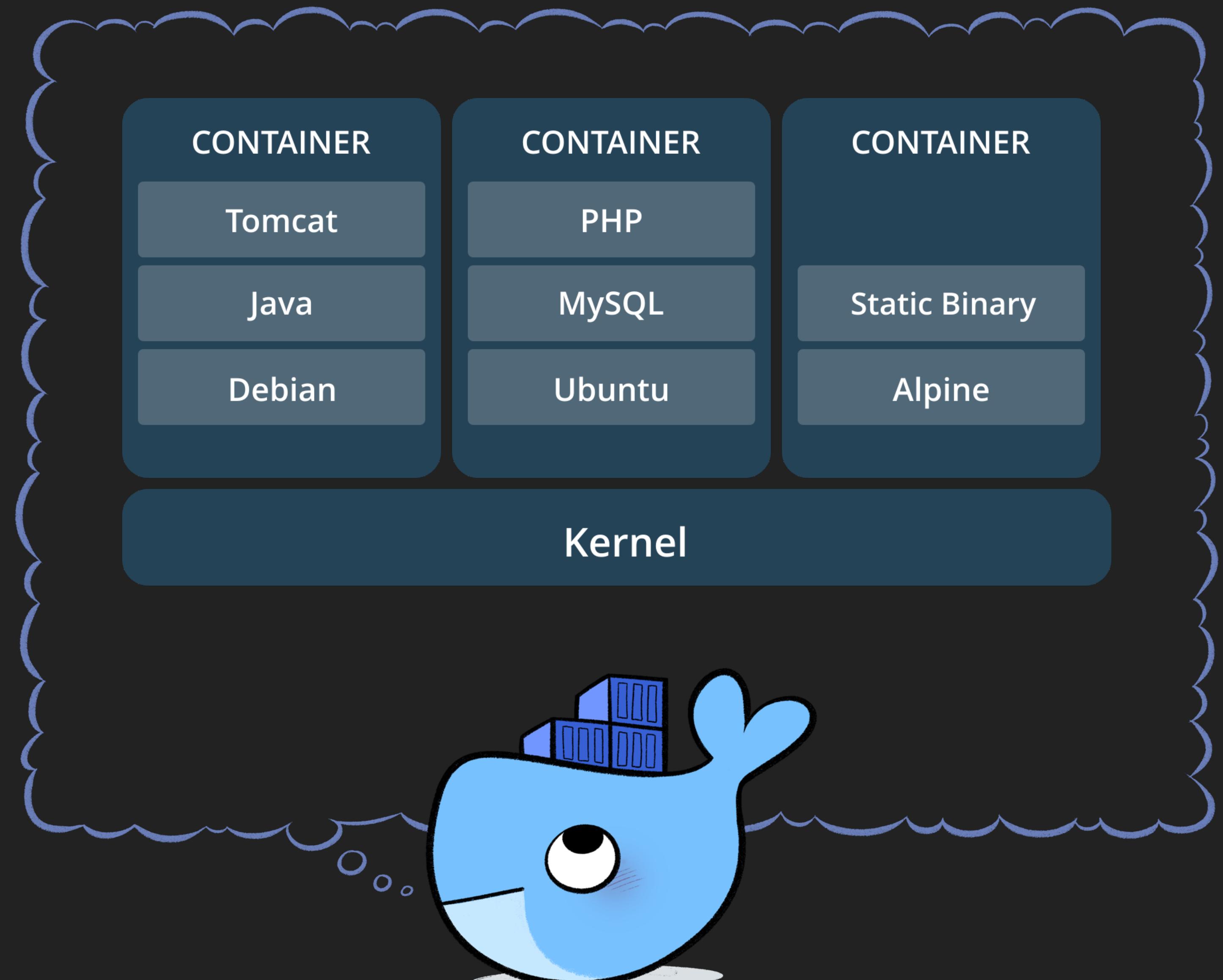
KubeCon Europe 2019 was ...

- ▶ 8000 people
- ▶ 331 talks
- ▶ 150 sponore showcase
- ▶ 49 viewed talks
- ▶ 7 beers
- ▶ 3 days



I WANT TO
KNOW WHY!

The result from adopting container, is that application can be deployed or undeployed faster, start and stop faster, change to another “image” faster, process and do many things faster.



Alibaba Sigma



Amazon Apollo



Apache Mesos



Baidu Matrix

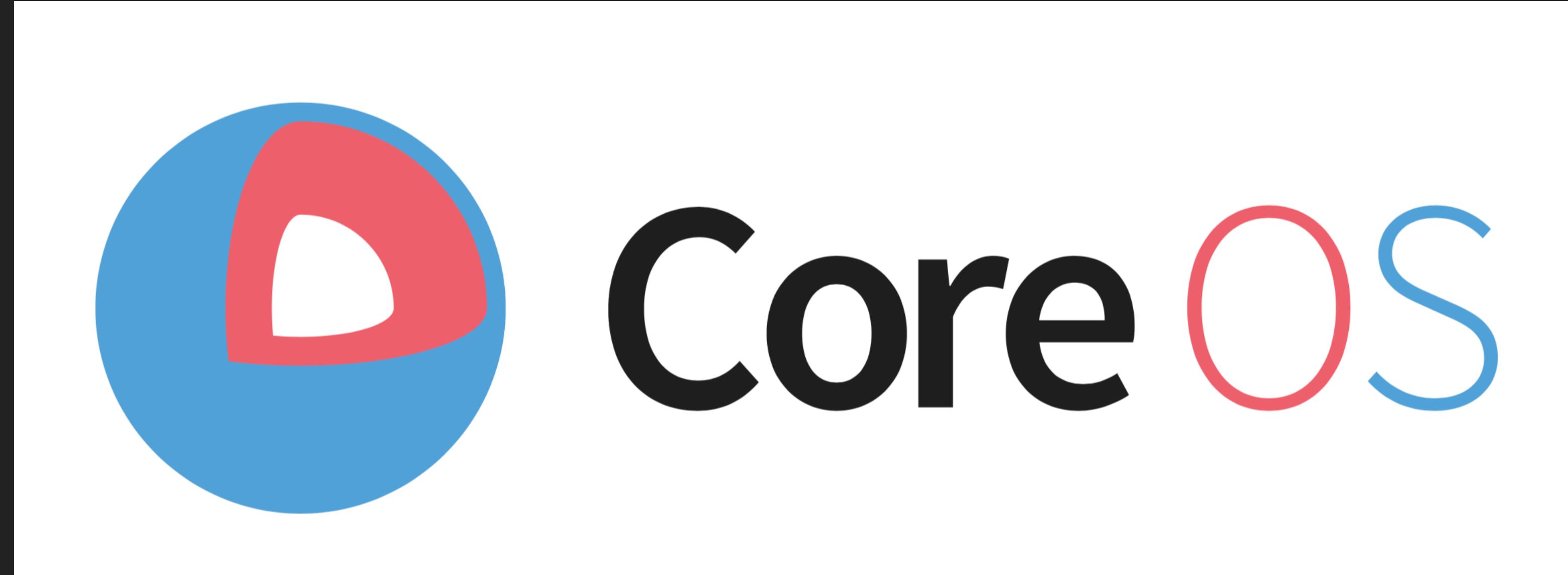


Cloud Foundry Garden & Diego

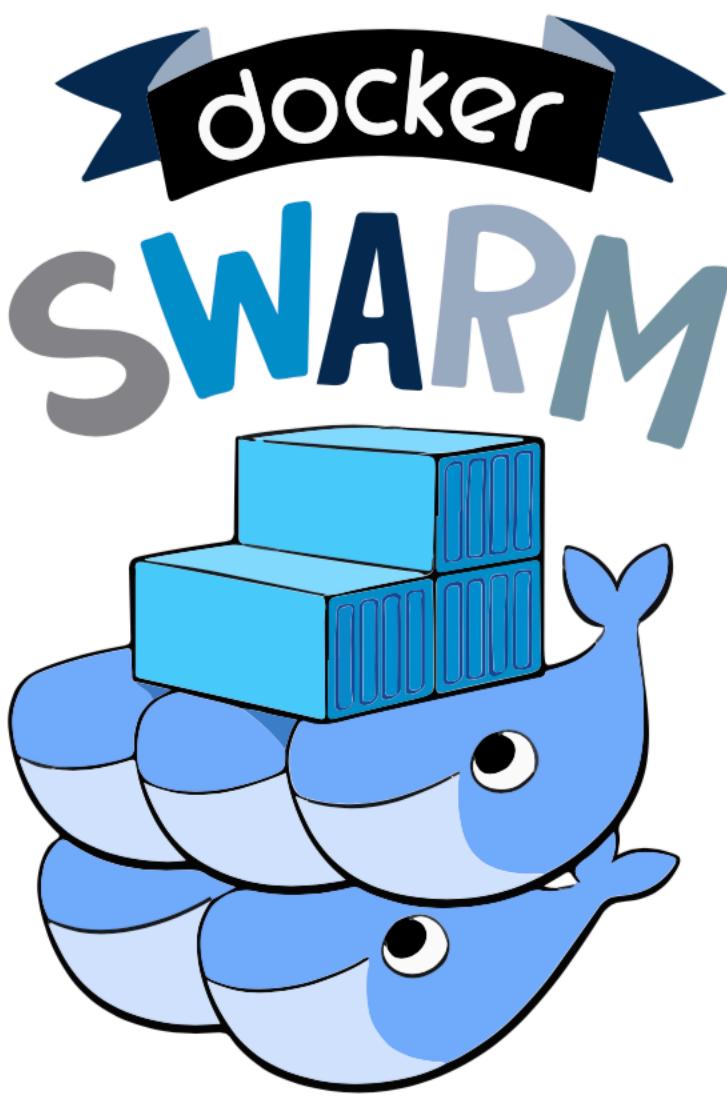


CLOUD **FOUNDRY**

CoreOS Fleet



Docker Swarm



Facebook Tupperware



Google Borg & Omega



HashiCorp Nomad



IBM Platform Symphony



Joyent Triton



Lyft v3 Infra



Microsoft Service Fabric



Netflix Titus

A large, bold, red "NETFLIX" logo centered on a white rectangular background. The letters are slightly slanted to the right.

Rancher Cattle



Red Hat OpenShift v2 Broker



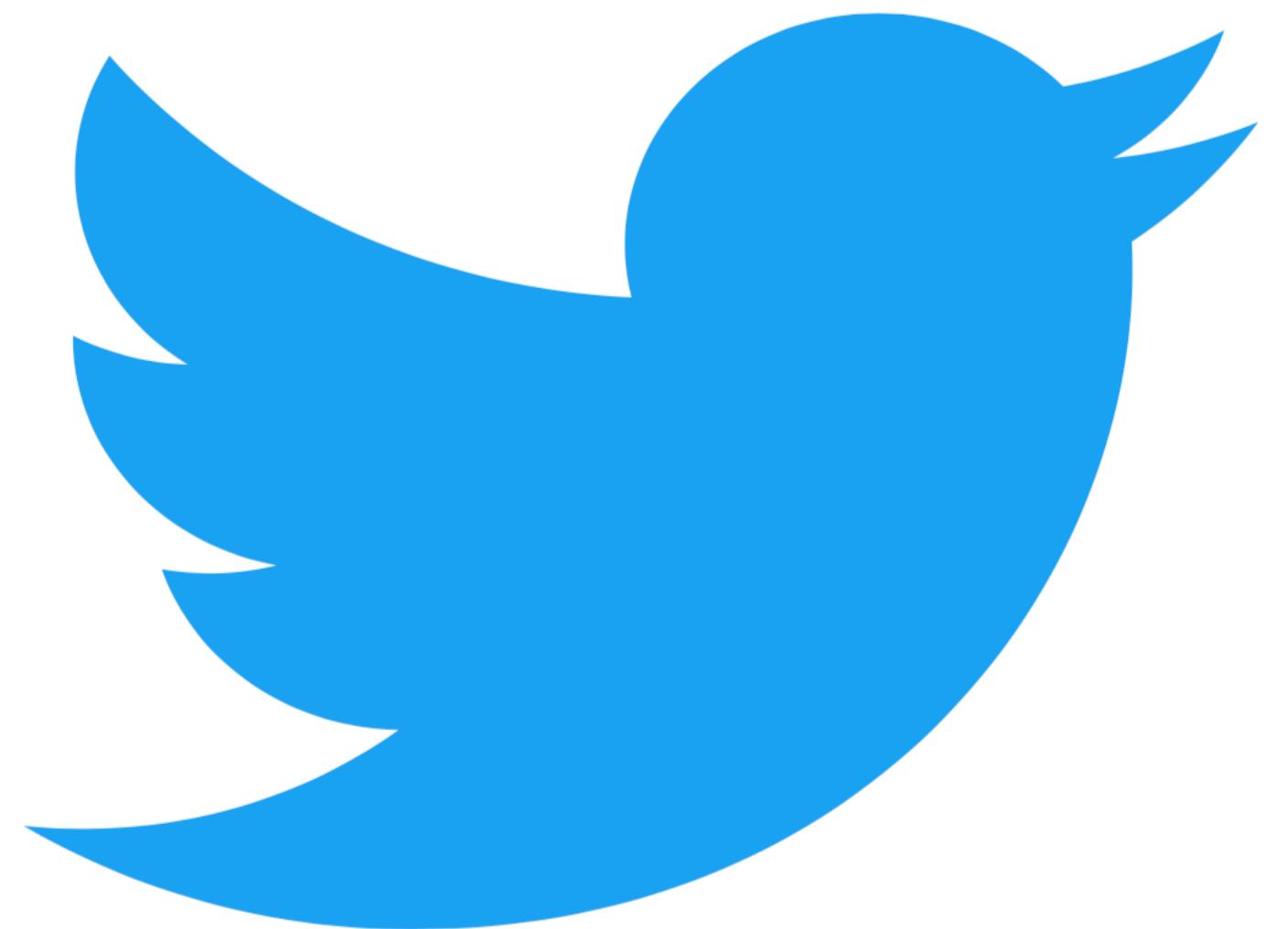
Spotify Helios



Tencent Gaia



Twitter Aurora



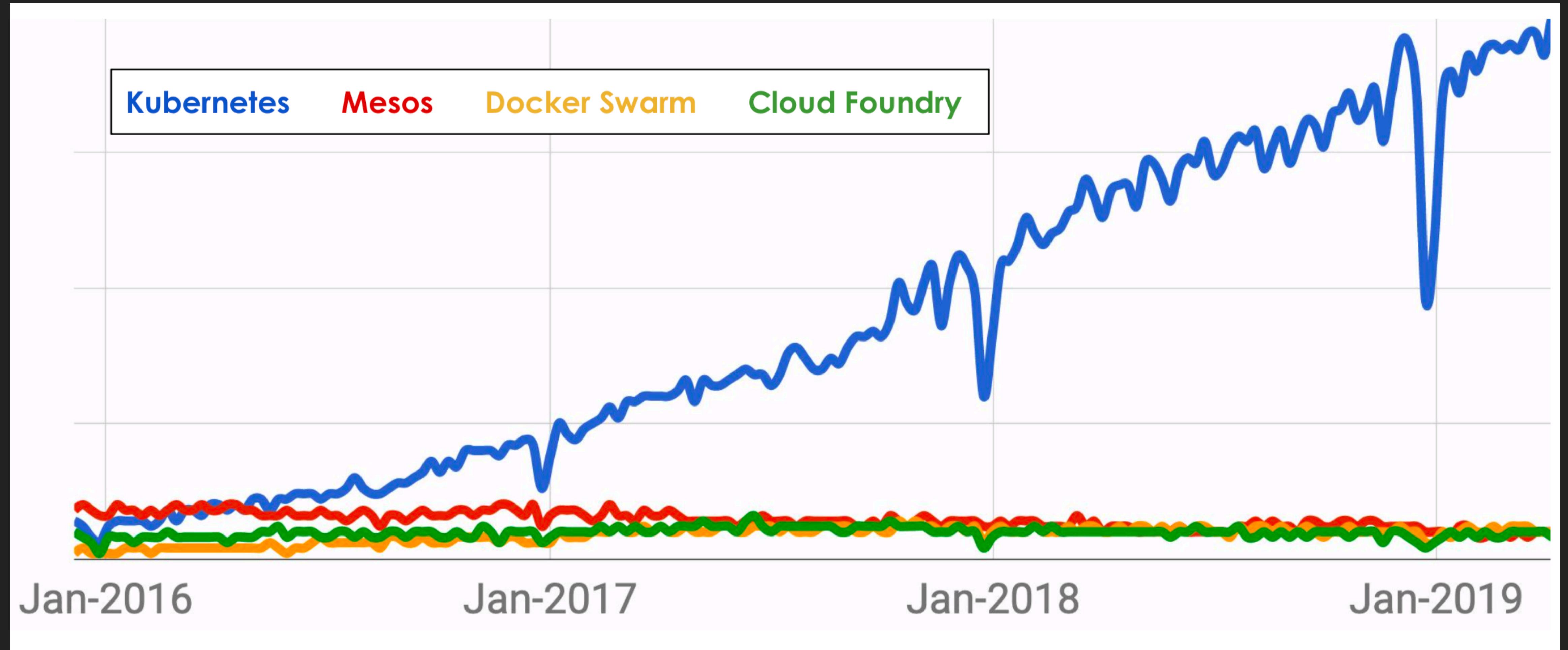
Uber Peloton

The Uber logo, consisting of the word "uber" in a lowercase, sans-serif font. The letters are black, set against a white rectangular background which is itself centered on a dark gray background.

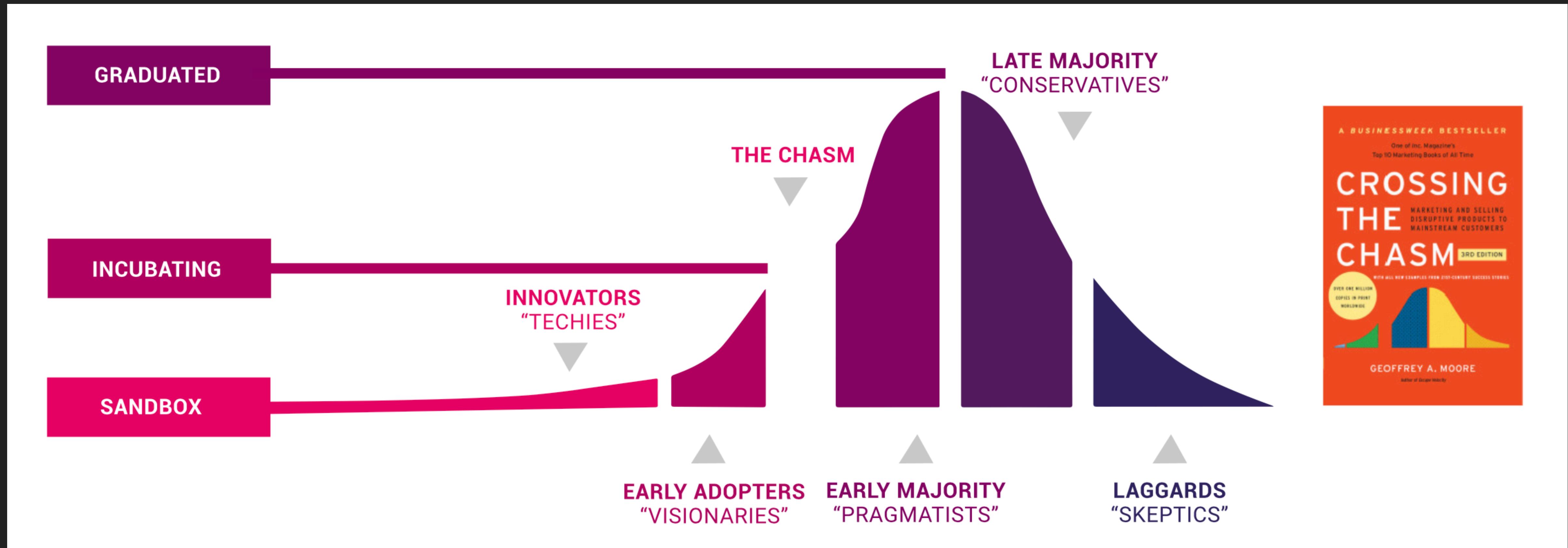
- ▶ 2014: Google Introduces Kubernetes
- ▶ mid-2014: Google introduced Kubernetes as an open source version of Borg
- ▶ June 7: Initial release - first github commit for Kubernetes
- ▶ July 10: Microsoft, RedHat, IBM, Docker joins the Kubernetes community.

- ▶ 2015: The year of Kube v1.0 & CNCF
- ▶ July 21: Kubernetes v1.0 gets released. Along with the release, Google partnered with the Linux Foundation to form the Cloud Native Computing Foundation (CNCF). The CNCF aims to build sustainable ecosystems and to foster a community around a constellation of high-quality projects that orchestrate containers as part of a microservices architecture.
- ▶ November 3: The Kubernetes ecosystem continues to grow! Companies who joined: Deis, OpenShift, Huawei, and Gondor.
- ▶ November 9: Kubernetes 1.1 brings major performance upgrades, improved tooling, and new features that make applications even easier to build and deploy.
- ▶ November 9-11: KubeCon 2015 is the first inaugural community Kubernetes conference in San Francisco. Its goal was to deliver expert technical talks designed to spark creativity and promote Kubernetes education.

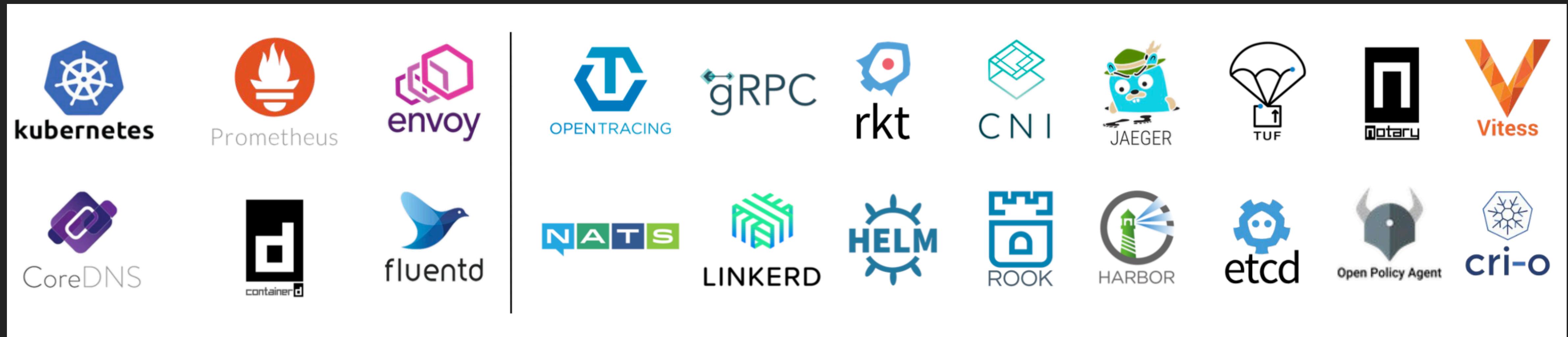
K8S USER GROUP



CNCF : Project Services and Maturity Levels



CNCF Hosted Projects



KubeCon Europe 2019

- ▶ Kubernetes
- ▶ Service Mesh
- ▶ Storage
- ▶ Monitoring + Tracing
- ▶ Machine Learning + Data
- ▶ Sponsor showcase

2.66 Million – Cheryl Hung, Director of Ecosystem, Cloud Native Computing Foundation

2.66 million contributions

56,214 contributors

4 | © 2019 Cloud Native Computing Foundation

@oicheryl

KubeCon | CloudNativeCon
Europe 2019

► <https://www.youtube.com/watch?v=w62T1SN4g6Y>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

Sandbox: OpenEBS

KubeCon CloudNativeCon
Europe 2019

OpenEBS enables Container Attached Storage using Kubernetes itself as the substrate for storage management

Bryan Liles, Senior Staff Engineer, VMware

KubeCon CloudNativeCon
Europe 2019

- ▶ <https://www.youtube.com/watch?v=vdxcaR3I2ic>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

The image consists of two main parts. On the left is a white presentation slide with a yellow-to-red gradient header. The header text reads "Incubating: Linkerd". In the top right corner of the slide are the logos for KubeCon and CloudNativeCon Europe 2019. Below the header, there is a green and blue stylized logo of a mesh or grid. To its right, text reads: "Linkerd is a lightweight service mesh that enhances your application's observability, reliability, and security... ... without code changes!" Below this text are four small circular icons: a blue hexagon with a white ship wheel, an orange hexagon with a white flame, a black circle with a white letter "R", and a light blue hexagon with a white owl. On the right side of the image is a video frame showing a man with glasses and a purple shirt speaking on stage. He is gesturing with his hands. The background of the video frame is a green and blue abstract pattern. At the bottom of the slide and video frame, there is a dark grey footer bar with the same KubeCon and CloudNativeCon logos and the text "Europe 2019".

Incubating: Linkerd

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Europe 2019

Linkerd is a lightweight service mesh that enhances your application's observability, reliability, and security...
... without code changes!

KubeCon | CloudNativeCon
Europe 2019

► <https://www.youtube.com/watch?v=vdxcaR3I2ic>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

Incubating: Helm

HELM

Helm v3.0.0-alpha.1

- Tiller removal
- Release names are scoped to a namespace
- Validate chart values
- Library charts

KubeCon CloudNativeCon
Europe 2019

KubeCon CloudNativeCon
Europe 2019

► <https://www.youtube.com/watch?v=vdxcaR3I2ic>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

The slide has a decorative background with orange and red foliage at the top. In the top right corner, there are logos for KubeCon and CloudNativeCon Europe 2019. On the left side, the Harbor logo (a lighthouse icon) and the word "HARBOR™" are displayed. Below the logo, a text block describes Harbor as an open source Cloud Native registry. On the right side, there is a photograph of Bryan Liles, a Black man wearing glasses and a purple checkered shirt, standing on stage. At the bottom right, the same KubeCon and CloudNativeCon logos are present.

Incubating: Harbor

HARBOR™

Harbor is an open source Cloud Native registry that enables organizations to enforce policy and compliance for container images.

KubeCon | CloudNativeCon
Europe 2019

KubeCon | CloudNativeCon
Europe 2019

- ▶ <https://www.youtube.com/watch?v=vdxcaR3I2ic>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

Incubating: Rook

KubeCon CloudNativeCon
Europe 2019

ROOK

- Rook 1.0
- New features in Ceph, EdgeFS, and Minio operators
- CSI support
- And more...

<https://blog.rook.io/rrook-v1-0-a-major-milestone-689ca4c75508>

Bryan Liles, Senior Staff Engineer, VMware

KubeCon CloudNativeCon
Europe 2019

► <https://www.youtube.com/watch?v=vdxcaR3I2ic>

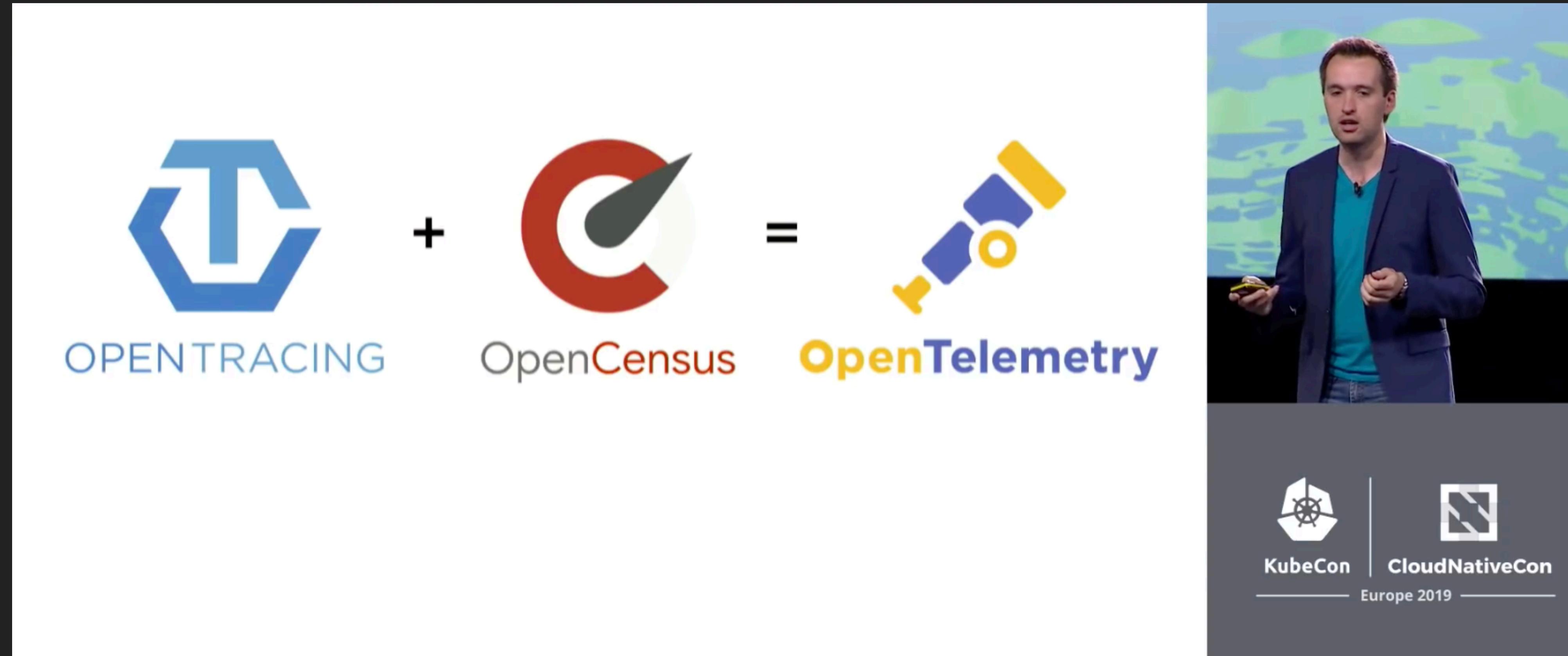
CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware

The image consists of two main parts. On the left is a white presentation slide with a red and orange gradient background at the top. The text "Incubating: CRI-O" is displayed in white. Below this is the cri-o logo, which features a blue hexagonal icon with a white snowflake-like pattern next to the word "cri-o" in blue lowercase letters. The middle section of the slide contains the following text:
CRI-O is an implementation of the
Kubernetes CRI to enable the use of OCI
compatible runtimes.

On the right is a video frame showing Bryan Liles, a Black man with glasses, wearing a purple checkered shirt and blue jeans, standing on a stage and speaking. He is gesturing with his hands. The background is a blurred green and blue pattern. At the bottom of the slide is a dark grey footer bar with the KubeCon and CloudNativeCon logos and the text "Europe 2019".

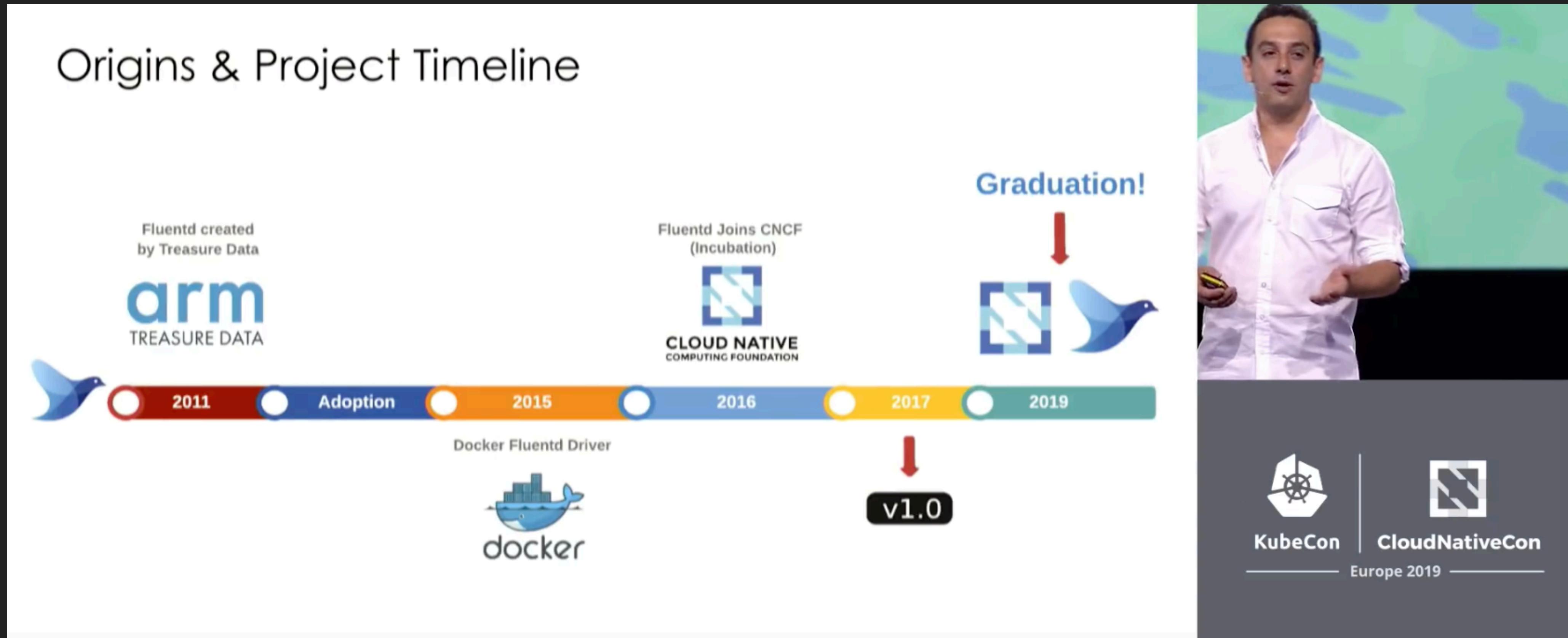
- ▶ <https://www.youtube.com/watch?v=vdxcaR3I2ic>

CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware



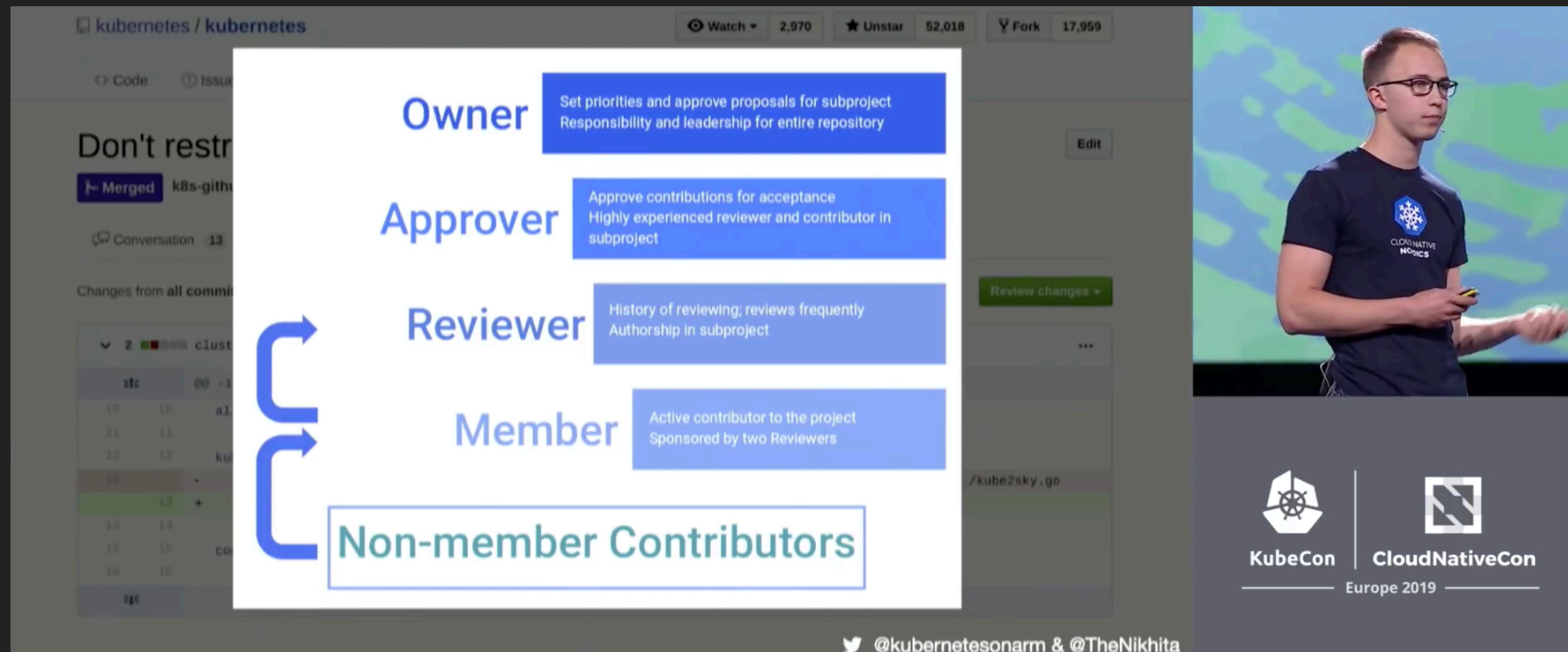
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CNCF Project Update - Bryan Liles, Senior Staff Engineer, VMware



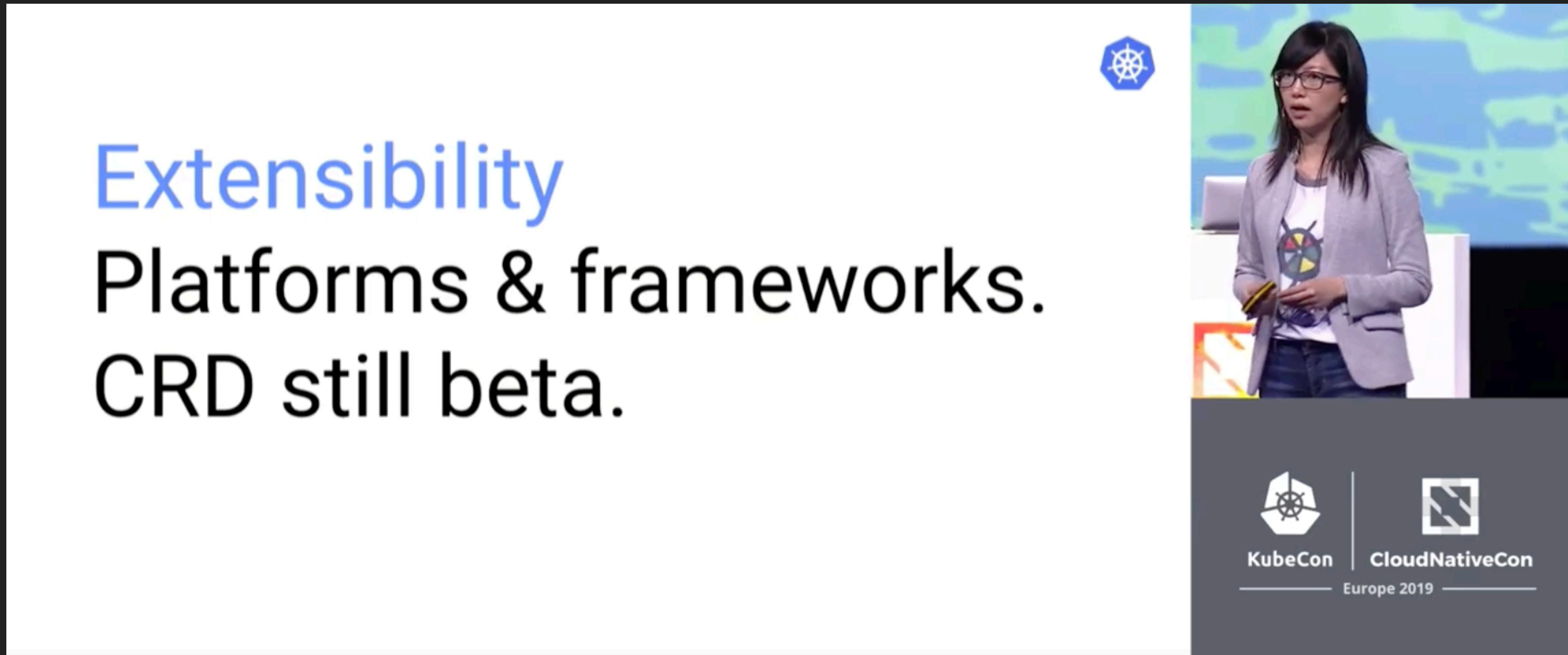
► <https://www.youtube.com/watch?v=vdxcaR3I2ic>

Getting Started in the Kubernetes Community - Lucas Käldström & Nikhita Raghunath



► <https://www.youtube.com/watch?v=Bho4miiByP0>

Kubernetes Project Update - Janet Kuo, Software Engineer, Google



The image shows a woman with glasses and dark hair, wearing a purple blazer over a white t-shirt with a colorful logo, standing on a stage and speaking. She is holding a small yellow object in her hands. Behind her is a large screen displaying a blue hexagonal icon with a white steering wheel symbol. To the right of the screen, there is a dark grey graphic element featuring the KubeCon and CloudNativeCon logos, separated by a vertical line, with the text "Europe 2019" below it.

Extensibility

Platforms & frameworks.
CRD still beta.

► <https://www.youtube.com/watch?v=jISu86XmkHE>

Kubernetes Project Update - Janet Kuo, Software Engineer, Google

Scalability Case Study:
Node Status.
300-600MB/min (5K nodes)
Solution: NodeLease

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Europe 2019

- ▶ <https://www.youtube.com/watch?v=jISu86XmkHE>

Kubernetes Project Update - Janet Kuo, Software Engineer, Google



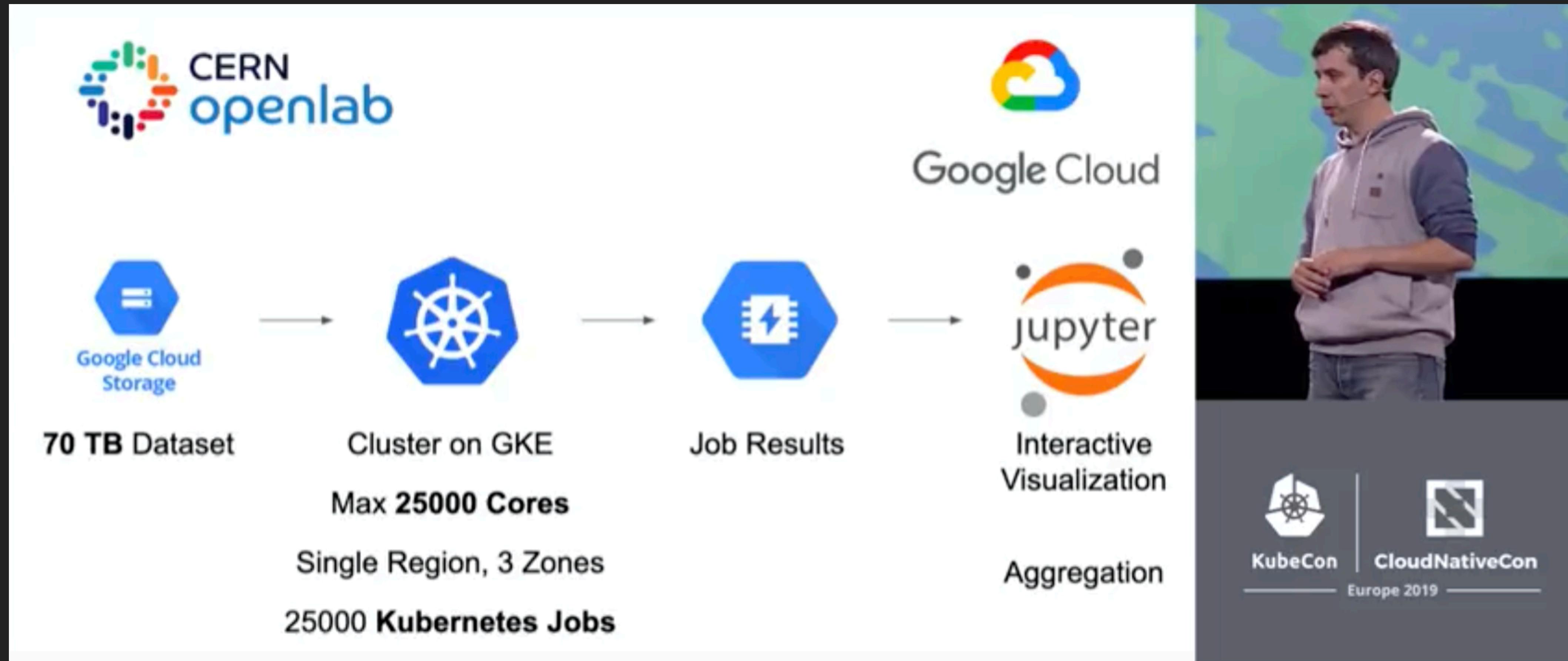
The image shows a woman with dark hair and glasses, wearing a light purple blazer over a white t-shirt with a colorful logo, standing on a stage and speaking. She is holding a small object in her hands. The background is a blue and green abstract pattern. In the top left corner of the slide, there is a small blue hexagonal icon with a white steering wheel symbol.

Reliability Case Study:
Cascading failures.
Bad Pods kill Nodes.
Eventually kill the cluster.

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Europe 2019

► <https://www.youtube.com/watch?v=jISu86XmkHE>

Reperforming a Nobel Prize Discovery on Kubernetes - Ricardo Rocha & Lukas Heinrich



► <https://www.youtube.com/watch?v=CTfp2woVEkA>

Expanding the Kubernetes Operator Community - Rob Szumski

Operators run your complex apps

Embed ops knowledge from the experts → Operator v1.1.2 → Deployments
StatefulSets
Autoscalers
Secrets
Config maps

Red Hat

KubeCon | CloudNativeCon
Europe 2019

► <https://www.youtube.com/watch?v=KPOEnFwspiY>

Expanding the Kubernetes Operator Community - Rob Szumski

The slide is divided into three main sections, each featuring a logo and a list of features:

- Docker + PostgreSQL**: Features "Containerized".
- Cloud Database**: Features "Containerized", "Cloud storage ready", "Replicated", "Backup", and "Automated updates".
- crunchydata + Operator Framework**: Features "Containerized", "Container storage ready", "Replicated", "Backup", "Automated updates", "Enhanced observability", "Customization", "Local development", "Fully Open Source", "Any Kubernetes", and "Certified on OpenShift".

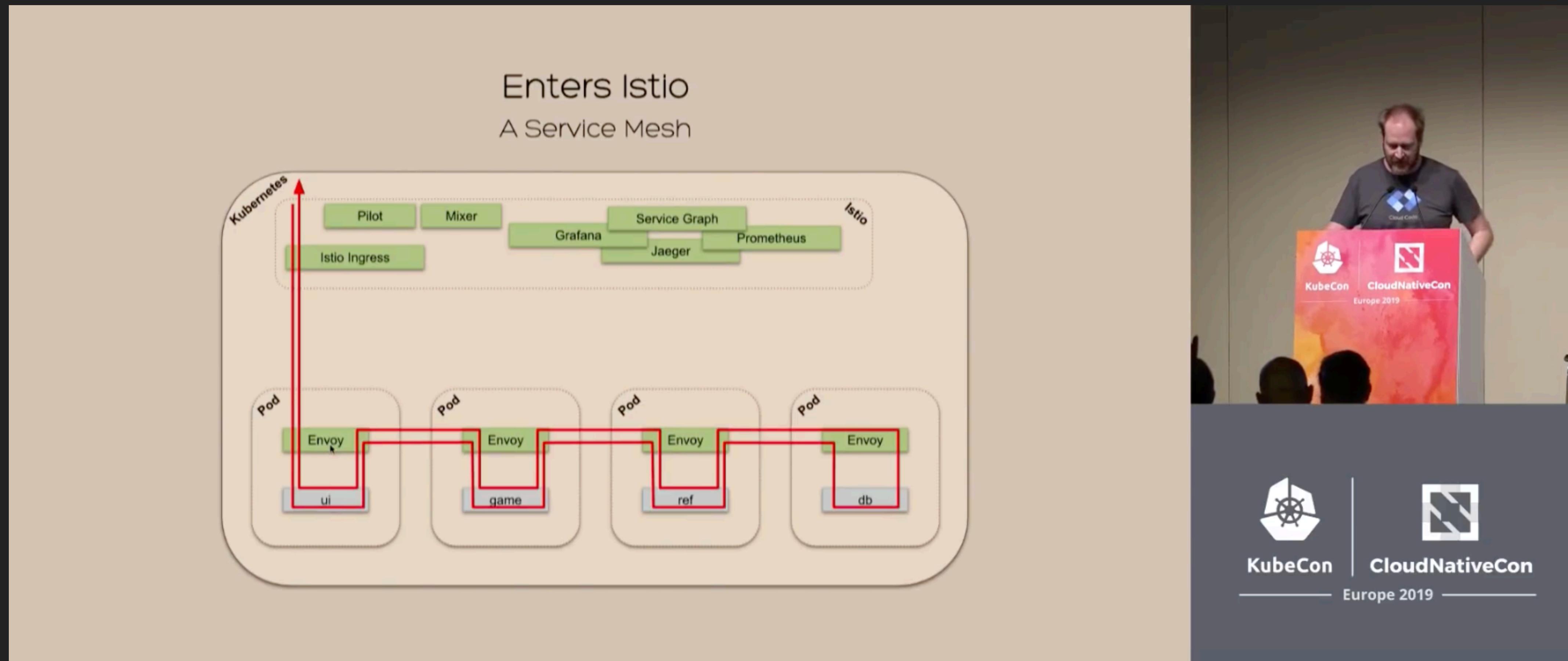
Operators are hybrid and more powerful

Red Hat

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► <https://www.youtube.com/watch?v=KPOEnFwspiY>

Istio, We Have a Problem! Understanding and Fixing Bugs with a Service-Mesh - David Gageot, Google



► <https://www.youtube.com/watch?v=9CQ0PMiOGhg>

Istio, We Have a Problem! Understanding and Fixing Bugs with a Service-Mesh - David Gageot, Google

The image is a composite of two parts. On the left is a screenshot of the Kiali UI, a service mesh observability tool. The title bar says "http://localhost:20001/kiali". The main area shows a "Graph" of a service mesh topology. Nodes include "istio-ingressgateway istio-system", "hexagons-ui v1", "hexagons-game v1", "hexagons-ref v1", and "hexagons-db v1". Edges show traffic flow between these services. To the right of the graph are several monitoring charts: "HTTP Traffic (requests per second)" with a total of 13.54 RPS, 92.10% success, and 7.90% error; "HTTP - Total Request Traffic min / max" with RPS from 0.00 to 15.30; and "TCP - Total Traffic - min / max" for both sent and received traffic. On the right side of the image, a man with a beard is speaking at a podium. The podium has the "KubeCon CloudNativeCon Europe 2019" logo. The background is a blurred conference room.

► <https://www.youtube.com/watch?v=9CQ0PMiOGhg>

Istio, We Have a Problem! Understanding and Fixing Bugs with a Service-Mesh - David Gageot, Google

The image is a composite of three parts. On the left, a terminal window shows two commands being run: `kubectl -n istio-system port-forward svc/kiali 20001` and `kubectl -n istio-system port-forward svc/jaeger-query 16686`. The Kiali port-forwarding command outputs that forwarding is from 127.0.0.1:20001 to 20001, and the Jaeger port-forwarding command outputs that forwarding is from 127.0.0.1:16686 to 16686. In the center, a screenshot of the Jaeger UI shows a trace for the service mesh. The trace path is: istio-ingressgateway->hexagons-ui.default.svc.cluster.local:8080/* c9e73aa. Below the path, a timeline visualization shows several colored bars representing different service components. On the right, a man with a beard, wearing a dark t-shirt with 'Cloud Core' on it, is speaking at a podium. The podium has the 'KubeCon' and 'CloudNativeCon Europe 2019' logos. The background behind the speaker is a large screen showing the same KubeCon/CloudNativeCon Europe 2019 branding.

► <https://www.youtube.com/watch?v=9CQ0PMiOGhg>

Istio, We Have a Problem! Understanding and Fixing Bugs with a Service-Mesh - David Gageot, Google

Canary deployment
Deploy the fix only to one user

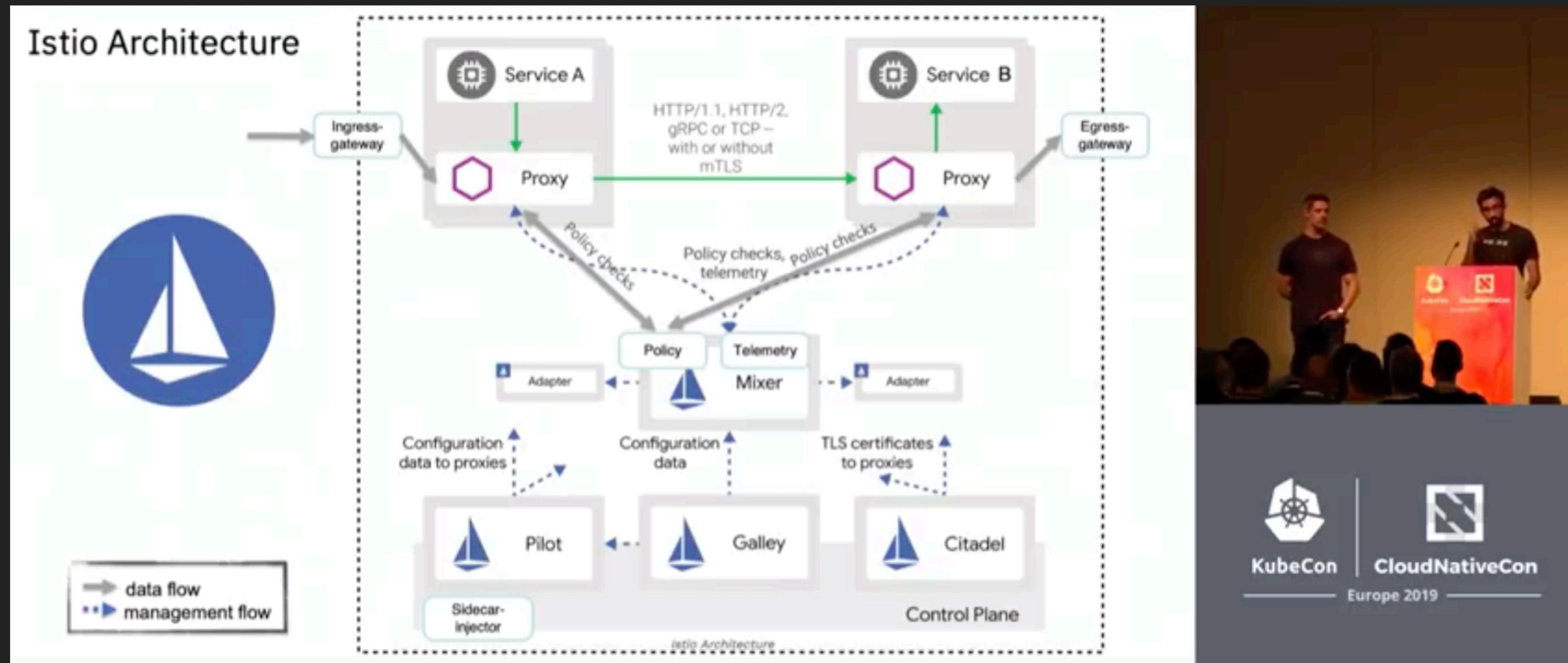
```
graph LR; ui((ui v1)) -- "Any user" --> db((db v1)); ui -- "User: david" --> game_fix((game fix)); game((game v1)) --> game_fix; ref((ref v1)) --> game_fix;
```

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KubeCon CloudNativeCon Europe 2019

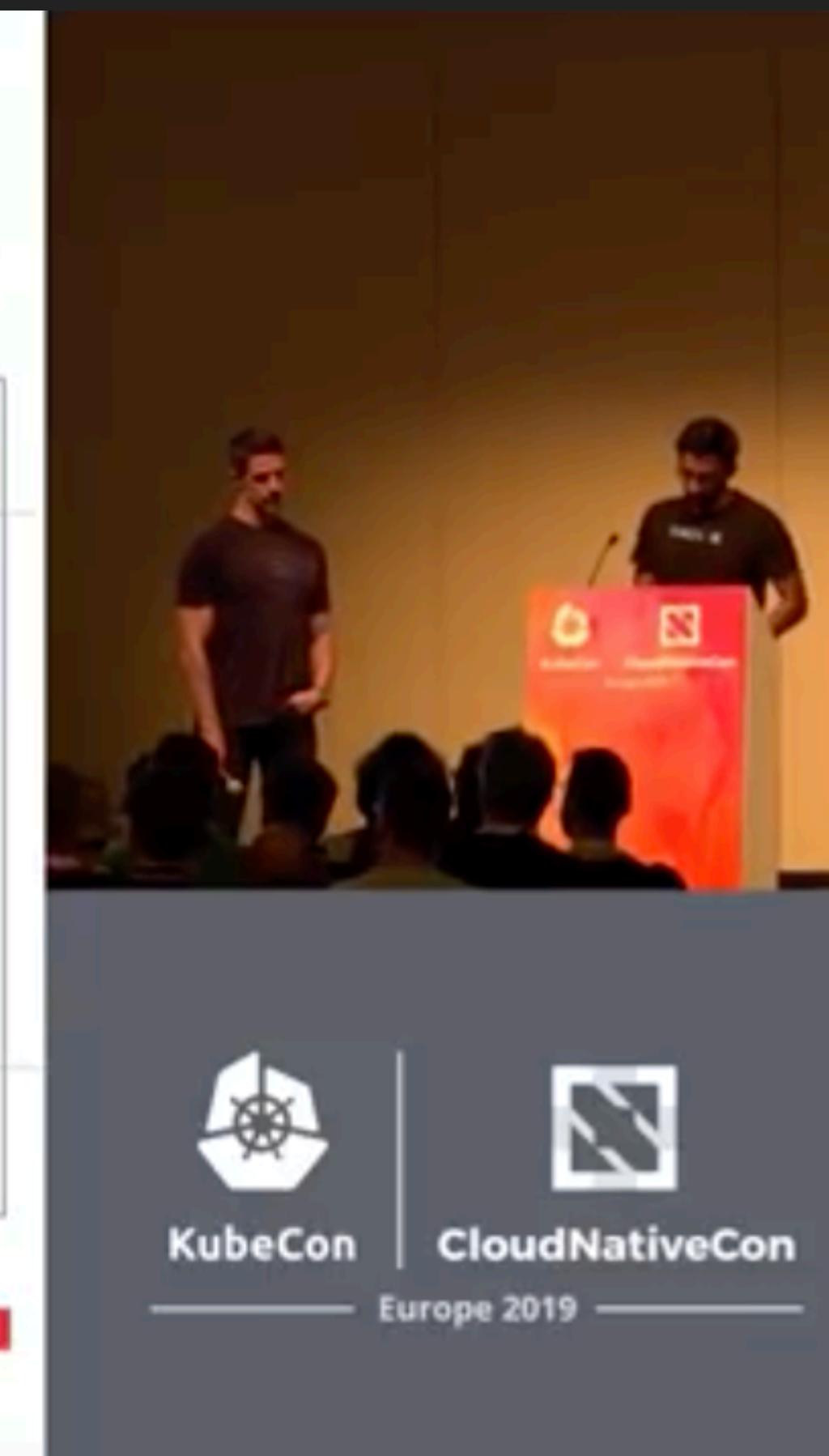
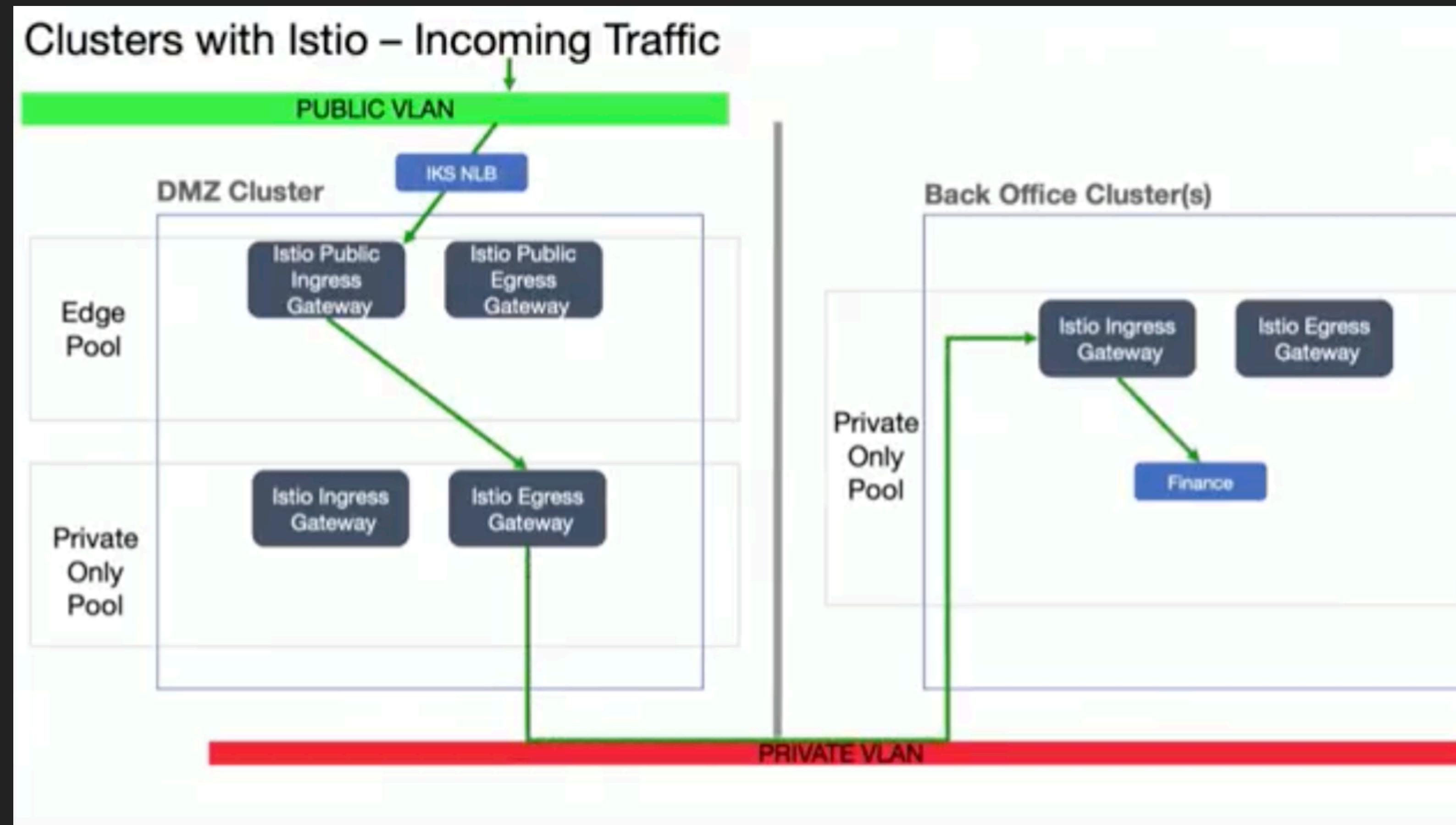
► <https://www.youtube.com/watch?v=9CQ0PMiOGhg>

Istio Multi-Cluster Service Mesh Patterns Explained - Daniel Berg & Ram Vennam, IBM



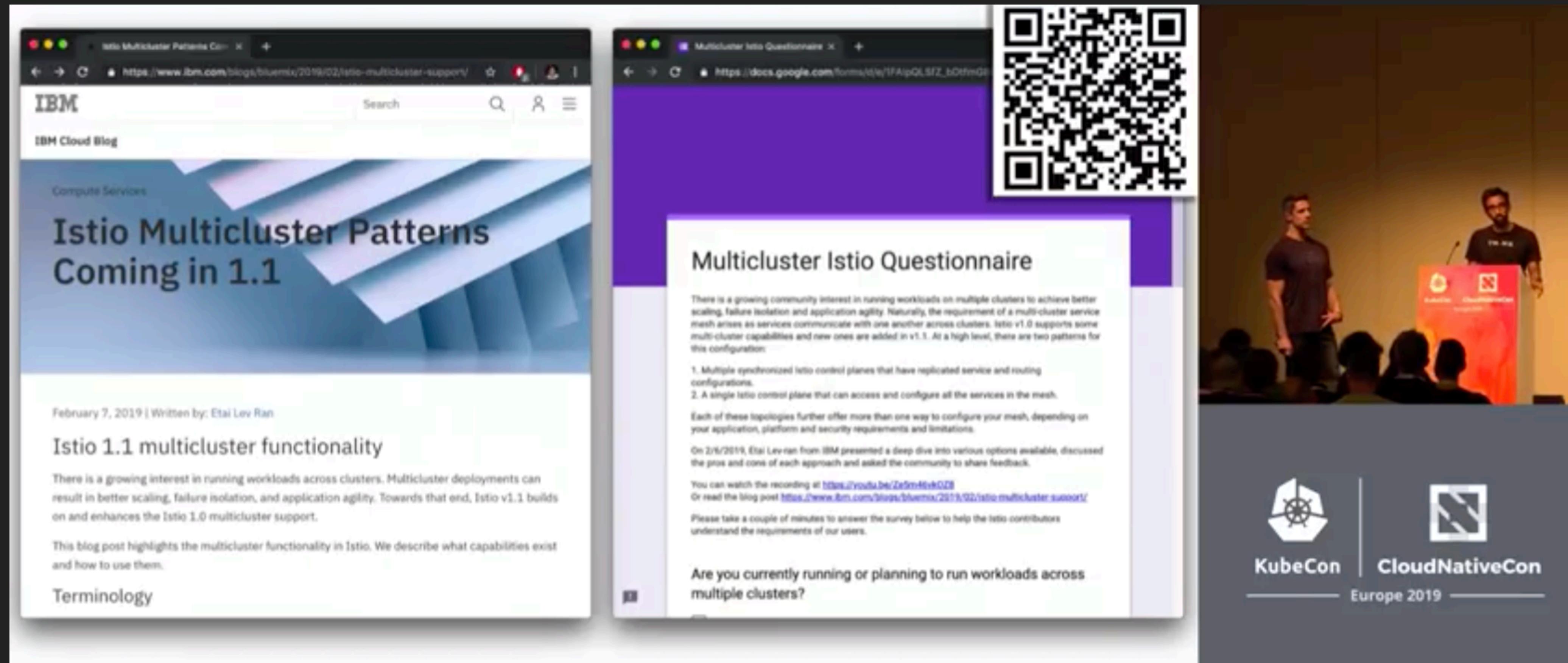
► <https://www.youtube.com/watch?v=-zsThiLvYos>

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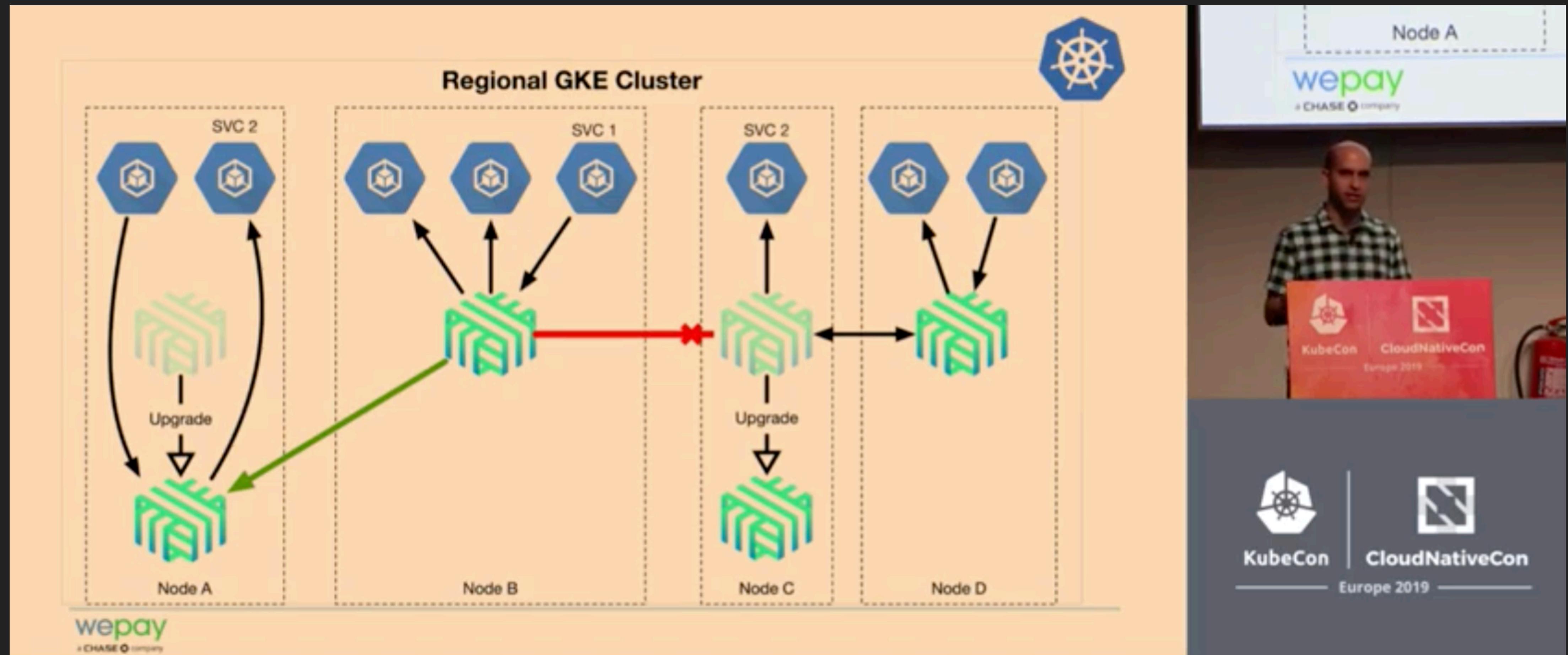
► <https://www.youtube.com/watch?v=-zsThiLvYos>

Istio Multi-Cluster Service Mesh Patterns Explained - Daniel Berg & Ram Vennam, IBM



► <https://www.youtube.com/watch?v=-zsThiLvYos>

What WePay Learned From Processing Billions of Dollars on GKE Using Linkerd – Mohsen Rezaei, WePay



► https://www.youtube.com/watch?v=ph_NqGNHdhM

Democratizing Service Mesh on Kubernetes - Gabe Monroy, Microsoft & CNCF Board Member

Service Mesh Interface (SMI)

A Kubernetes interface that provides traffic routing, traffic telemetry, and traffic policy

Standardized
Standard interface for service mesh on Kubernetes

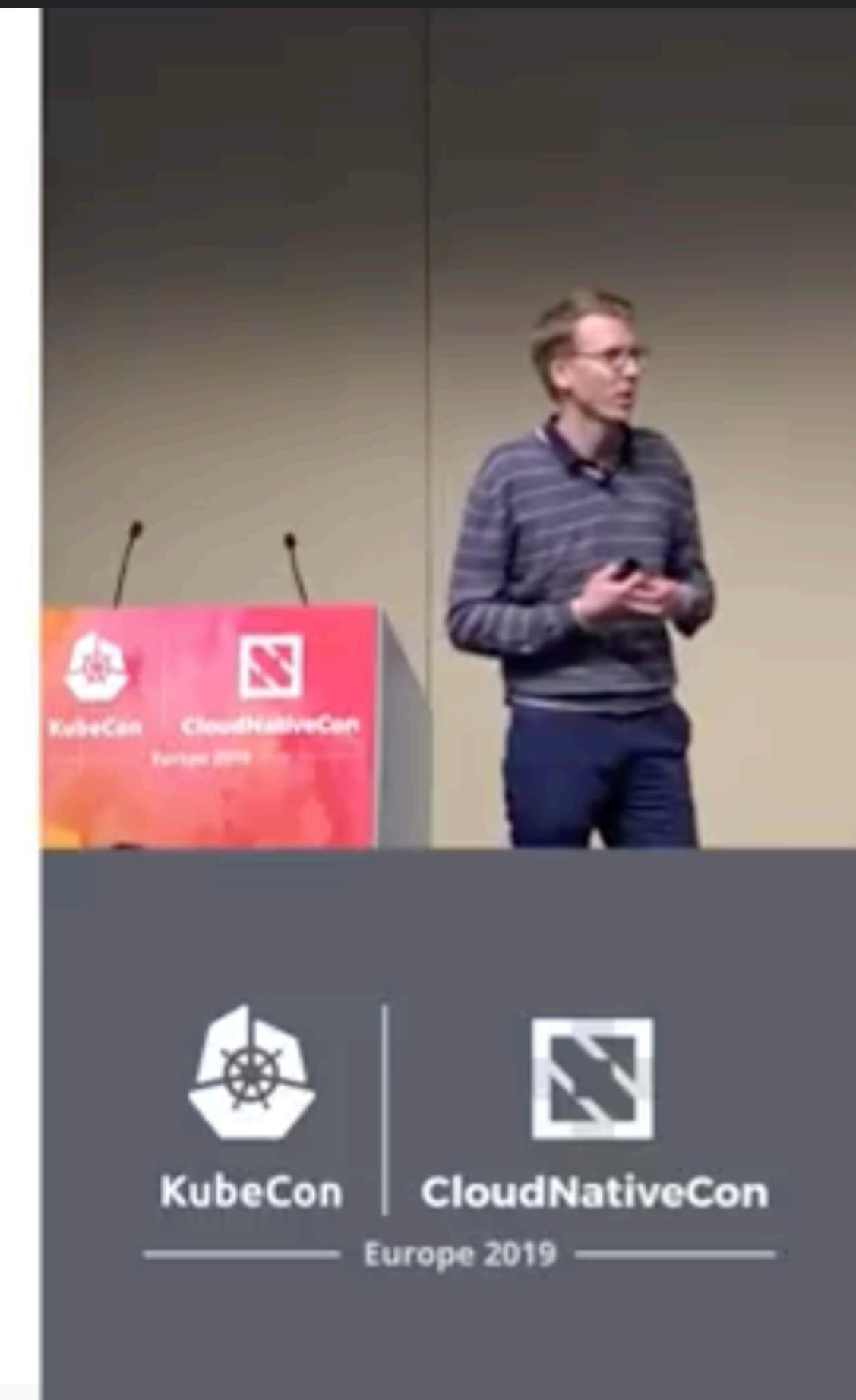
Simplified
Basic feature set to address most common scenarios

Extensible
Support for new features as they become widely available

 
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► <https://www.youtube.com/watch?v=gDLD8gyd7J8>

Kubernetes Failure Stories and How to Crash Your Clusters - Henning Jacobs, Zalando SE



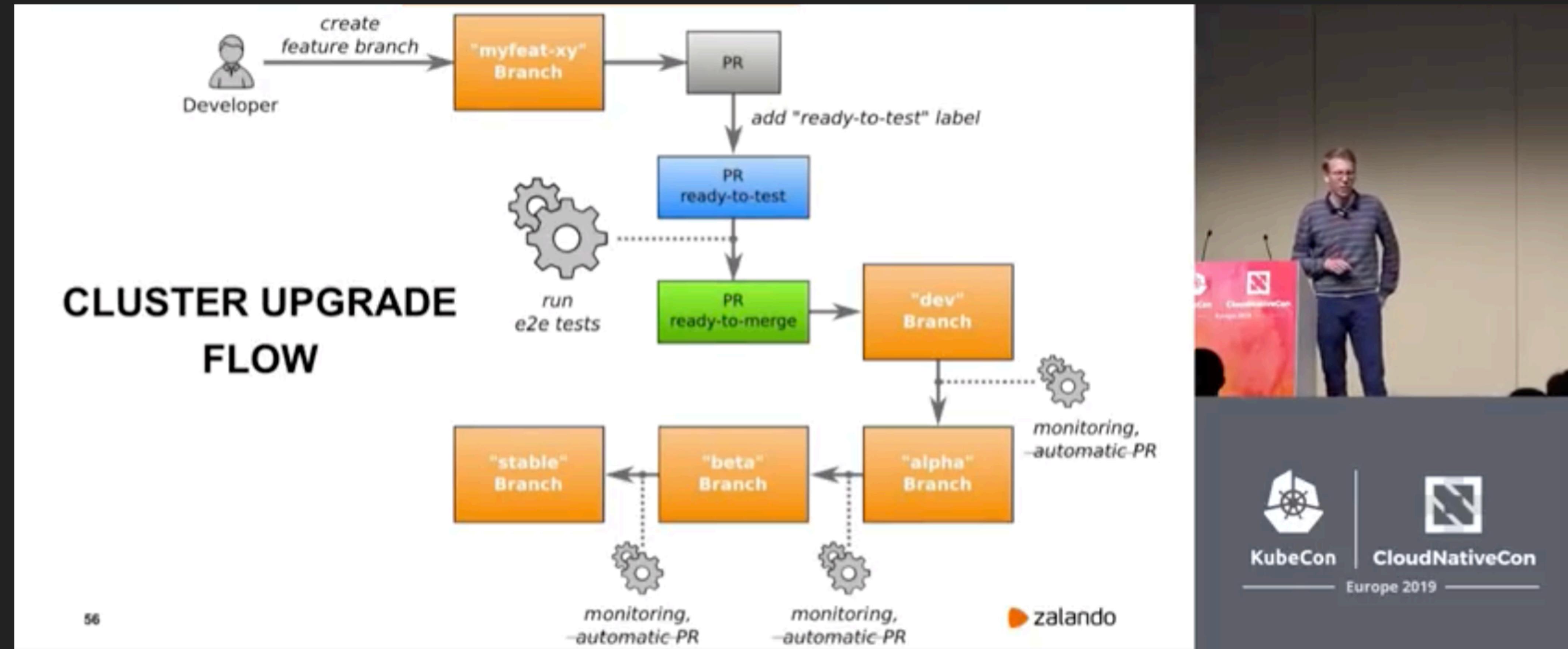
► <https://www.youtube.com/watch?v=6sDTB4eV4F8>

Kubernetes Failure Stories and How to Crash Your Clusters - Henning Jacobs, Zalando SE

The image is a composite of several elements. On the left, there is a large screenshot of a monitoring interface titled "INCIDENT #8: CPU THROTTLING". The interface shows a CPU usage graph with multiple metrics: usage (green), request (yellow), limit (red), and throttling (purple). A prominent red area indicates high CPU usage, with a large yellow flame icon overlaid. On the right side of the image, a man in a striped shirt stands behind a podium, looking down at a device. The podium has a pink cloth with the "KubeCon + CloudNativeCon Europe 2019" logo. Below the podium, there is a dark banner with the "zalando" logo. At the bottom left of the image, the number "71" is visible. At the bottom right, there is a small watermark for "KubeCon | CloudNativeCon Europe 2019".

► <https://www.youtube.com/watch?v=6sDTB4eV4F8>

Kubernetes Failure Stories and How to Crash Your Clusters - Henning Jacobs, Zalando SE



► <https://www.youtube.com/watch?v=6sDTB4eV4F8>

Kubernetes Failure Stories and How to Crash Your Clusters - Henning Jacobs, Zalando SE

WILL MANAGED K8S SAVE US?

Amazon EKS Announces 99.9% Service Level Agreement

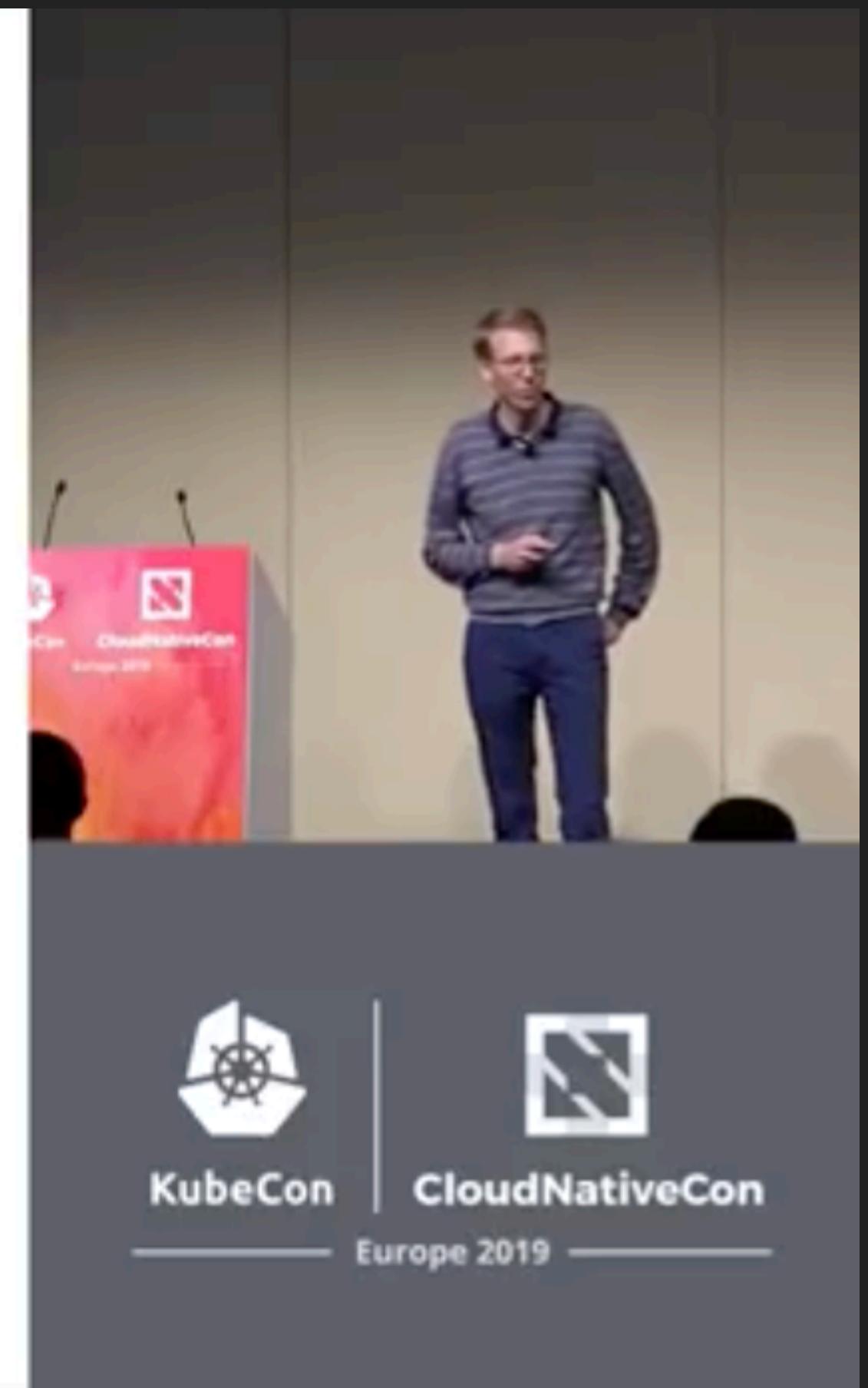
Posted On: Jan 16, 2019

AWS has published a service level agreement (SLA) for [Amazon Elastic Container Service for Kubernetes \(EKS\)](#), which provides availability guarantees for Amazon EKS.

GKE: monthly uptime percentage at 99.95% for regional clusters

80





► <https://www.youtube.com/watch?v=6sDTB4eV4F8>

Kubernetes Failure Stories and How to Crash Your Clusters - Henning Jacobs, Zalando SE

WILL MANAGED K8S SAVE US?

NO

(not really)

e.g. AWS EKS uptime SLA is only for API server

81

zalando

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Europe 2019

A man in a striped shirt stands on a stage, speaking to an audience. A red banner with the Zalando logo is visible behind him.

► <https://www.youtube.com/watch?v=6sDTB4eV4F8>

How Spotify Accidentally Deleted All its Kube Clusters with No User Impact



► <https://www.youtube.com/watch?v=ix0Tw8uinWs>

Learn how to Leverage Kubernetes to Support 12 Factor for Enterprise Apps

I. Codebase

One codebase tracked in revision control, many deploys

II. Dependencies

Explicitly declare and isolate dependencies

III. Config

Store config in the environment

IV. Backing services

Treat backing services as attached resources

V. Build, release, run

Strictly separate build and run stages

VI. Processes

Execute the app as one or more stateless processes

VII. Port binding

Export services via port binding

VIII. Concurrency

Scale out via the process model

IX. Disposability

Maximize robustness with fast startup and graceful shutdown

X. Dev/prod parity

Keep development, staging, and production as similar as possible

XI. Logs

Treat logs as event streams

XII. Admin processes

Run admin/management tasks as one-off processes

Why 12 factor apps?

- **Make it easier to run, scale, and deploy applications**
- **Keep parity between development and production**
- **Provide strict separation between build, release, and run stages**

5

▶ https://static.sched.com/hosted_files/kccnceu19/6c/

Learn%20how%20to%20Leverage%20Kubernetes%20to%20Support%2012%20Factor%20for%20Enterprise%20Apps.pdf

MONITORING

- ▶ <https://www.youtube.com/watch?v=EFutyulpFXQ>



- ▶ Barcelona '19: KubeCon + CloudNativeCon

