

# Hands-on practices for Controlling Kubernetes Native Apps with Service Mesh



A hands-on experience for Dev professionals

**Welcome to  
IstioCon 2022!**

# About Me



## Daniel Oh

- Senior Principal Technical Marketing Manager at Red Hat 
  - Cloud Native Runtimes
  - Serverless and Service Mesh practices
- Ambassador for CNCF  and DevOps Institute 
- Advisory Board Member of Global Skill Development Council 
- Opensource.com Correspondents
- Public Speaker & Developer Advocate
- Published Author
  - [Practical Ansible 2](#)
  - [Quarkus for Spring Developers](#)



 @danieloh30

 [bit.ly/danielohtv](https://bit.ly/danielohtv)

 danieloh30

# Service Mesh Champions



Simon Seagrave

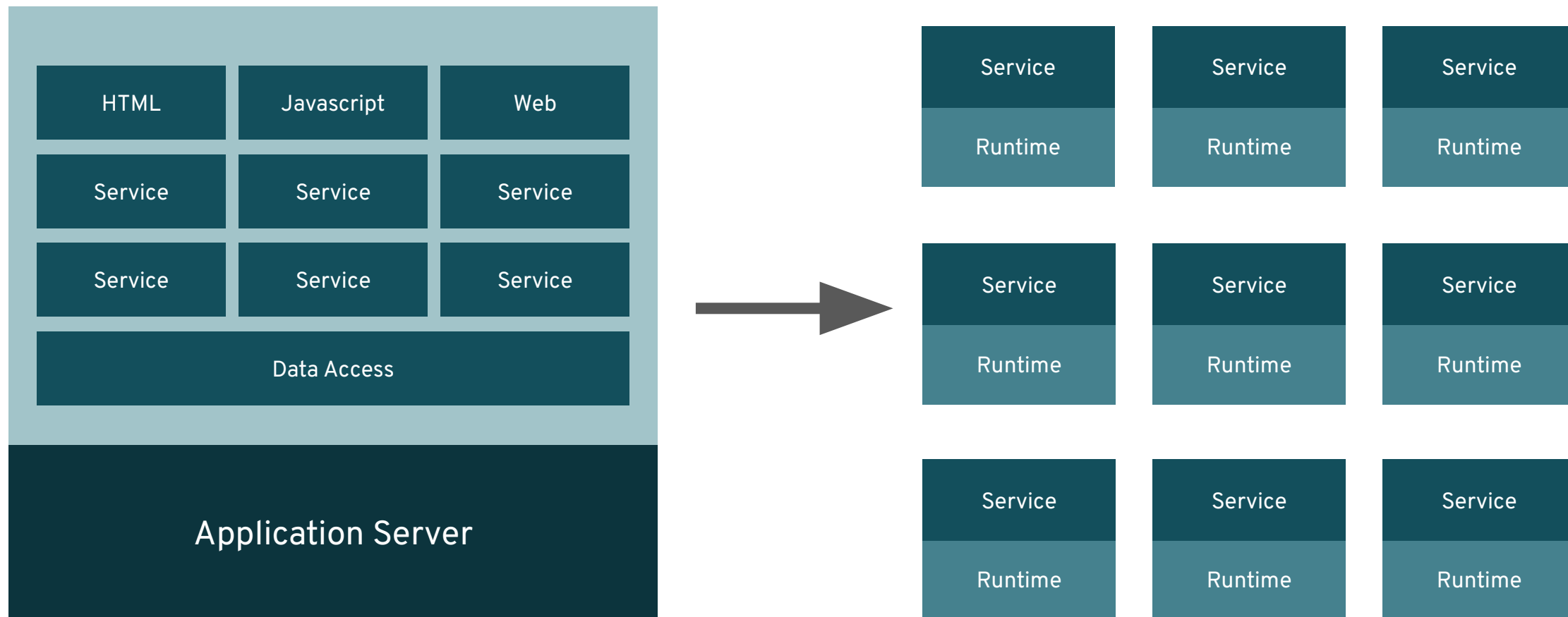
Principal Product Marketing Manager  
Red Hat



Stelios Kousouris

Senior Architect  
Red Hat

# DISTRIBUTED ~~MICROSERVICES~~ ARCHITECTURE



# DISTRIBUTED COMPUTING CHALLENGES

## Fallacies of Distributed Computing

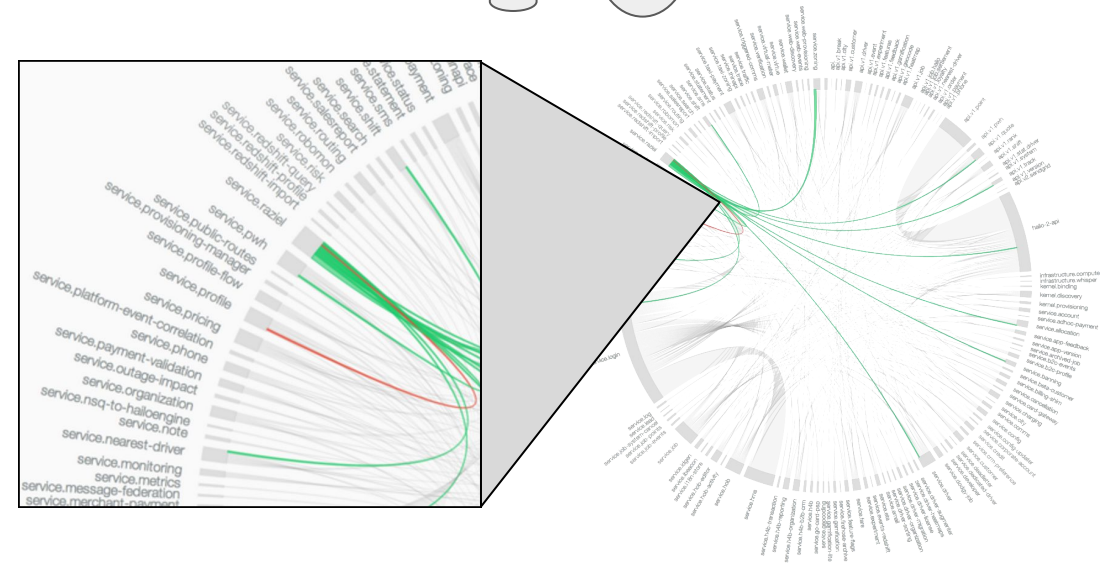
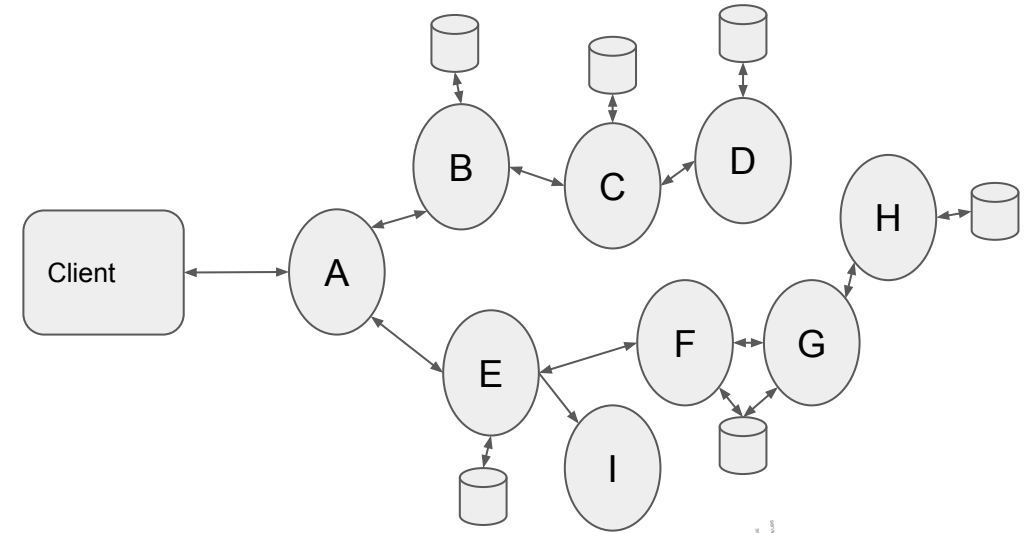
- The network is reliable.
- Latency is zero.
- Bandwidth is infinite.
- The network is secure.
- Topology doesn't change.
- There is one administrator.
- Transport cost is zero.
- The network is homogeneous.

[wikipedia.org/wiki/Fallacies\\_of\\_distributed\\_computing](https://wikipedia.org/wiki/Fallacies_of_distributed_computing)

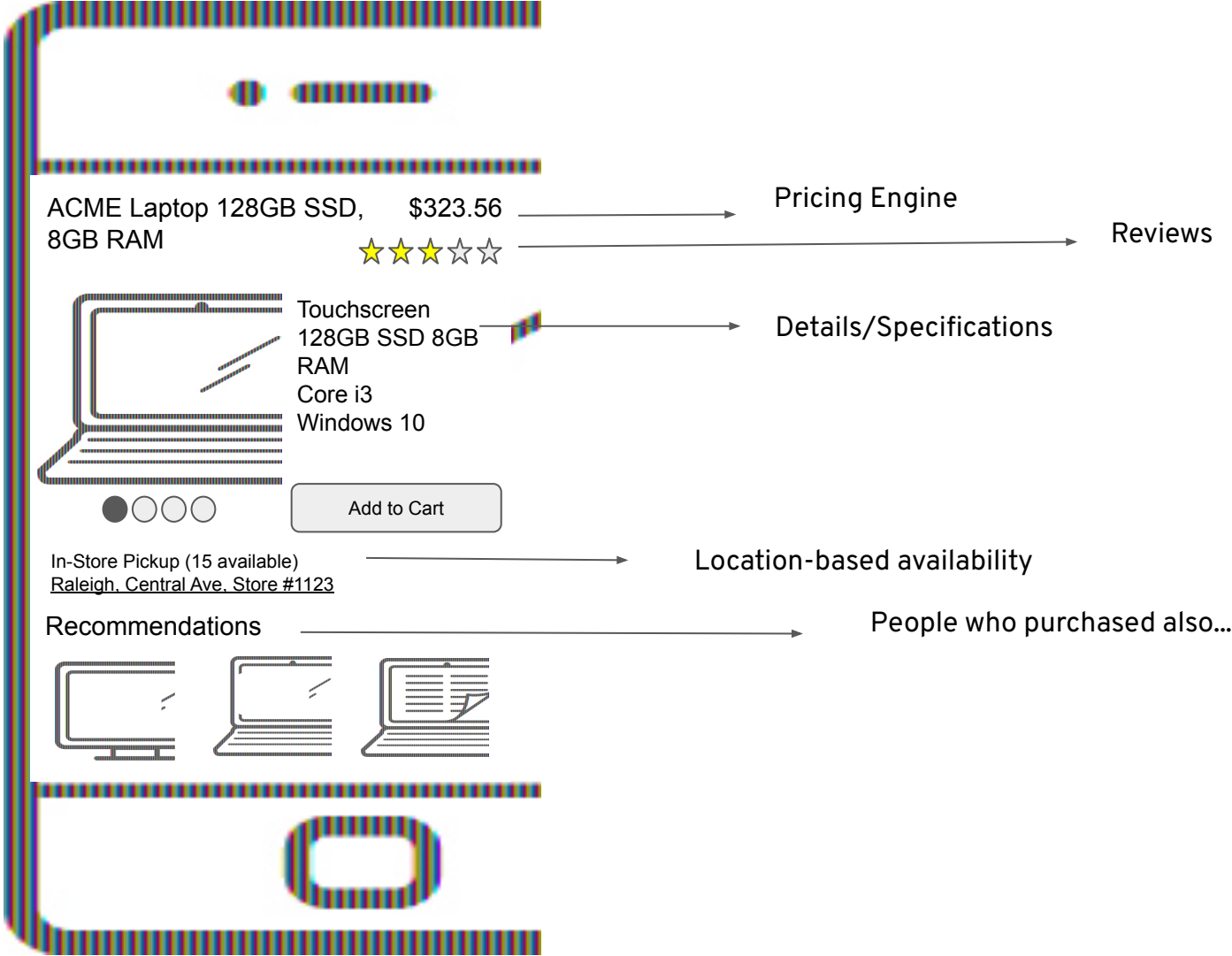


## Because applications must deal with

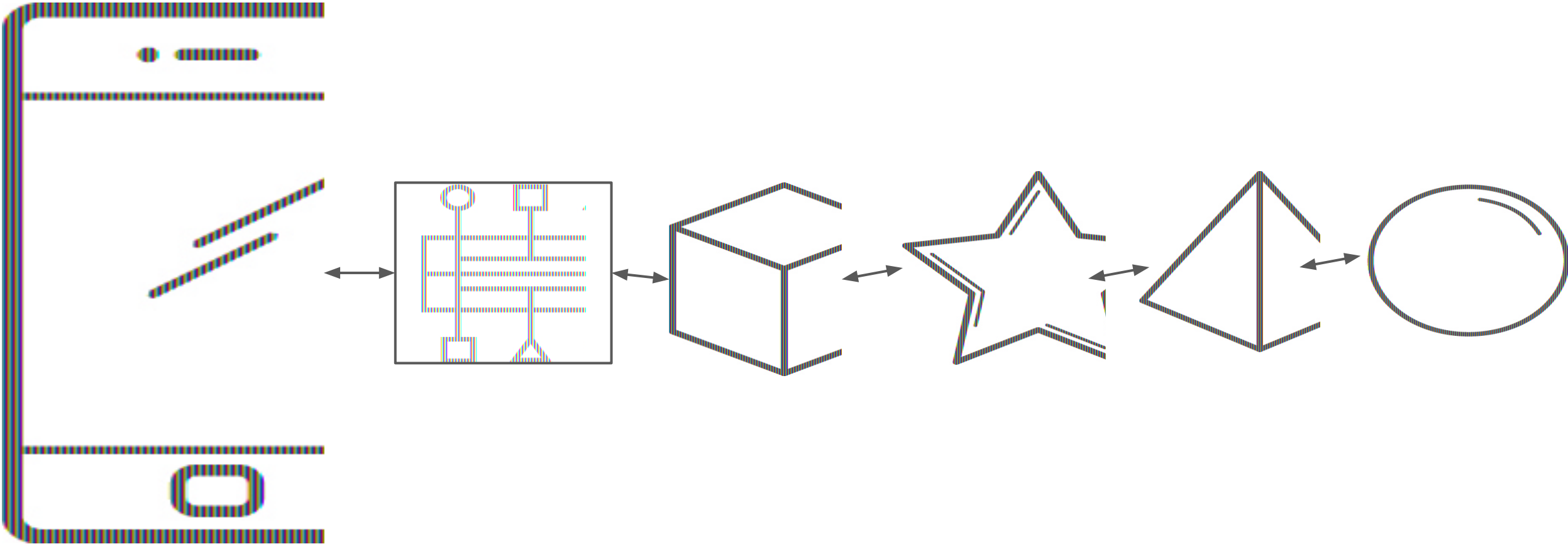
- Unpredictable failures
- End-to-end application correctness
- System degradation
- Topology changes
- Elastic/ephemeral/transient resources
- Distributed logs
- The fallacies of distributed computing



# AN EXAMPLE

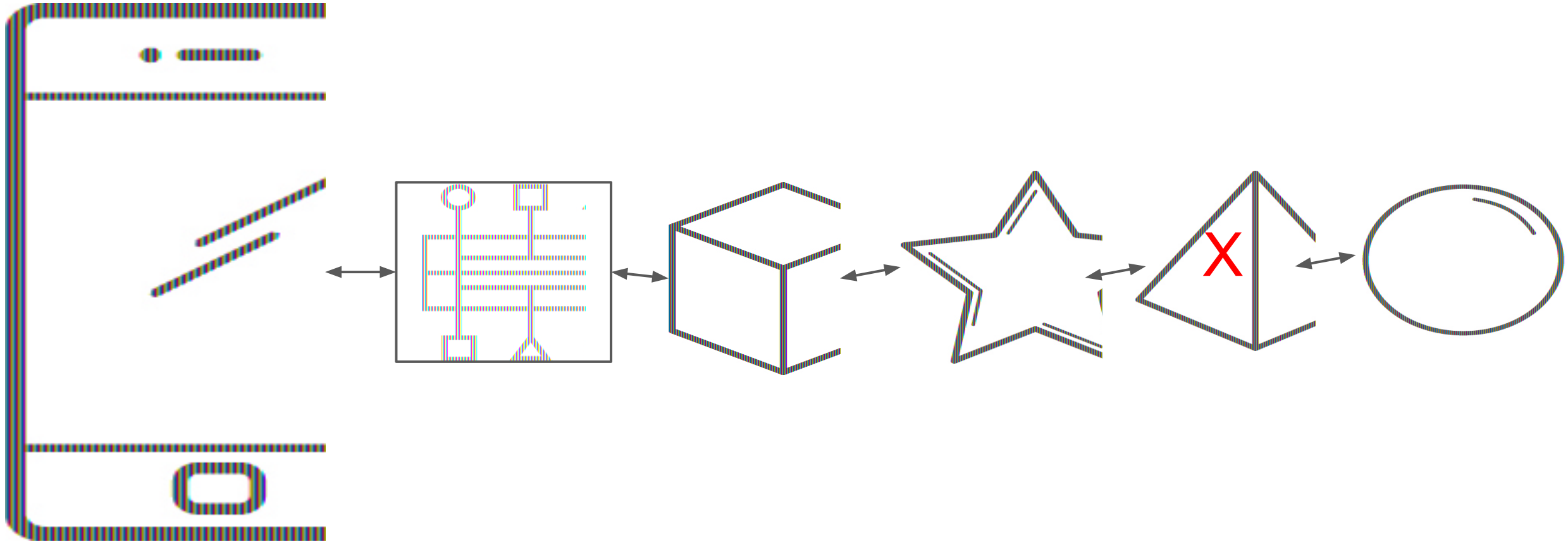


# CHAINING

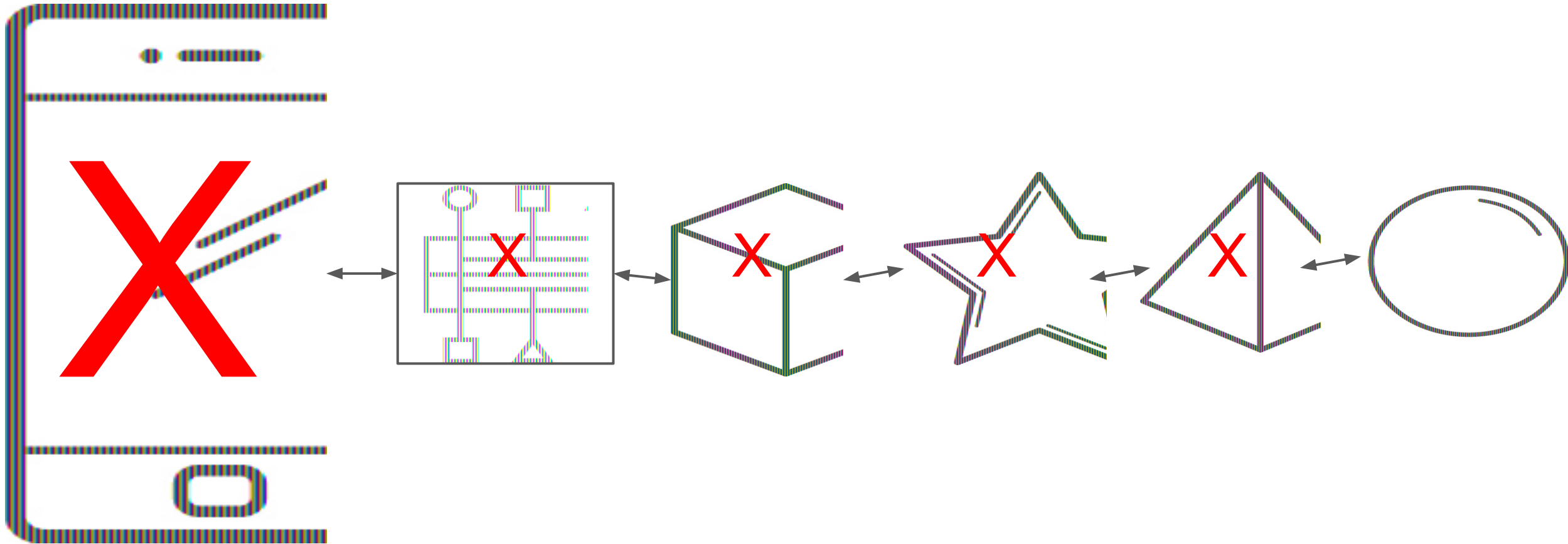




# CHAINING (FAILURE)



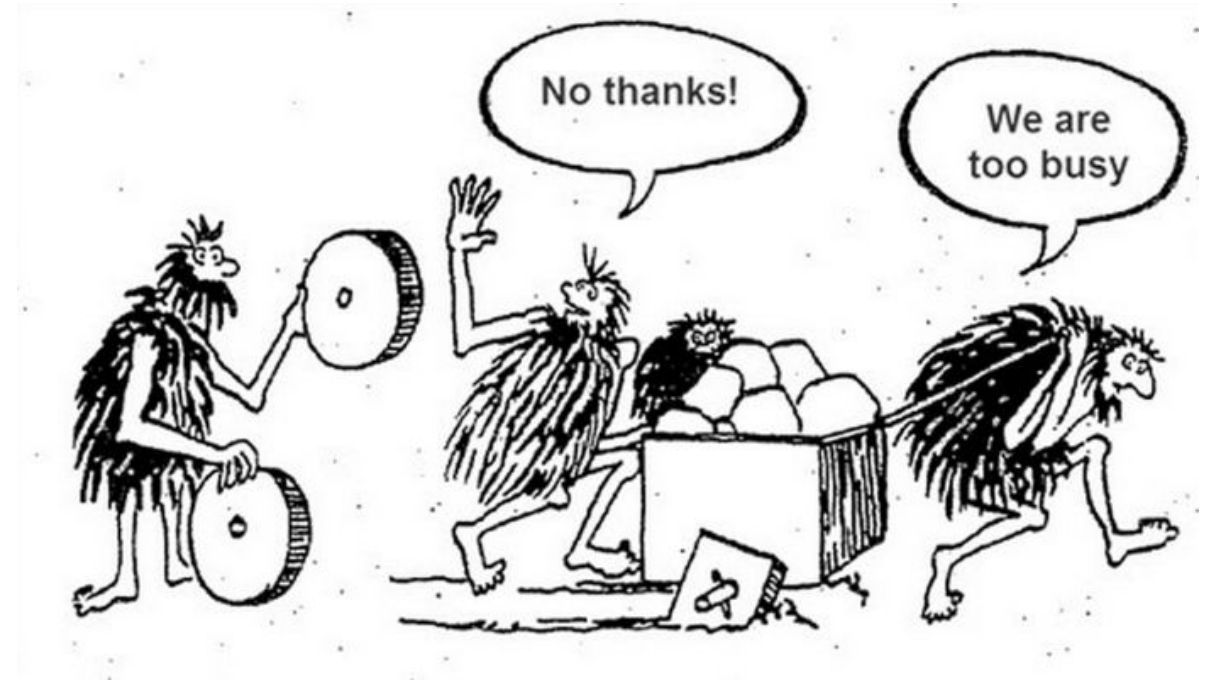
# AN CHAINING (CASCADING FAILURE)



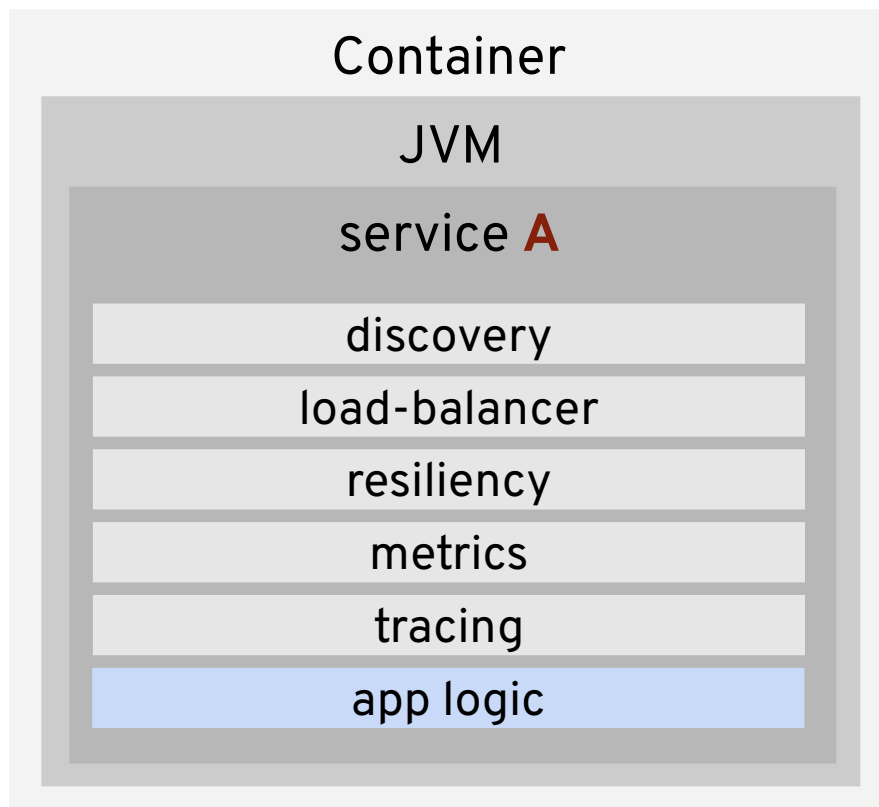
# POSSIBLE SOLUTIONS

Have your developers do this:

- Circuit Breaking
- Bulkheading
- Timeouts/Retries
- Service Discovery
- Load Balancing
- Traffic Control



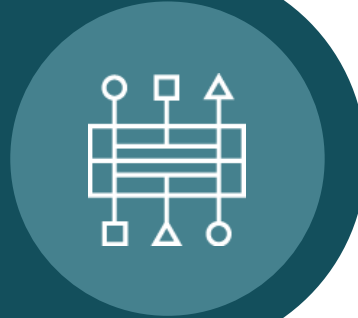
# NETFLIX | OSS



***Need a library to support each language/framework combination***

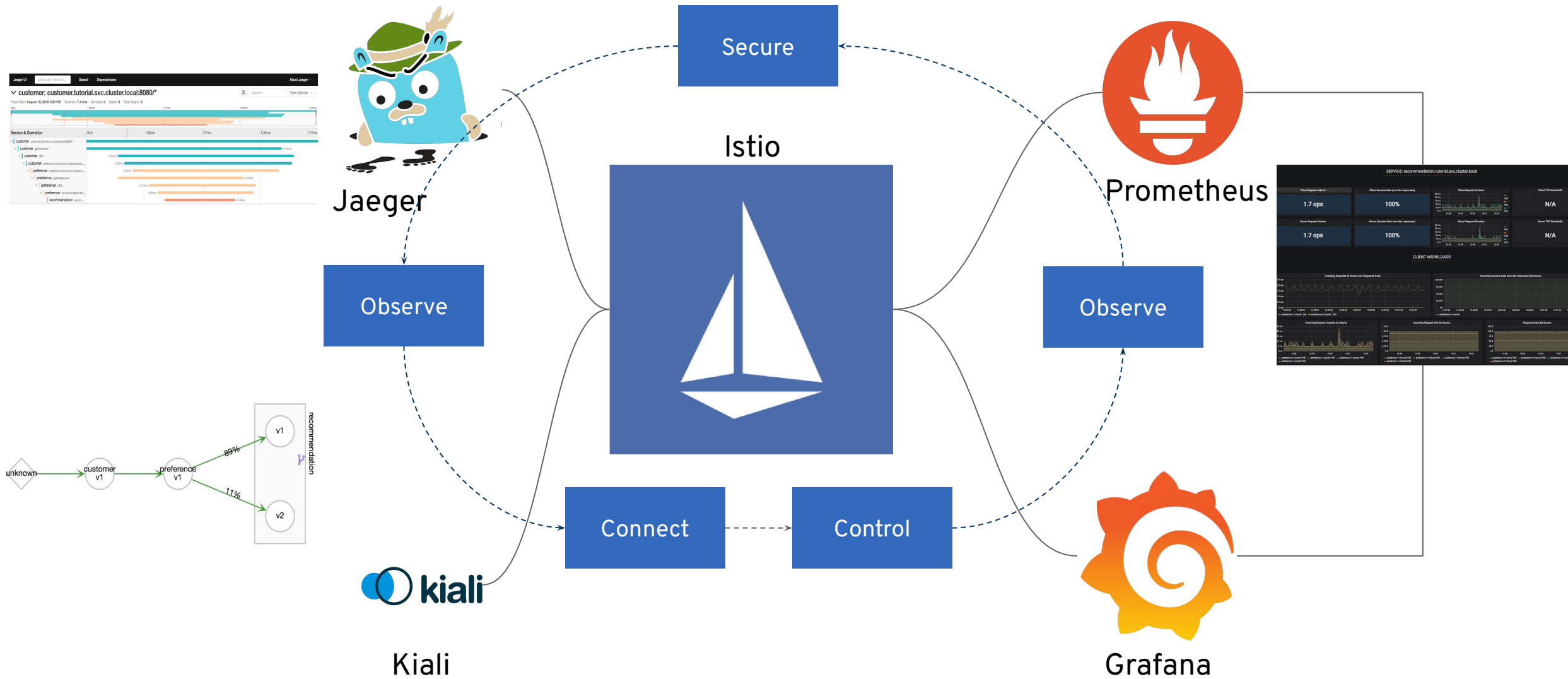
# WHAT ABOUT...?

POLYGLOT  
APPS



EXISTING  
APPS

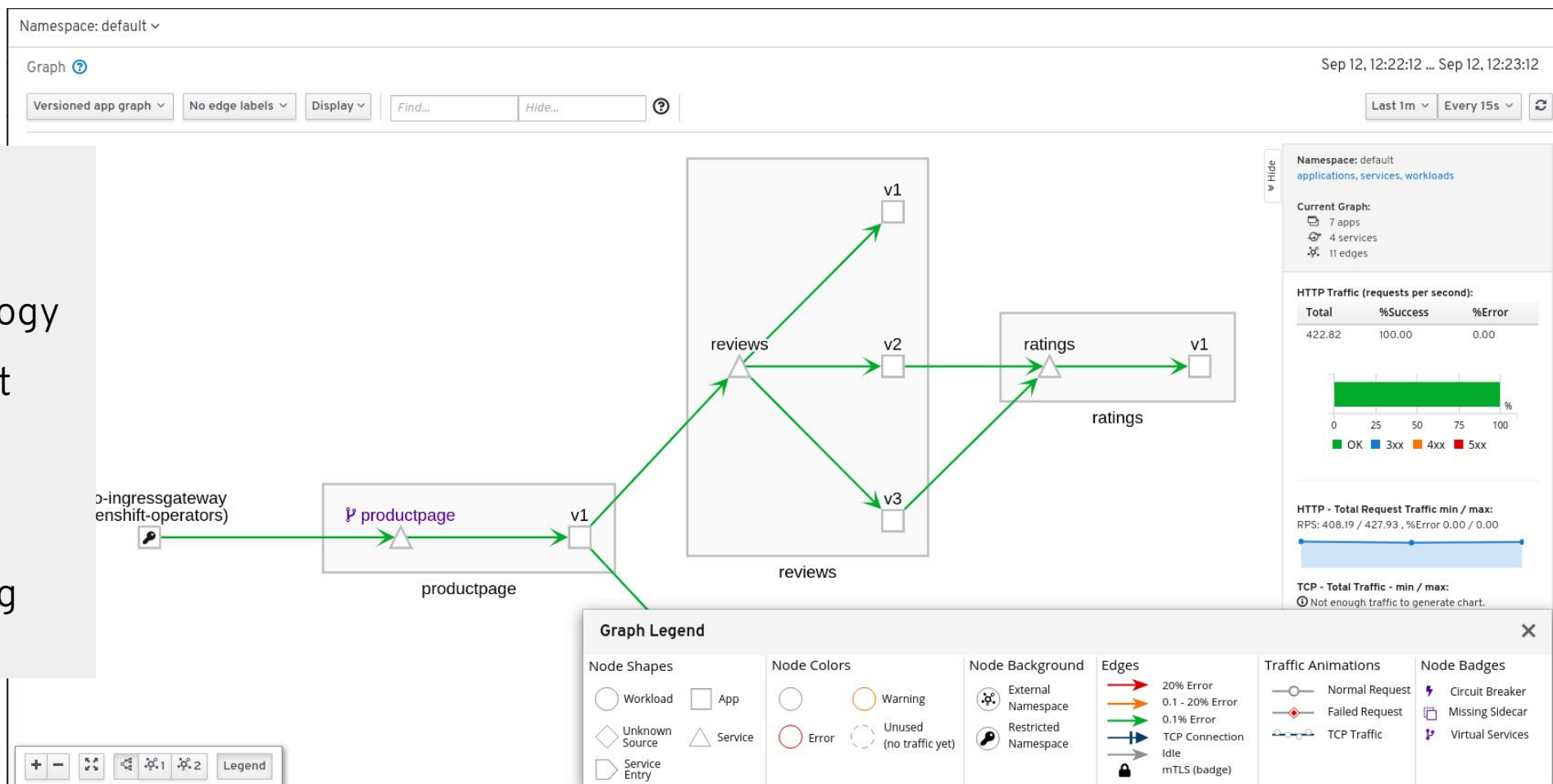
# Service Mesh Ecosystem



# Enhanced Visualization of Cluster Traffic With Kiali

Visualization of what  
Matters most:

- Application Topology
- Traffic throughput
- Error Rates
- Service Latency
- Service Versioning





# In this lab you will learn:

- How to deploy apps into the **OpenShift Service Mesh**
- How to generate and visualize **deep metrics** for apps with **Kiali** console
- How to **alter routing** dynamically
- How to **inject faults** for testing
- How to do **rate limiting**
- How the mesh implements **circuit breaking** and **distributed tracing**
- How to integrate **Red Hat SSO** with **OpenShift Service Mesh** to provide mesh-level authentication and access control

# Accessing your environment

- **Everything is done in browser** - no local commands or installs needed on your laptop
- Tested with **Chrome 83.0.4103.116, Firefox 68.7.0esr** and the latest
- If things get weird, just reload browser page
- **Turn off VPN** (we use websockets extensively), **pause AdBlock** for the lab domain (there are no ads)
- Everyone will get their own **unique logins**

**If stuck, ask anything in Q&A!**

[bit.ly/istiocn22-sm-lab](https://bit.ly/istiocn22-sm-lab)



# Red Hat

Containers & Cloud Native Roadshow

## Account Assignment

Enter your E-Mail Address and password in the form below to request lab access

**E-Mail Address**

e.g jane@doe.com

**Password**

r3dh4t! e.g labsecret

**Submit**

[bit.ly/istiocon22-sm-lab](https://bit.ly/istiocon22-sm-lab)



**Red Hat** Containers & Cloud Native Roadshow

### Credentials for doh@redhat.com

Username

user1

Password

r3dh4t1!

### Modules

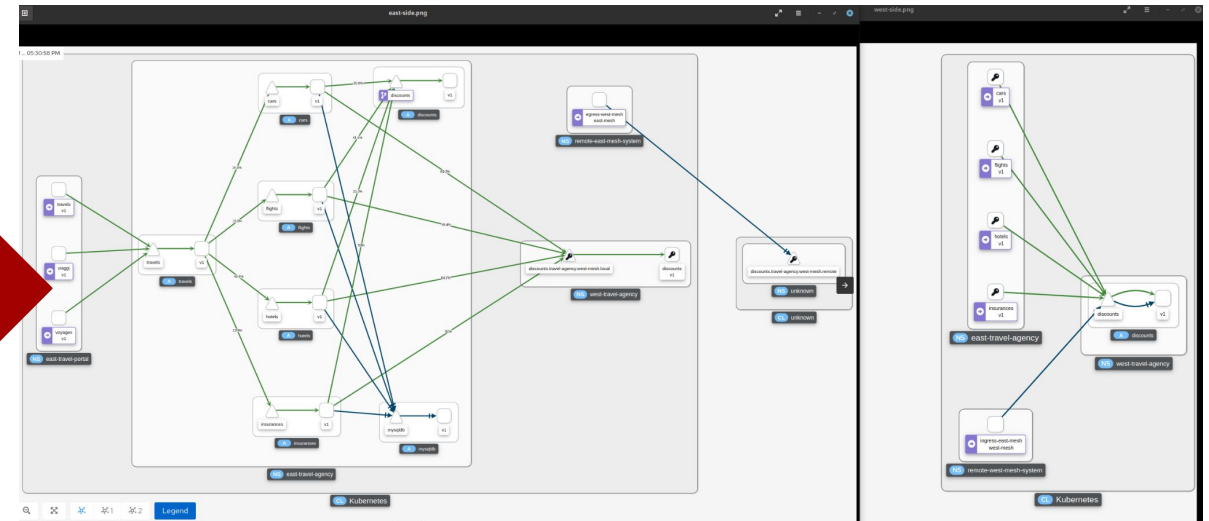
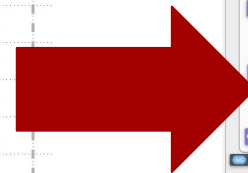
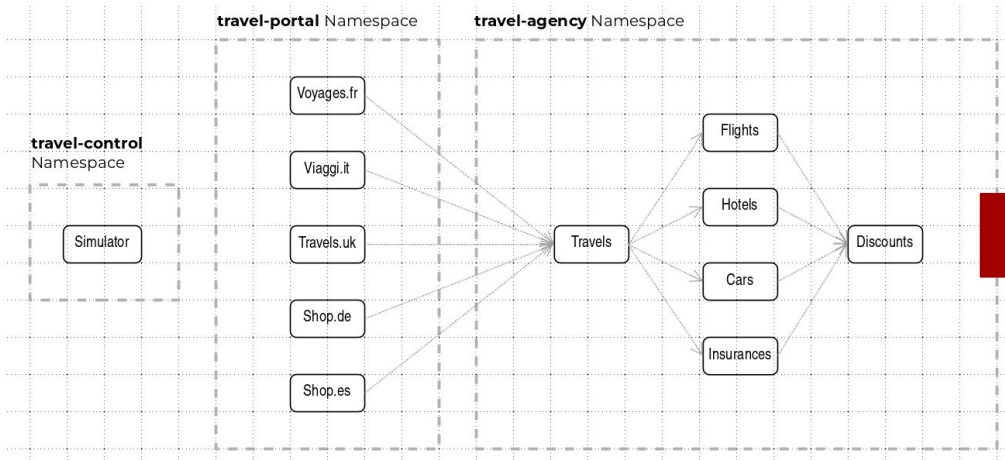
Module

Control Cloud Native Apps with Service Mesh

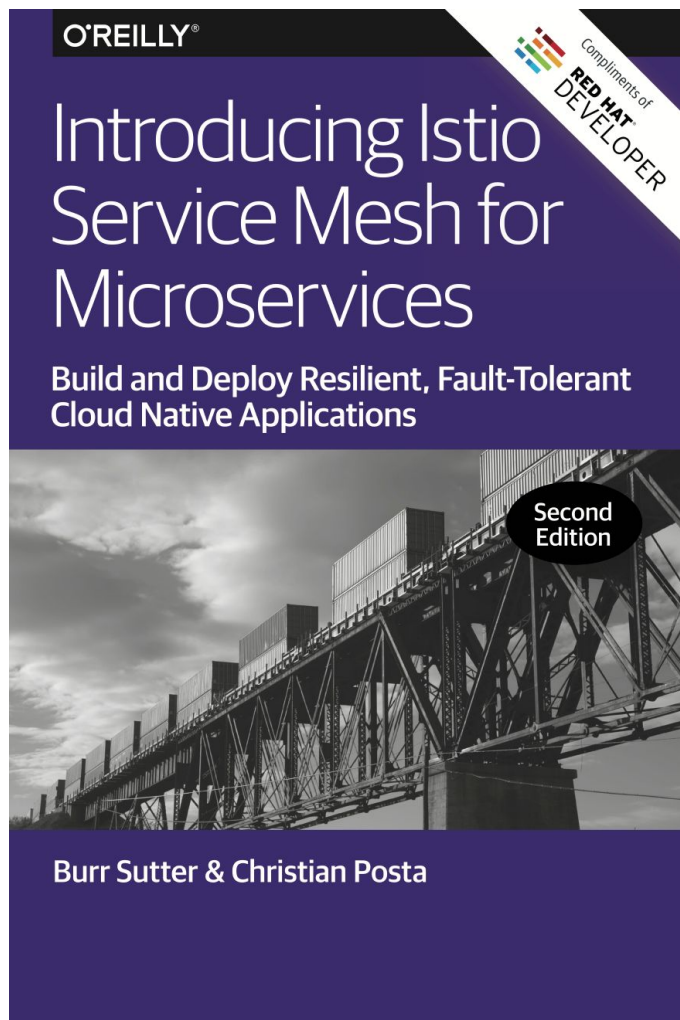
[OpenShift Console](#) | [CodeReady Workspaces Console](#)

# Multi Mesh Demo

A fully automated demo of Federation with OpenShift Service Mesh based on the KIALI [Travels Demo](#). The mesh will be federated over GCP and AWS deployed Openshift Clusters.



Try OSSM federation yourself with the [git repository](#)



## This book explains how to:

- Build more dependable software and deliver it faster than before.
- Create powerful and resilient cloud native applications.
- Improve traffic control, service resiliency, testing, observability, and the security of microservices.

# Keep Going your Service Mesh Journey

[HTTPS://RED.HT/SERVICEMESH](https://red.ht/servicemesh)

## LEARNING SCENARIO

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Get familiar with Istio with an in-browser, guided tutorial

[Start scenario](#)

## E-BOOK

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Istio Service Mesh for  
Microservices

[Download e-book](#)

## INTERESTED IN API MANAGEMENT?

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Learn about the similarities and differences between API management and service mesh approaches, when to choose one over the other, and how to set up a comprehensive service management architecture using both solutions together.

[Download e-book](#)



# Not Enough?

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KUBERNETES LEARN BY EXAMPLE ▶ PLAY ALL

KUBERNETES LEARN BY EXAMPLE #9	KUBERNETES LEARN BY EXAMPLE #8	KUBERNETES LEARN BY EXAMPLE #7	KUBERNETES LEARN BY EXAMPLE #6	KUBERNETES LEARN BY EXAMPLE #5	KUBERNETES LEARN BY EXAMPLE #4
Persistent Volumes	ConfigMaps	Managing Secrets	DaemonSet	StatefulSets	Deployment and ReplicaSet
10:31	6:45	7:12	7:00	8:54	11:44
Persistent Volumes - Learn by Example [9]	ConfigMaps - Learn by Example [8]	Managing Secrets - Learn by Example [7]	DaemonSet - Learn by Example [6]	StatefulSets - Learn by Example [5]	Deployment and ReplicaSet - Learn by Example [4]
Daniel Oh 11 views · 1 day ago	Daniel Oh 124 views · 2 weeks ago	Daniel Oh 115 views · 1 month ago	Daniel Oh 110 views · 1 month ago	Daniel Oh 137 views · 2 months ago	Daniel Oh 125 views · 2 months ago

QUARKUS ▶ PLAY ALL

Microsweeper Quarkus on Red Hat OpenShift Service on AWS	Build your first Java Serverless Function using Quarkus Quick start	Microsweeper Quarkus on Azure Red Hat OpenShift	Getting Started with Reactive Programming with Kotlin on...	Cloud Native Buildpacks with Quarkus	Extend Service Discovery with Quarkus and Stork
19:21	9:55	18:57	5:09	11:16	
Microsweeper Demo with Quarkus on Red Hat...	Build your first Java Serverless Function using...	Microsweeper Demo with Quarkus on Azure Red Hat...	Getting Started with Reactive Programming with Kotlin on...	Cloud Native Buildpacks with Quarkus	Extend Service discovery with Quarkus and Stork
Daniel Oh 5 views · 6 minutes ago	Daniel Oh 74 views · 5 days ago	Daniel Oh 119 views · 11 days ago	Daniel Oh 125 views · 3 weeks ago	Daniel Oh 141 views · 1 month ago	Daniel Oh 157 views · 1 month ago

SERVERLESS & FUNCTION ▶ PLAY ALL

Build your first Java Serverless Function using Quarkus Quick start	Drag and Drop your Quarkus App on the Developer Sandbox	Your new Cloud-Native application is ready!	DEMO	Your new Cloud-Native application is ready!	Hybrid Serverless Development using Quarkus
9:55	6:18	12:47	15:41	12:47	34:56
Build your first Java Serverless Function using...	Drag and Drop your Quarkus Serverless App on the...	Deploying Multiple CloudNative Apps with...	Quarkus builds your AWS Lambdas	Deploying Multiple Cloud Native Apps with OpenShift...	Hybrid Serverless Development using Quarkus

# Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.



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