
cisco Live!
TURN
IT
UP
#CiscoLive

The bridge to possible

Meshing with your Mess

Shannon McFarland – CCIE#5245
Distinguished Engineer
@eyepv6

BRKCLD-2088

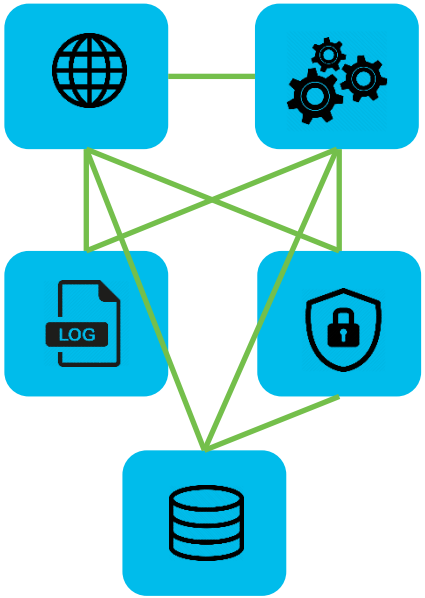
Agenda

- The Service Mess
- What is a Service Mesh and why do I want one?
- A Service Mesh Example - Linkerd
  - How do I get it?
  - Contributing to Linkerd
- Deploying Meshes on Cisco Container Platform (CCP) and Cisco Intersight Kubernetes Service (IKS)

The Service Mess

What's a Microservice?

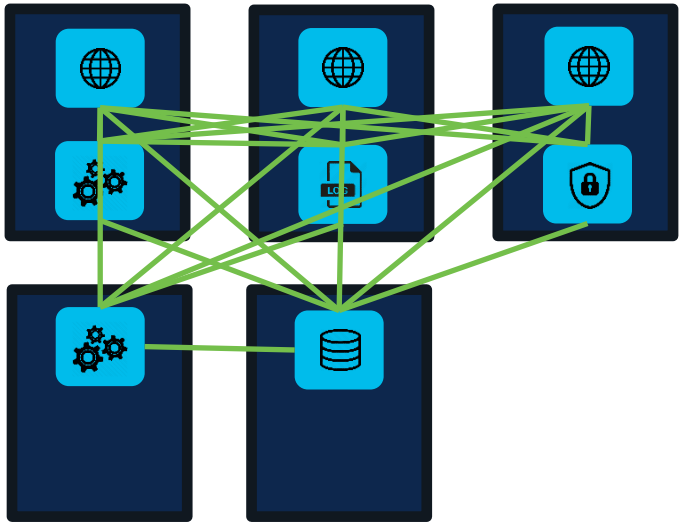
Monolithic Application



Microservice Application

Scaling a Microservice Application

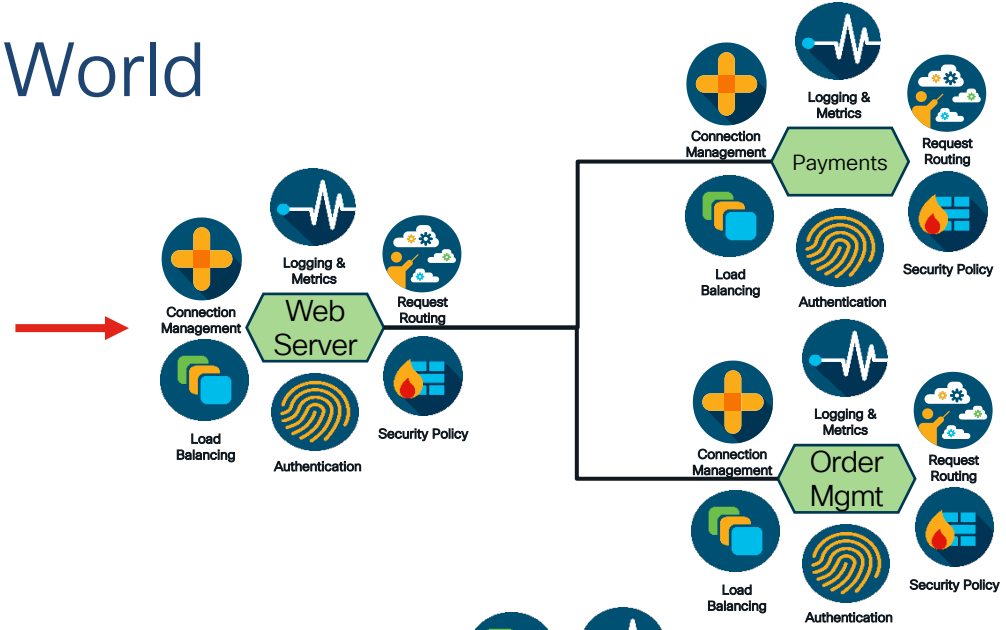
Monolithic Application



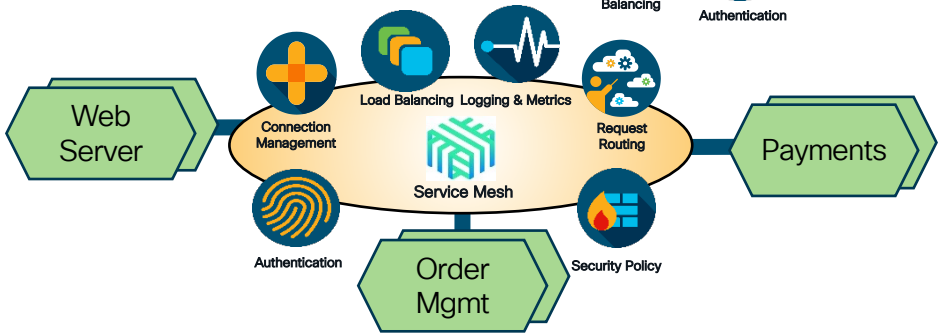
Microservice Application

Service Features in a Microservice World

- Deploy all the service features as independent components



- Offload features for service-to-service communication to a policy-driven secure service mesh

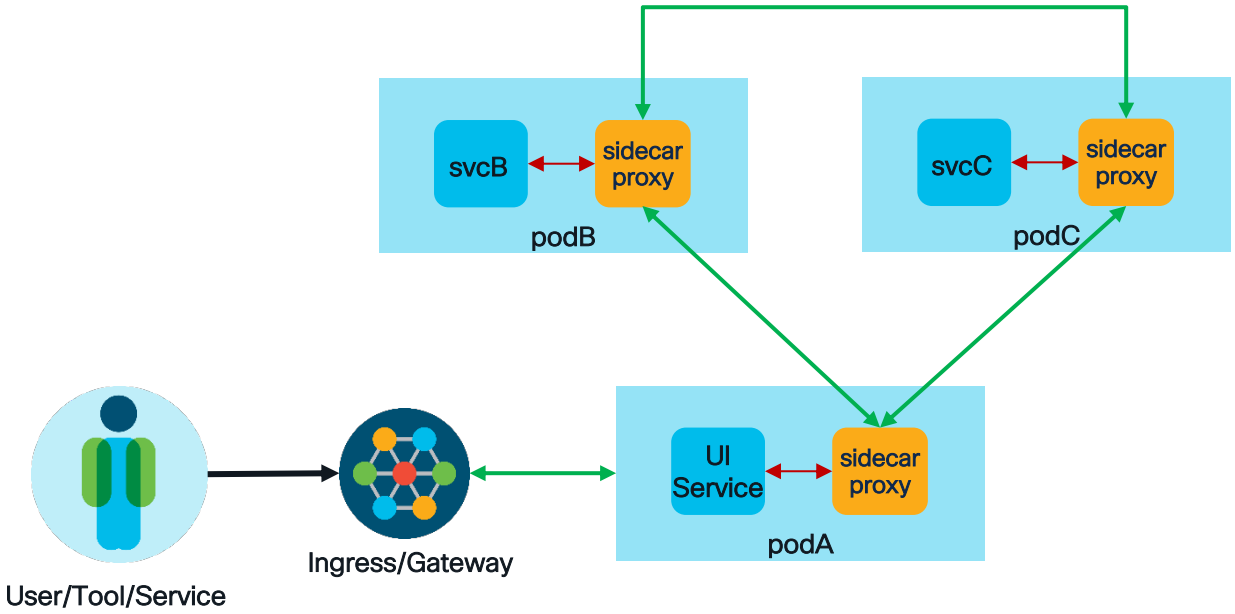


My Application Service Requirements

- I want to deploy a microservice
- I want to deploy using Kubernetes
- I have a bunch of requirements such as the need to handle:
  - Service failures
  - Retries
  - Circuit breaking
  - Topology changes
  - Monitoring
  - Tracing
  - Encryption between services
  - and more

What is a Service Mesh?

What is a Service Mesh?



- Infrastructure layer for service-to-service communication
- Can use a mesh of sidecar proxies:
  - Can inspect API transactions at Layer 7 and 4 (TCP)
  - Intelligent routing rules can be applied between endpoints

Service Mesh Options
There are many

- Application Service Meshes (L4/7)
  - https://linkerd.io/ (CNCF)
  - https://istio.io/
  - https://www.hashicorp.com/products/consul/service-mesh
  - and others...
- Network Service Mesh (L2/3)
  - https://networkservicemesh.io/
- Service proxies, API gateways, etc... (A search engine is your friend)

A Service Mesh Example – Linkerd

Istio Version: https://www.ciscolive.com/
Search for “devnet-2022” or
https://www.ciscolive.com/global/on-demand-library.html?search=devnet-2022#/session/1564527385709001cqFz

cisco Live!

An open source **service mesh** and CNCF project.

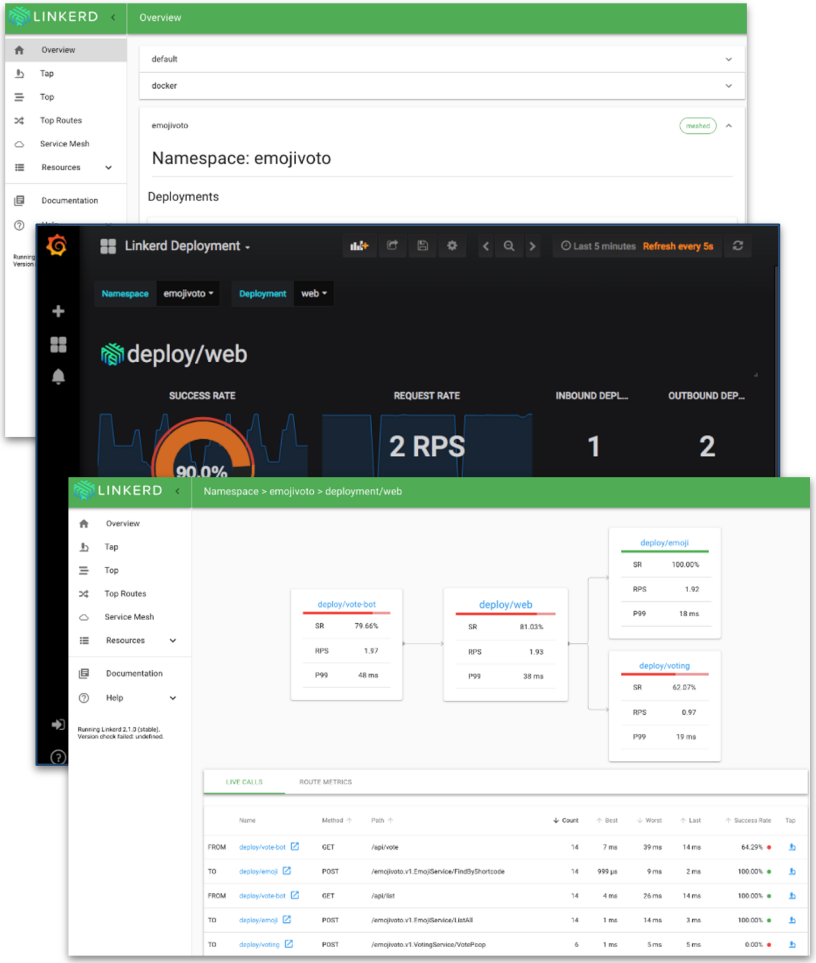
- 🔥 **4 years** in production
- 🔥 **5,000+** Slack channel members
- 🔥 **10,000+** GitHub stars
- 🔥 **100+** contributors

GoDaddy
Walmart
STRAVA
BIGCOMMERCE
Expedia
OfferUp
H-E-B
Cisco webex
Clover Health
planet.

What does it do?

- Observability: Service-level *golden metrics*: success rates, latencies, throughput. Service topologies.
- Reliability: Retries, timeouts, load balancing, circuit breaking
- Security: Transparent mTLS, cert management and rotation, policy

In an ultralight package focused on operational simplicity first and foremost.

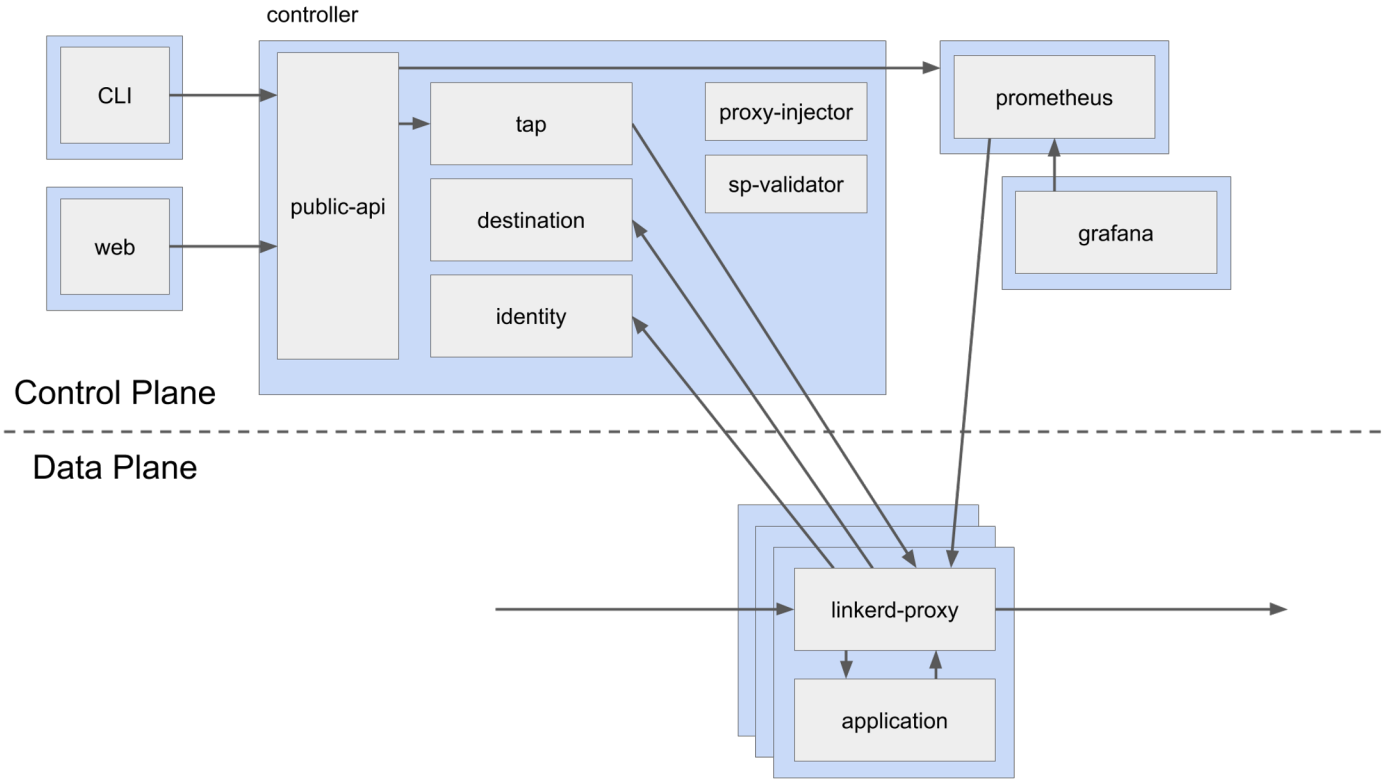


Linkerd Design

- In short, "do less, not more"
- Just works: Zero config, out of the box, for any Kubernetes app
- Ultralight: Introduce the bare minimum perf and resource cost
- Simple: Reduce operational complexity in every possible way
- Minimal overhead:
  - Control plane: Go. ~200mb RSS (excluding metrics data). (Repo: linkerd/linkerd2).
  - Data plane: Rust. <10mb RSS (Resident Set Size), <1ms p99 (Repo: linkerd/linkerd2-proxy)

https://linkerd.io/2/reference/architecture/

Linkerd 2.x Architecture



Linkerd: How Do I Get It?

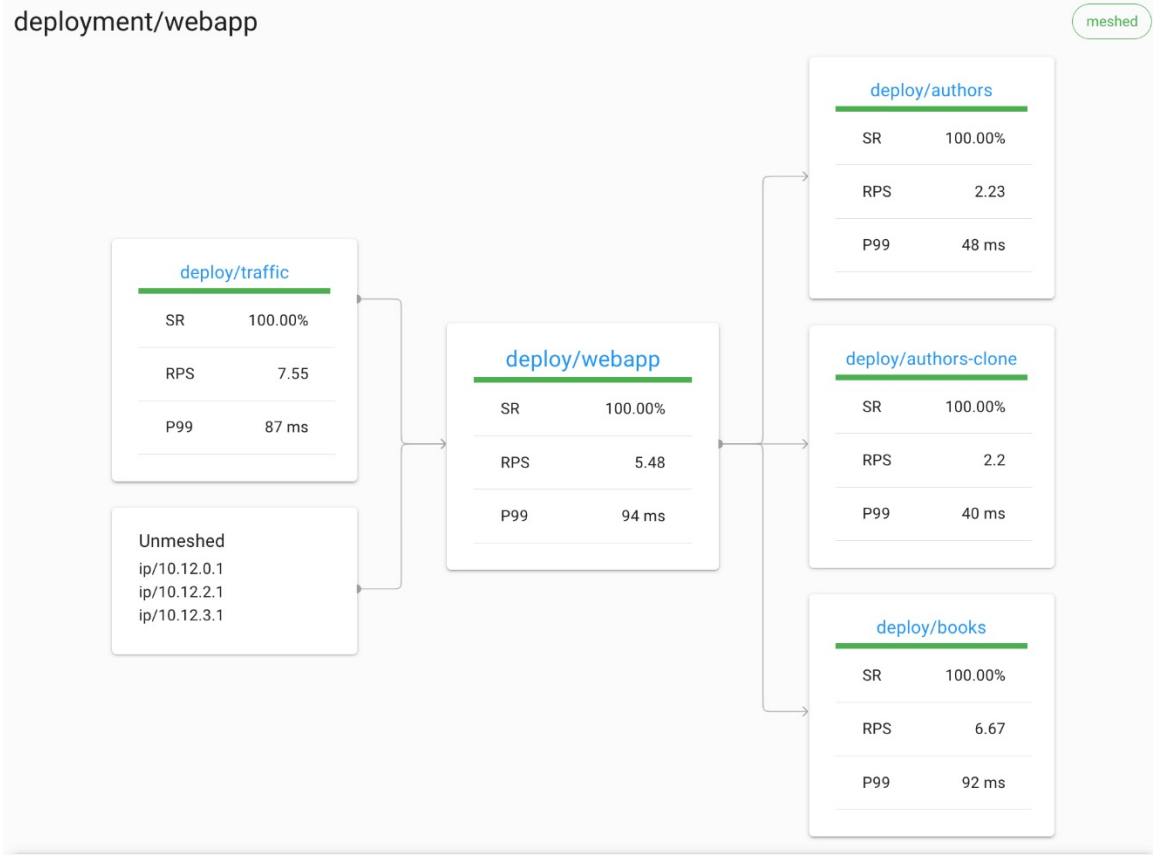
Linkerd: How Do I Get It?

- Where to get it:
  - https://linkerd.io/2/getting-started/
  - Releases: https://github.com/linkerd/linkerd2/releases/
- Deploy a Kubernetes Cluster
- Deploy Linkerd
- Deploy (or add) Linkerd to your microservice(s)

Demo

Sample App – Booksapp

https://github.com/BuoyantIO/booksapp



Contributing to Linkerd

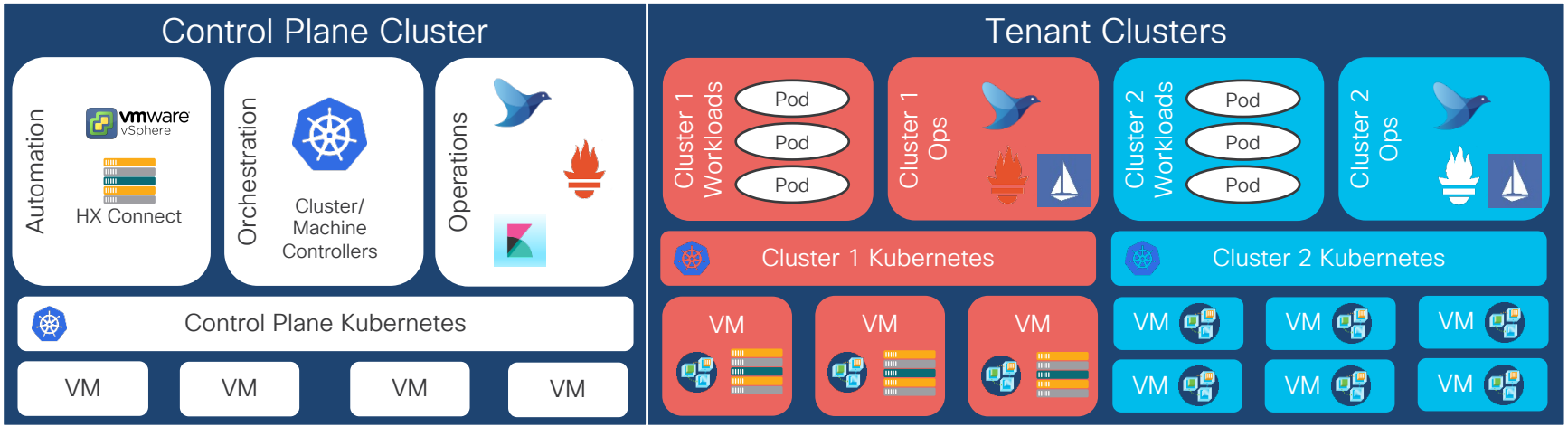
Get involved!

- Linkerd has a friendly, welcoming community! Join us!
- Development is all on https://github.com/linkerd
- Thriving community in the https://slack.linkerd.io/
- Formal announcements on the CNCF https://lists.cncf.io/g/cncf-linkerd-users
- Linkerd is 100% Apache v2 licensed, owned by a neutral foundation (https://www.cncf.io/), and is https://linkerd.io/2019/10/03/linkerds-commitment-to-open-governance/.

Deploying Meshes on Cisco Container Platform (CCP) and Intersight Kubernetes Service (IKS)

cisco Live!

Cisco Container Platform



Hypervisor Layer (HyperFlex / VMware)

Compute Hardware (HyperFlex, UCS, or 3rd Party Server)

Networking (Nexus 9K or other)

Kubernetes Fluentd Prometheus Kibana Hyperflex CNI Istio

Intersight Kubernetes Service (IKS)

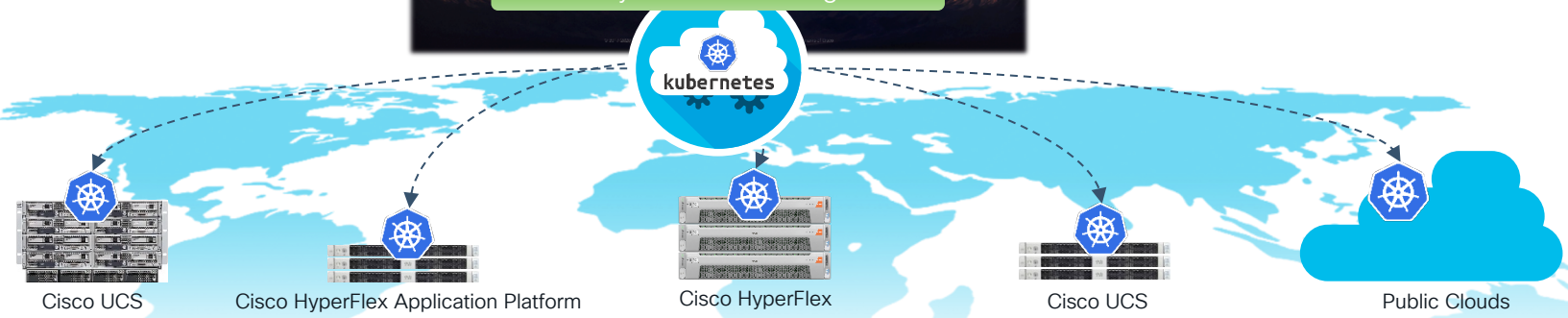
Cloud / Connected / Air-gapped

Deploy

enterprise-ready Kubernetes clusters from the cloud in minutes

Manage

the life-cycle of Kubernetes clusters across the globe from a single cloud portal



- Bare Metal Support
- Multi-Hypervisor Support
- Data Center | Edge | Cloud

Cisco CCP and IKS Reference

- Cisco CCP: https://www.cisco.com/c/en/us/products/cloud-systems-management/container-platform/index.html
- Cisco IKS: https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/intersight/at-a-glance-c45-744332.html

It's About The Application... Not The Infrastructure

- Service Meshes provide injection of proxy sidecars along with each microservice
- Injection is secure and automatic
- Allows the application developer to focus on the application
- The proxy sidecar connects cleanly to the microservice without additional development and regardless of the language used by the microservice
- Off-loads the authentication, authorization, telemetry (logs, metrics, tracing etc.), and network connectivity responsibilities
- Provides uniformity in both policy enforcement and telemetry collection

The bridge to possible

Thank you


cisco Live!
TURN
IT
UP
#CiscoLive