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The bridge to possible

Securing & deploying Cloud Native apps in a Hybrid Cloud

Using Intersight Kubernetes Service and Service Mesh Manager

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BRKCLD-3702



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Cisco Webex App

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How

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Webex spaces will be moderated by the speaker until June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCLD-3702>



Cloud Migrations

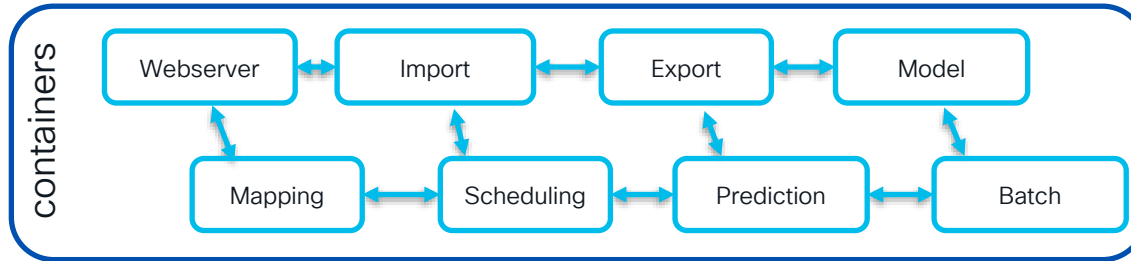


“Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds”



CLOUD NATIVE
COMPUTING FOUNDATION

Cloud Native Architecture

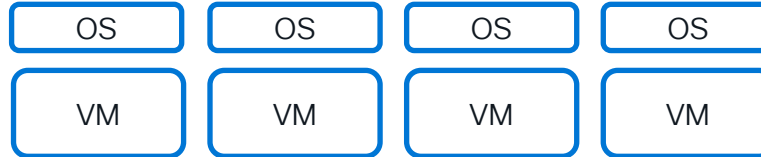


CI/CD

container
registry

build server

Kubernetes



Virtualization

Physical Infra



LEO Analytics



Multi-Cloud



High available & scalable



Increased operational
efficiency & agility

Cloud Native landscape.cncf.io

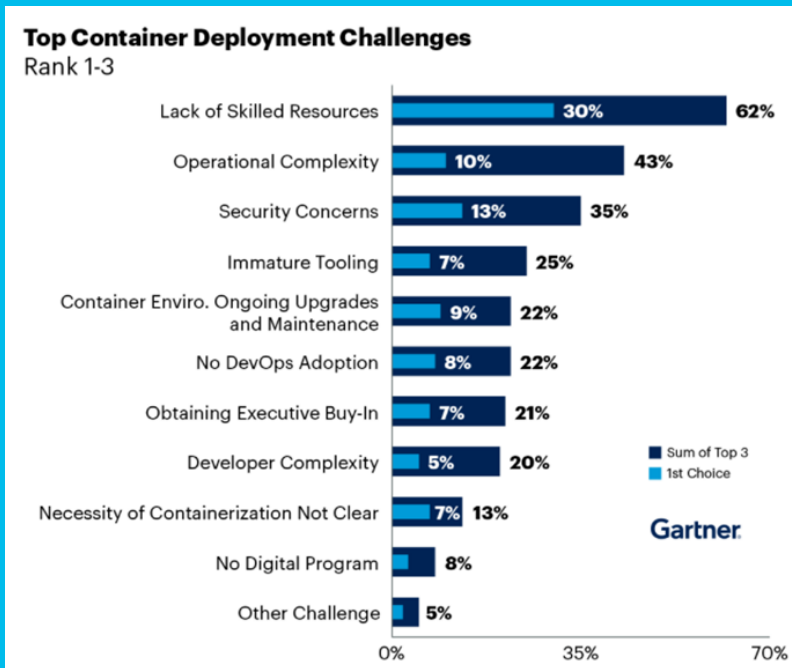
The main grid displays a wide array of CNCF projects categorized into several functional areas:

- Database:** Includes KV, Vitess, CockroachDB, YugabyteDB, and others.
- Streaming & Messaging:** Includes cloudevents, NATS, and others.
- Application Definition & Image Build:** Includes HELM, Buildpacks.io, and others.
- Continuous Integration & Delivery:** Includes argo, flux, and others.
- Scheduling & Orchestration:** Includes kubernetes, Cosmashare, and others.
- Coordination & Service Discovery:** Includes CoreDNS, etcd, and others.
- Remote Procedure Call:** Includes gRPC, and others.
- Service Proxy:** Includes envoy, and others.
- API Gateway:** Includes KONG, and others.
- Service Mesh:** Includes LINKERD, and others.
- Cloud Native Storage:** Includes ROOK, LONGHORN, and others.
- Container Runtime:** Includes cri-o, and others.
- Cloud Native Network:** Includes cilium, CNI, and others.
- Automation & Configuration:** Includes KubeEdge, and others.
- Container Registry:** Includes Harbor, and others.
- Security & Compliance:** Includes Falco, and others.
- Key Management:** Includes spiffe, and others.

This section focuses on tools for monitoring, logging, tracing, and chaos engineering:

- Monitoring:** Includes Prometheus, Thanos, and others.
- Logging:** Includes fluentd, and others.
- Tracing:** Includes OpenTelemetry, and others.
- Chaos Engineering:** Includes Chaos Mesh, and others.
- Serverless:** Includes a section for serverless frameworks and providers.

Challenges



Gartner Market Guide for Container Management
February 2021

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Solution



Fully Automated



Delivered as-a-Service

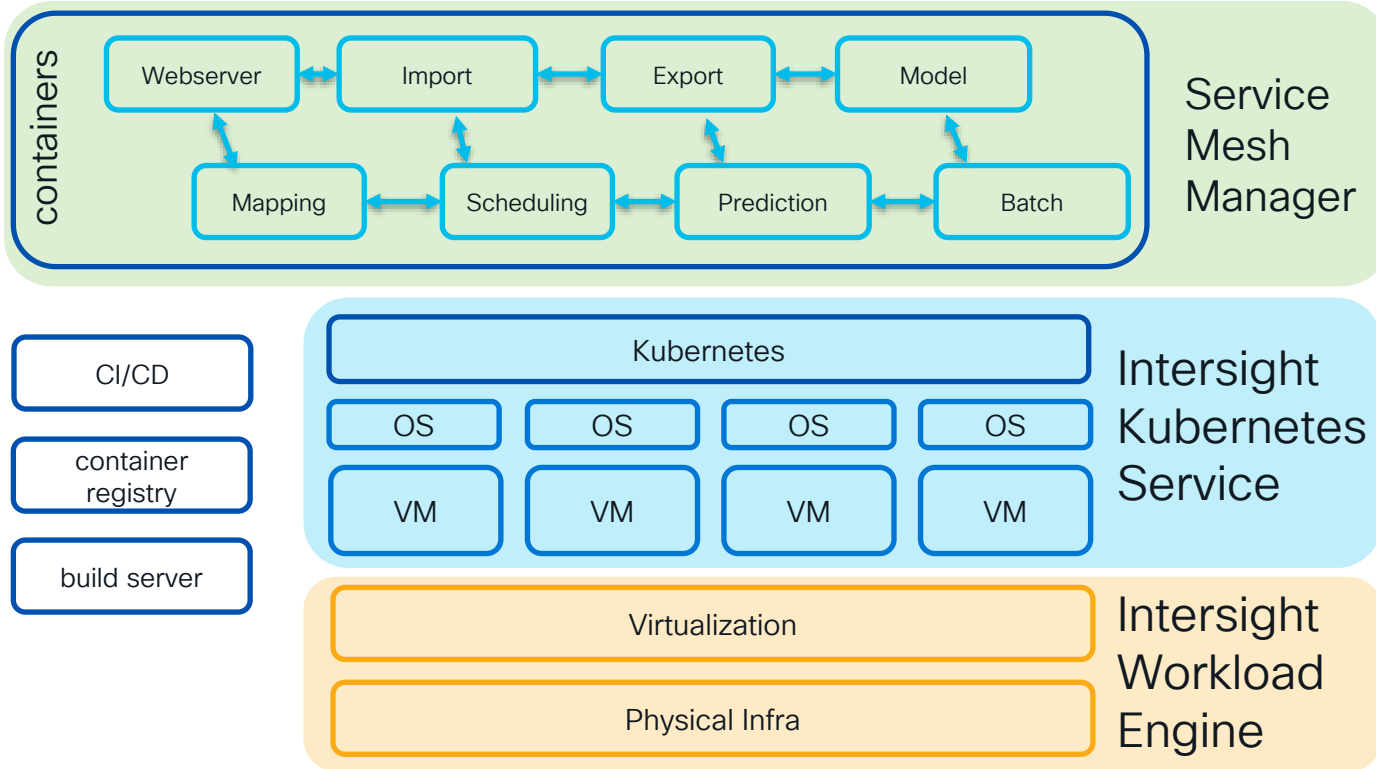




Curated & Secured



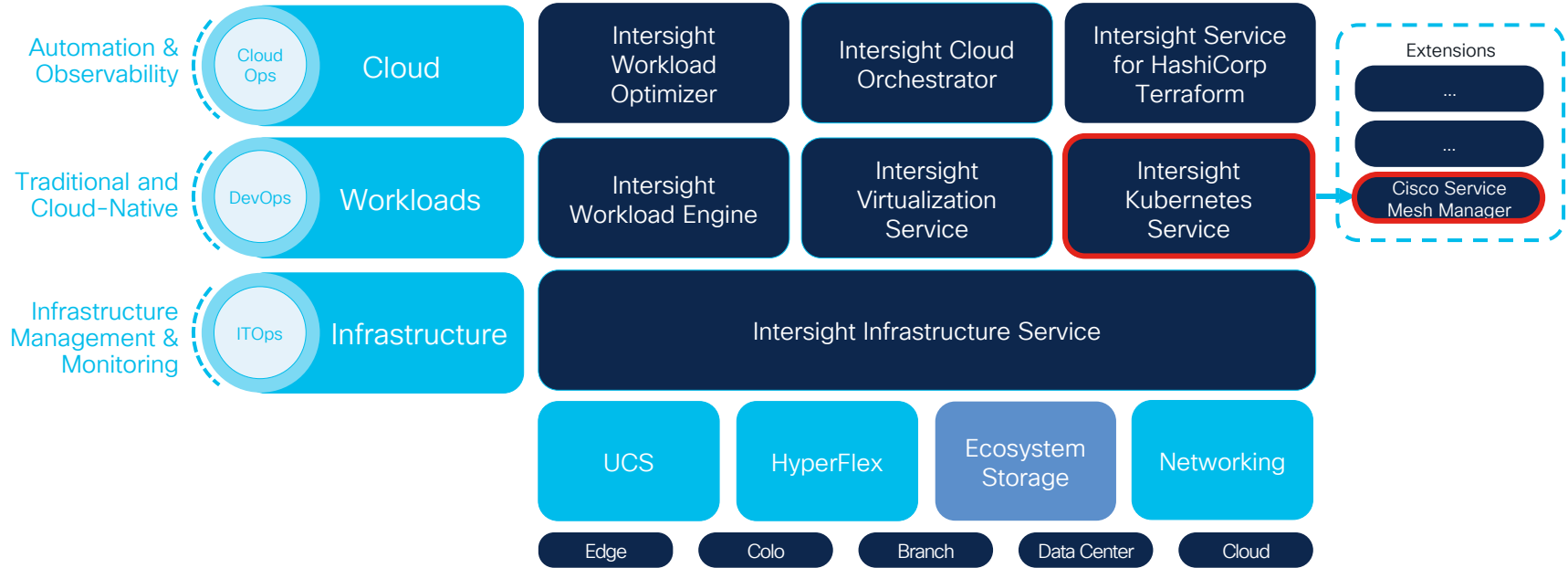
*“Cloud is an **operating model**
not a destination”*

Intersight delivering a Cloud Native Solution



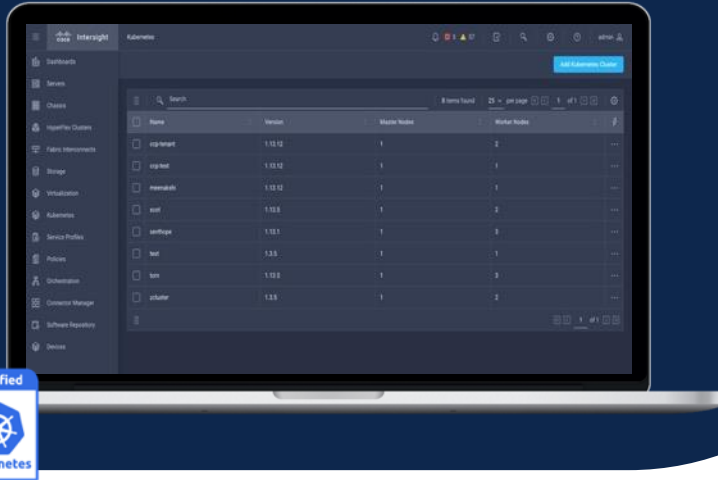
-  Fully Automated
-  Delivered as-a-Service
-  Curated & Secured

Intersight Hybrid Cloud Platform



Cisco Intersight Kubernetes Service

Operationalize production-grade Kubernetes with a turn-key, flexible platform



Native Kubernetes – 100% Upstream
Production Grade: hardened, secure, robust

Validated Out-of-the-box Container Interfaces
Networking | Storage | Load balancing

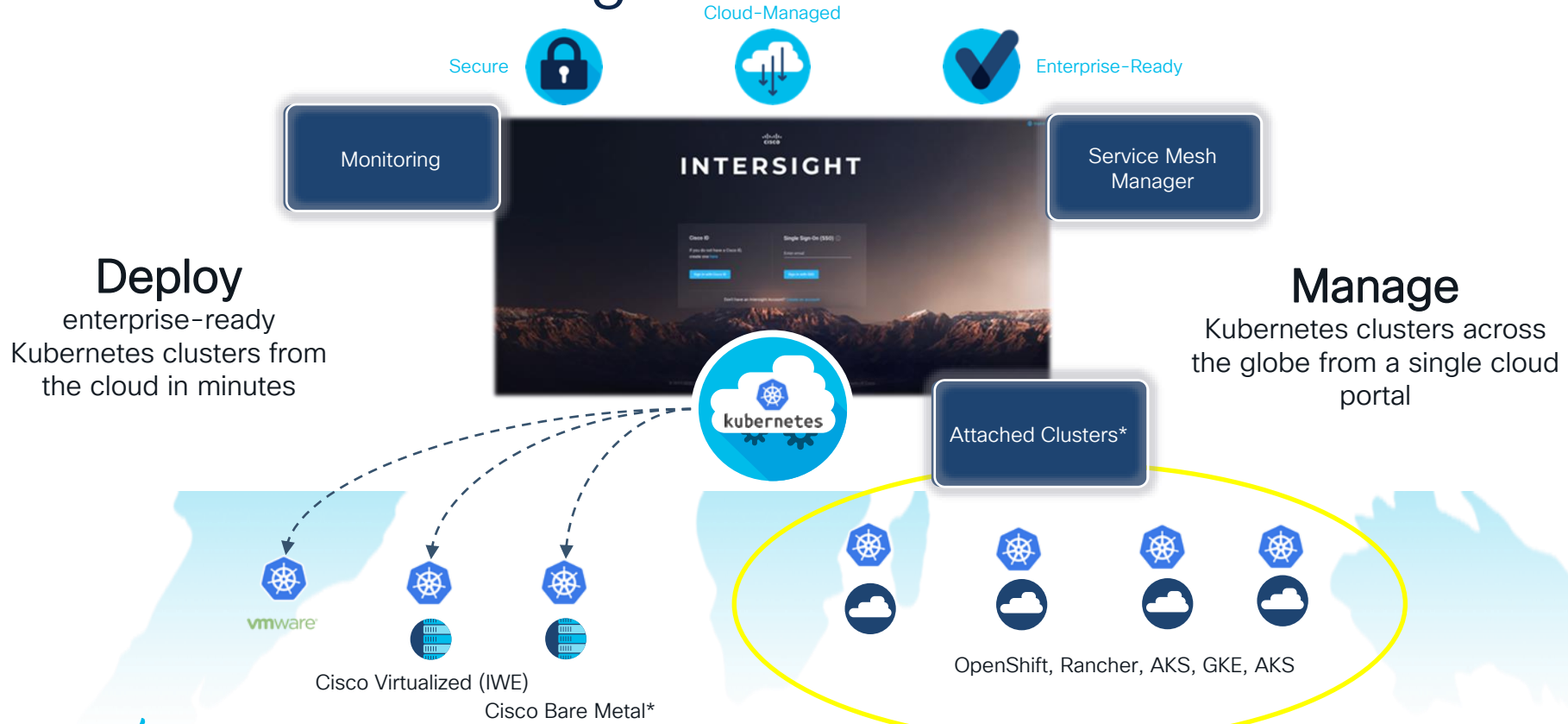
Curated Add-ons (open source and 3rd-party)
Monitoring | Service Mesh

Simplify Kubernetes day 0 to day N
operations anywhere

More value with multiple options
(hypervisors, storage and bare metal)

Reduce risk and cost with a security-
hardened, highly-available platform

Multi Cluster Management

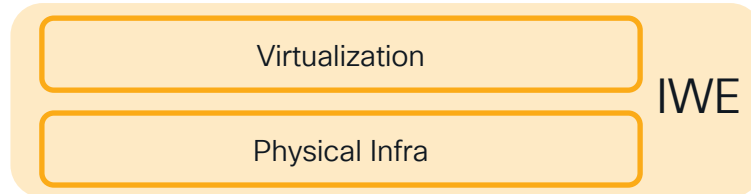
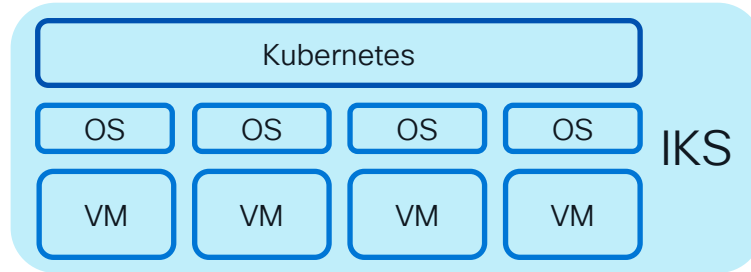
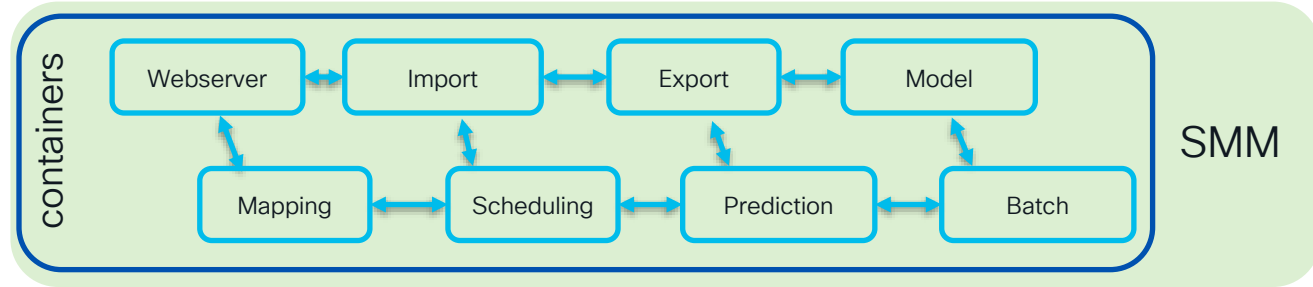


Intersight Kubernetes Service DEMO

Hybrid Cloud Use Cases



LEO Analytics



Cost Efficiency



Compliance

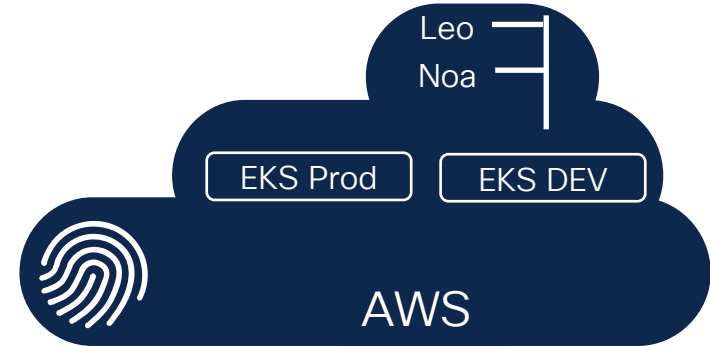
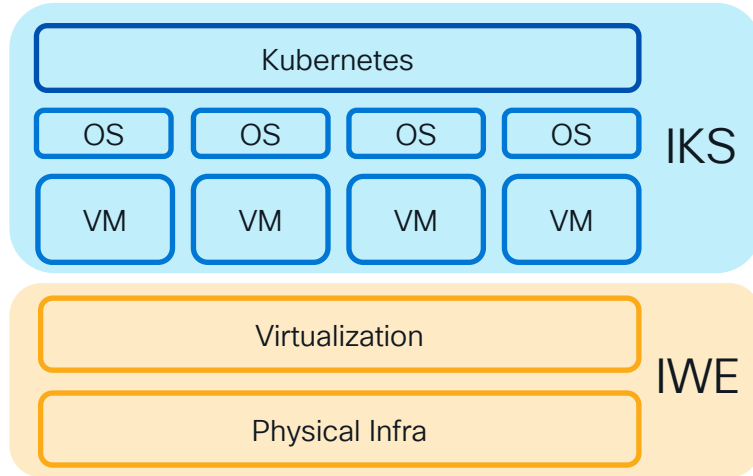
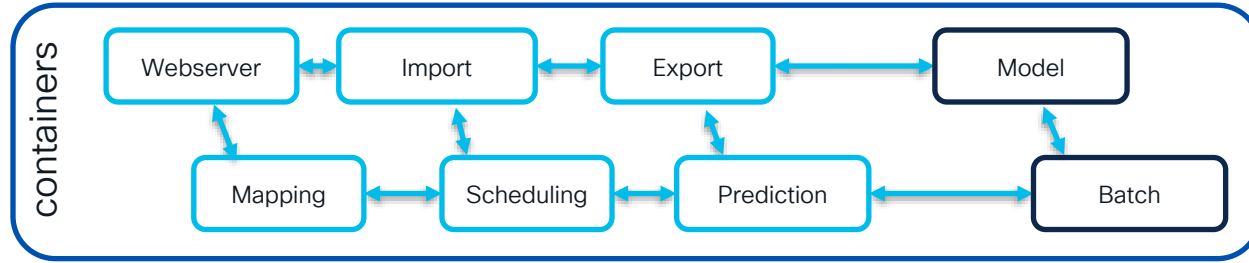


Application Resiliency

Hybrid Cloud Challenges | Stretched Applications



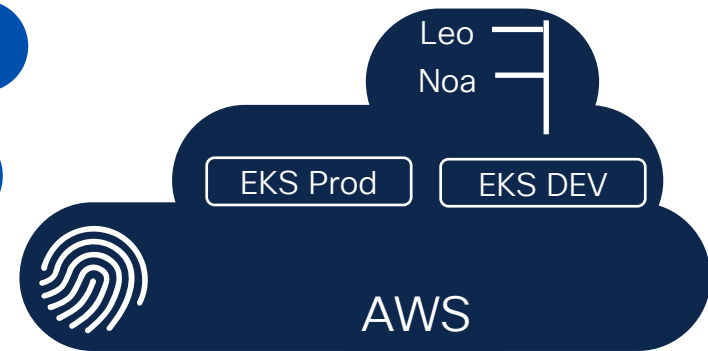
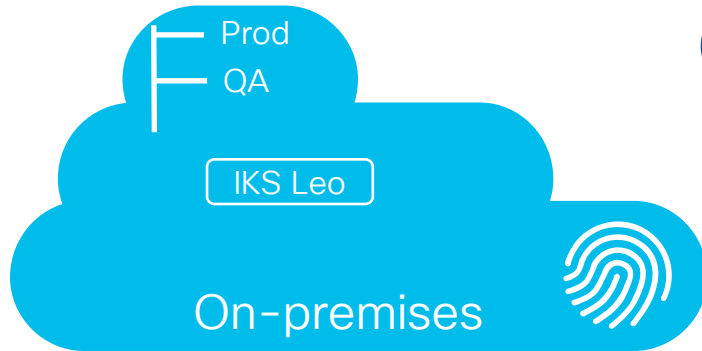
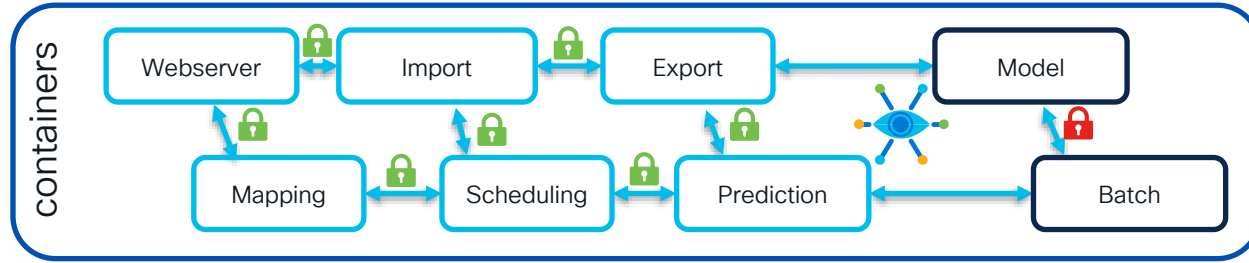
LEO Analytics



Hybrid Cloud Challenges | Stretched Applications



LEO Analytics



Hybrid Cloud Solutions



LEO Analytics

SMM

Application Portability
Consistent Policies



NOA Planning

Prod
QA

IKS Leo

On-premises



Consistent Policies
Multi-cluster IAM

Lou
Noa

EKS Prod

EKS DEV

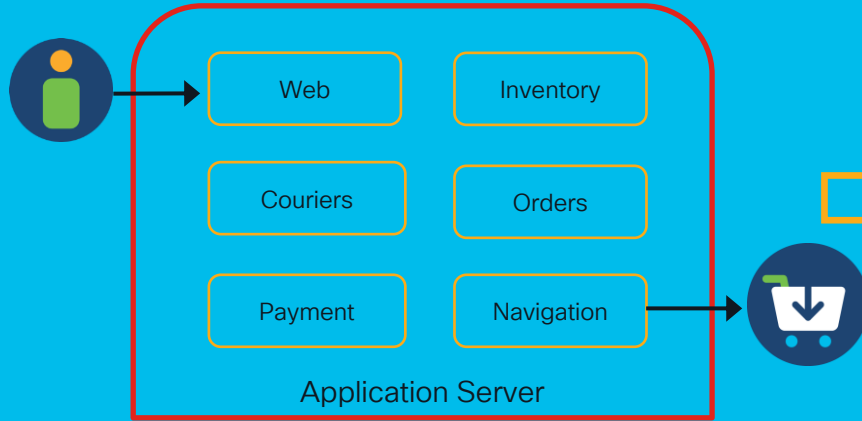
AWS



Service Mesh Manager (SMM)

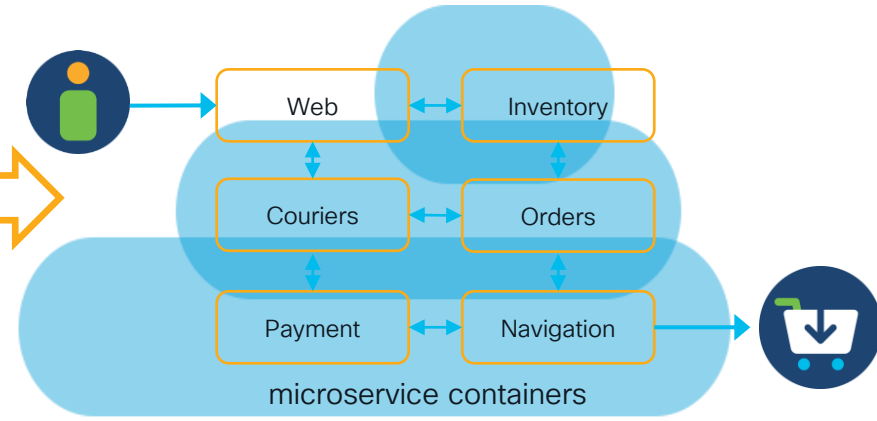


Monolithic App



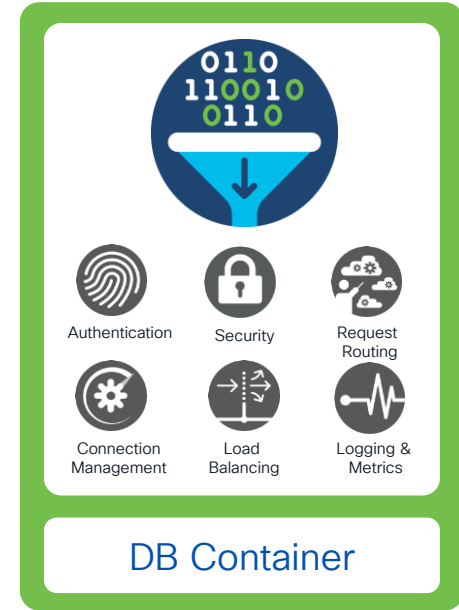
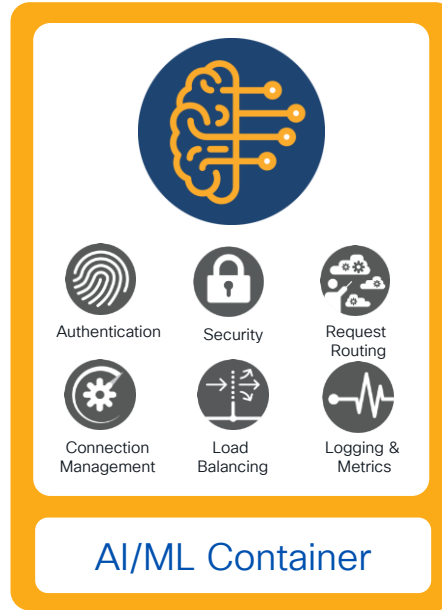
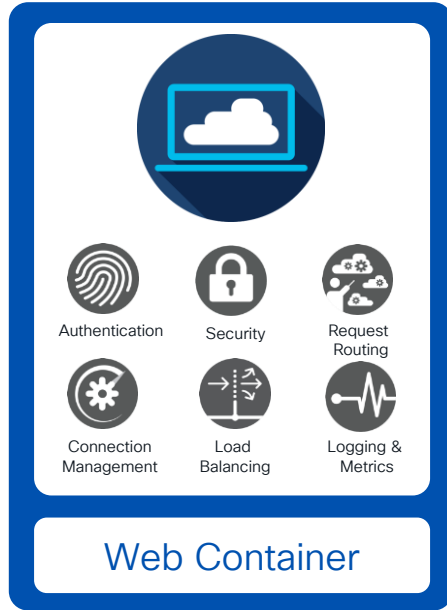
- ✓ Reliable RPC between processes
- ✓ Secure in-host connectivity
- ✓ Predictable latency
- ✓ SDK debugging

Cloud Native App



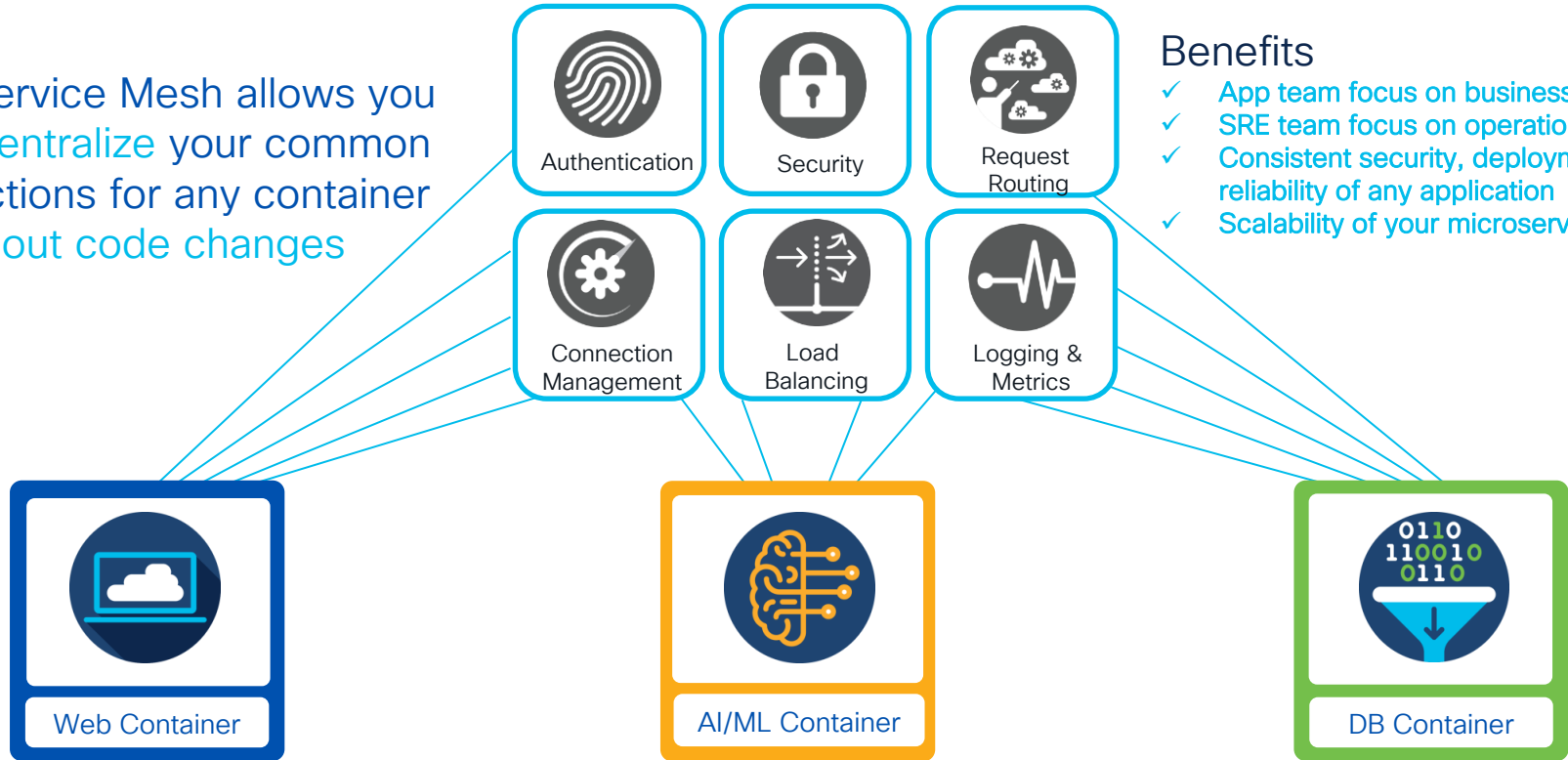
- ! Unreliable REST API calls
- ! Unsecure network traffic
- ! Unpredictable latency
- ! More places to troubleshoot

Microservice Common Functions



Service Mesh

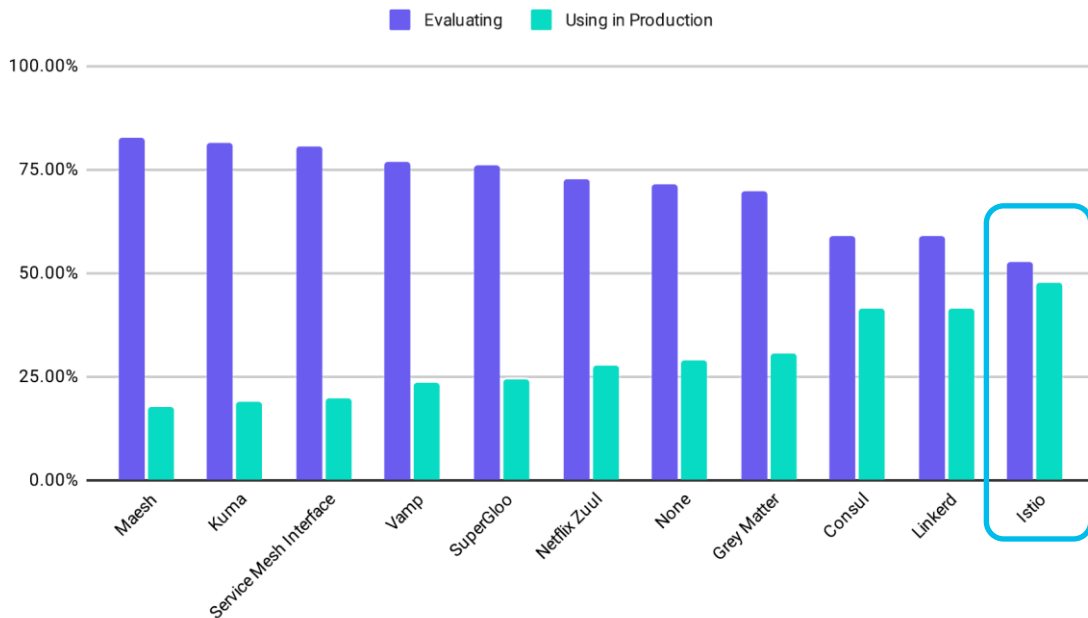
A Service Mesh allows you to **centralize** your common functions for any container without code changes



Service Mesh Landscape

47% of CNCF survey respondents use Istio as service mesh in production

Please indicate if your company/organization is evaluating, or currently using in production, any of these service mesh projects / products.

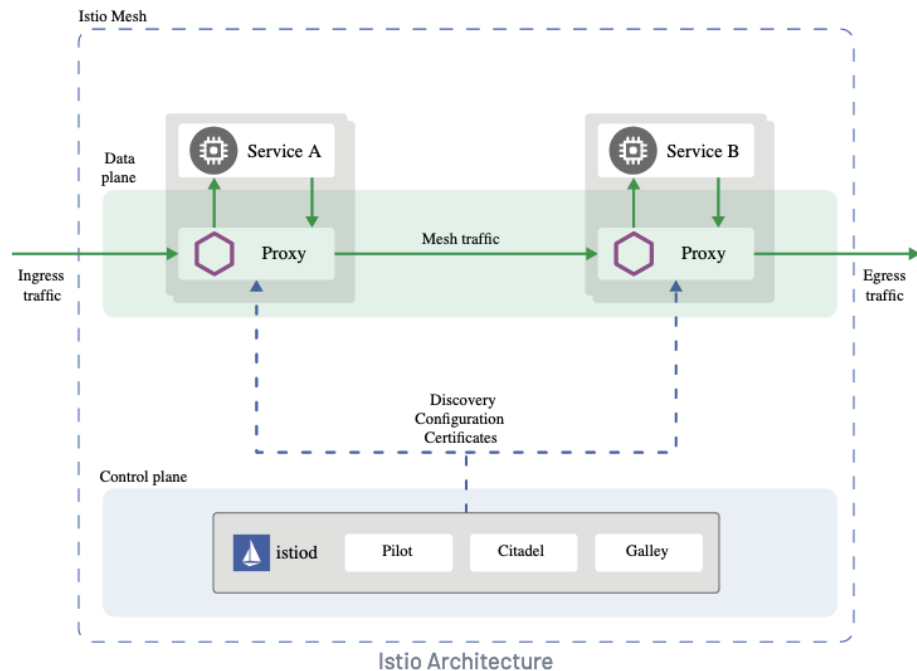


Source: Nov 17th 2020, [CNCF 2020 Survey](#)

Istio

Istio service mesh is split in a control plane which is called istiod and a data plane that is enabled with a sidecar proxy.

Envoy is the sidecar proxy and is used for intercepting traffic and adding functionality like Traffic Management, Observability and Security



source: <https://istio.io/latest/docs/ops/deployment/architecture/>

Cisco Service Mesh Manager (SMM)

Operationalize the service mesh

Multi-cloud, multi-cluster observability
Connect any on-prem and public cloud together

Simplifies service mesh management
Single pane of glass, in depth metrics

Policy-based app networking & security
Policy management for DevOps practises

NEW



Introducing extensions
for InterSight Kubernetes Service

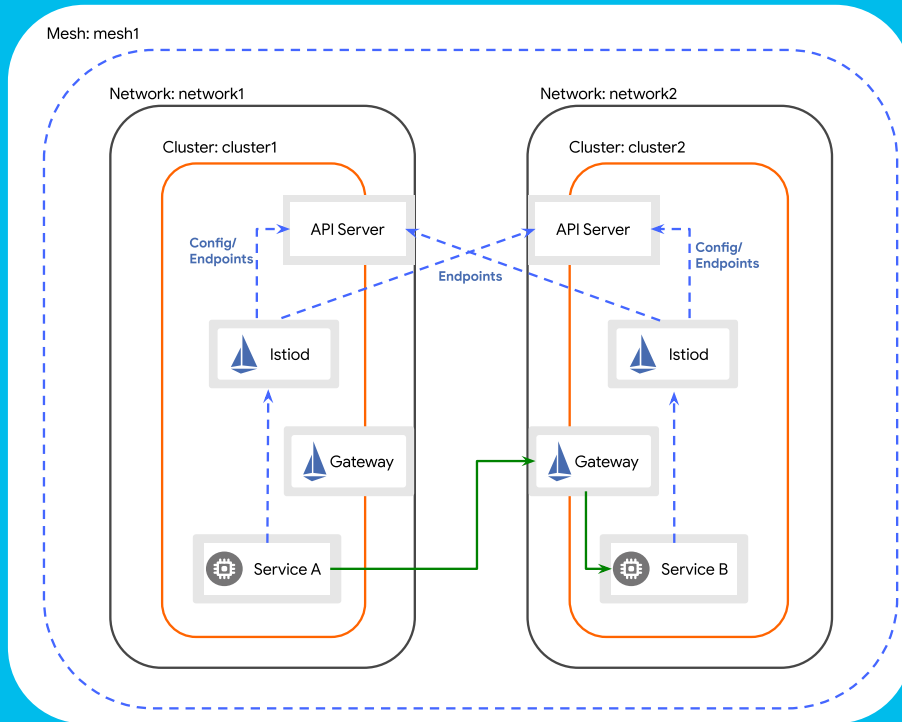
Traffic management ensures
smooth app updates

Complete application and
health observability

Security at all layers between
clusters and clouds

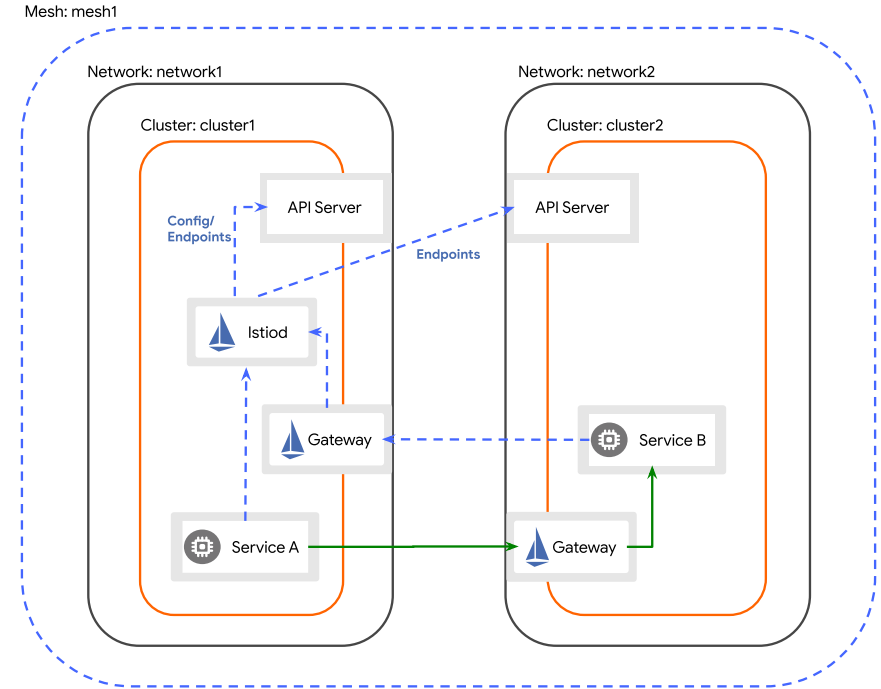
Multi Cluster SMM

Multi-Primary



Different Networks

Primary-Remote

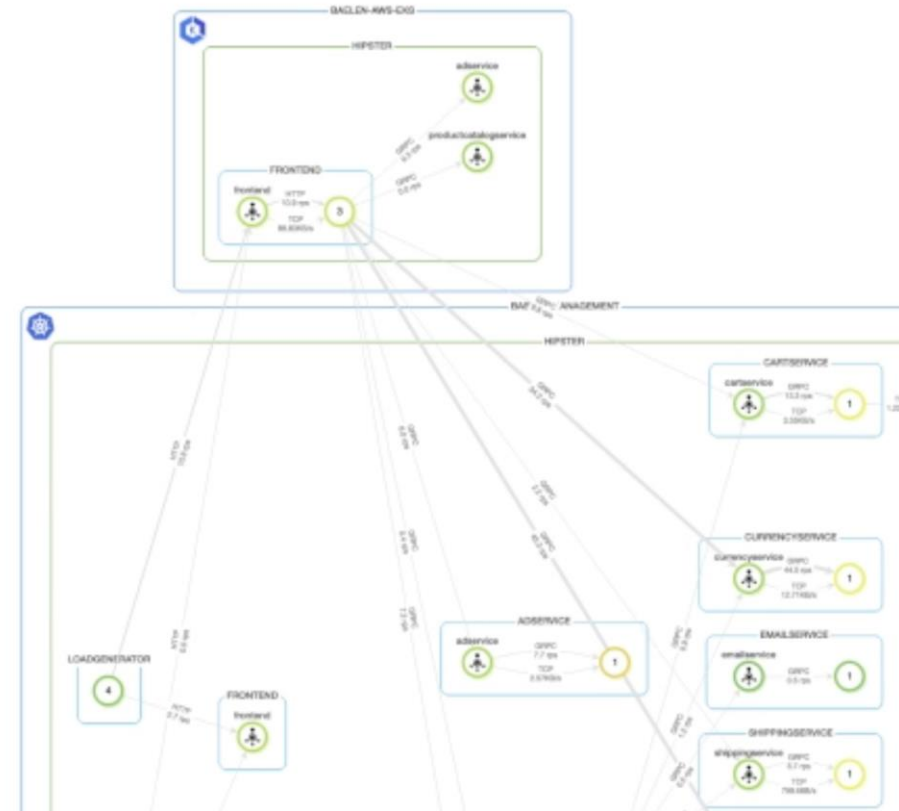


SMM Demo

Scaling out to the Cloud

Key take-away #1

Migrating Applications to the cloud is easy with Kubernetes and Istio



Key take-away #2

Intersight Kubernetes
Service brings
the cloud operating model
to on-premises

The screenshot displays the Intersight Kubernetes Service deployment wizard. On the left, a vertical navigation pane shows six steps: 1. General, 2. Cluster Configuration (highlighted in blue), 3. Control Plane Node Pool Configuration, 4. Worker Node Pools, 5. Add-ons Configuration, and 6. Summary. On the right, a modal window displays the status and details of the deployment. The status is 'Success', indicated by a green checkmark. Below the status, a table lists the deployment details.

Status	
Name	Deploy Kubernetes Cluster Profile
ID	6298d8df696f6e2d30720fc8
Target Type	Kubernetes Cluster Profile
Target Name	example-iks
Source Type	Kubernetes Cluster Profile
Source Name	example-iks
Initiator	admin@local
Start Time	Jun 2, 2022 11:35 AM
End Time	Jun 2, 2022 11:42 AM
Duration	6 m 29 s

Key take-away #3

SMM simplifies multi-cluster Servicemesh!

```
✓ cluster-registry > deployed successfully
✓ add-cluster-to-registry/baelen-management/reconcile-on-peer > done
✓ add-cluster-to-registry/baelen-aws-eks/reconcile-on-peer > done
✓ mesh-manager/prerequisites > done
✓ mesh-manager > configured successfully
✓ mesh-manager > reconciling
✓ mesh-manager/wait/readiness > done
✓ mesh-manager > deployed successfully
✓ istio/prerequisites > done
✓ istio > configured successfully
✓ istio > reconciling
✓ istio > reconciled
✓ istio > reconciling
✓ istio/wait/readiness > done
✓ istio > successfully deployed
✓ smm > configured successfully
✓ smm > reconciling
✓ smm/pre-checks > checking resource pre-conditions
✓ smm/pre-checks/istio-sidecar-injector > done
✓ smm/pre-checks > checking resource pre-conditions
✓ smm/wait/readiness > done
✓ smm > deployed successfully
✓ node-exporter > configured successfully
✓ node-exporter > reconciling
✓ node-exporter/pre-checks > checking resource pre-conditions
✓ node-exporter/pre-checks/node-exporter-namespace > done
✓ node-exporter/wait/readiness > done
✓ node-exporter > deployed successfully
✓ cluster successfully attached name=baelen-aws-eks
```

Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



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The bridge to possible

Thank you

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