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Kubernetes as Infrastructure Abstraction

Cloud-Native Implementation Strategy in an Enterprise Environment

Introductions



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CTO, Kublr

- ✓ 20+ years in software architecture & development
- ✓ Working w/ Kubernetes **since its release** in 2015
- ✓ **CTO at Kublr**—an enterprise ready container management platform
- ✓ Twitter **@olgch**; **@kublr**

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Kubernetes & Cloud Native in Restrictive/Enterprise Environments

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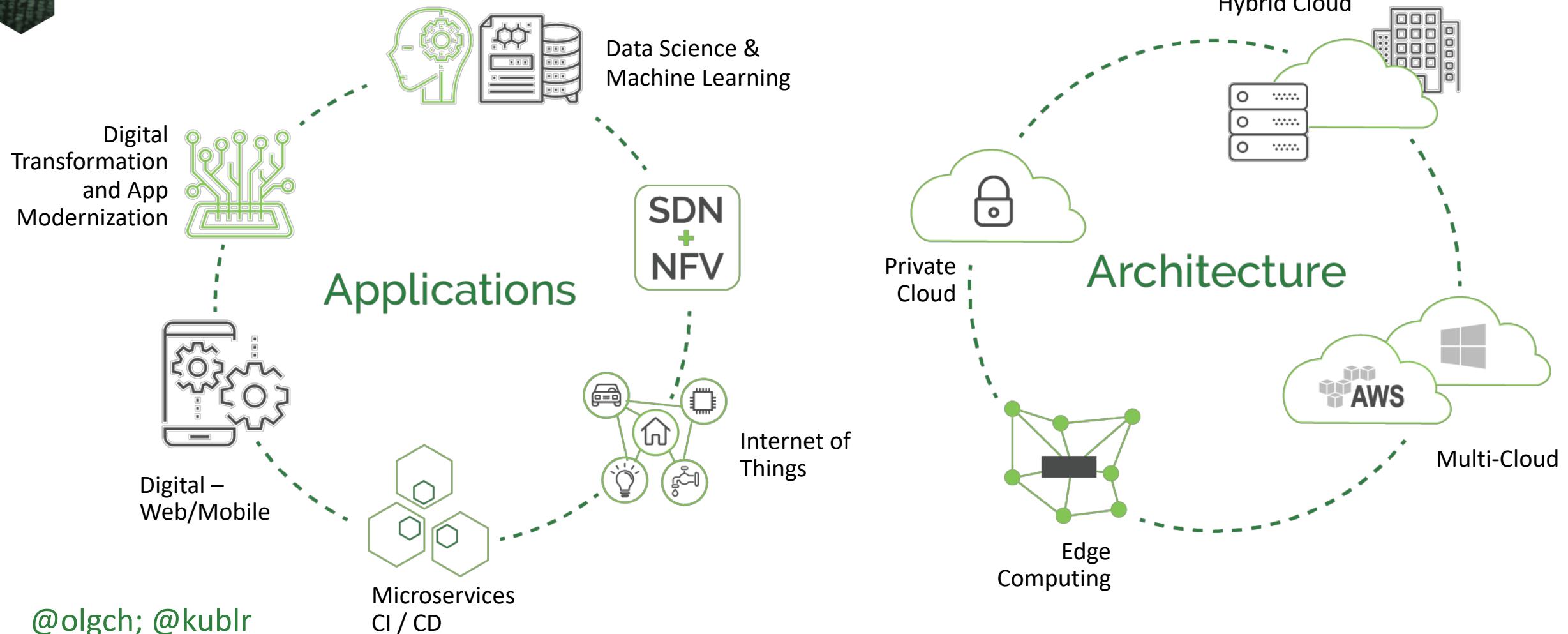
Cloud Native Attributes

- ✓ Lightweight containers
- ✓ Language agnostic
- ✓ Microservices
- ✓ API
- ✓ Stateless/stateful separation
- ✓ Self-service infrastructure
- ✓ Isolated from OS/server deps
- ✓ Agile DevOps processes
- ✓ Highly automated
- ✓ Declarative resource management





Applications & Architecture





Cloud Native

Cloud native precursors

- ✓ SRE, DevOps, 12factor app
- ✓ SOA / Microservices, API (management)
- ✓ Containers, Cloud, Virtualization

Benefits

- ✓ Empower IT teams to respond to business requirements quickly, reliably, and predictably
- ✓ Larger enterprises can benefit most, but adoption is lagging behind





“Restrictive” Environment

Due to scale and/or nature of business:

- ⇒ requires governance
- ⇒ limits access and options





Enterprise Requirements

- ✓ Multiple/complex environments
 - on-prem, multi-cloud, hybrid
- ✓ Centralized/unified management and **governance**
 - Provisioning, monitoring, log collection, IdM/AAA, Cost
- ✓ **Integration** with existing, often legacy, components
- ✓ **Security** infrastructure
 - OS, IdM/AAA
- ✓ **Software management**
 - patches, packages, images





Enterprise Challenges & Constraints

- ✓ **Separation** of responsibilities

- Infrastructure, Operations, Security, Legal

- ✓ **Network** access

- white/black-listing, air gap

- ✓ **Security** tools and processes

- infra, OS, platform, apps

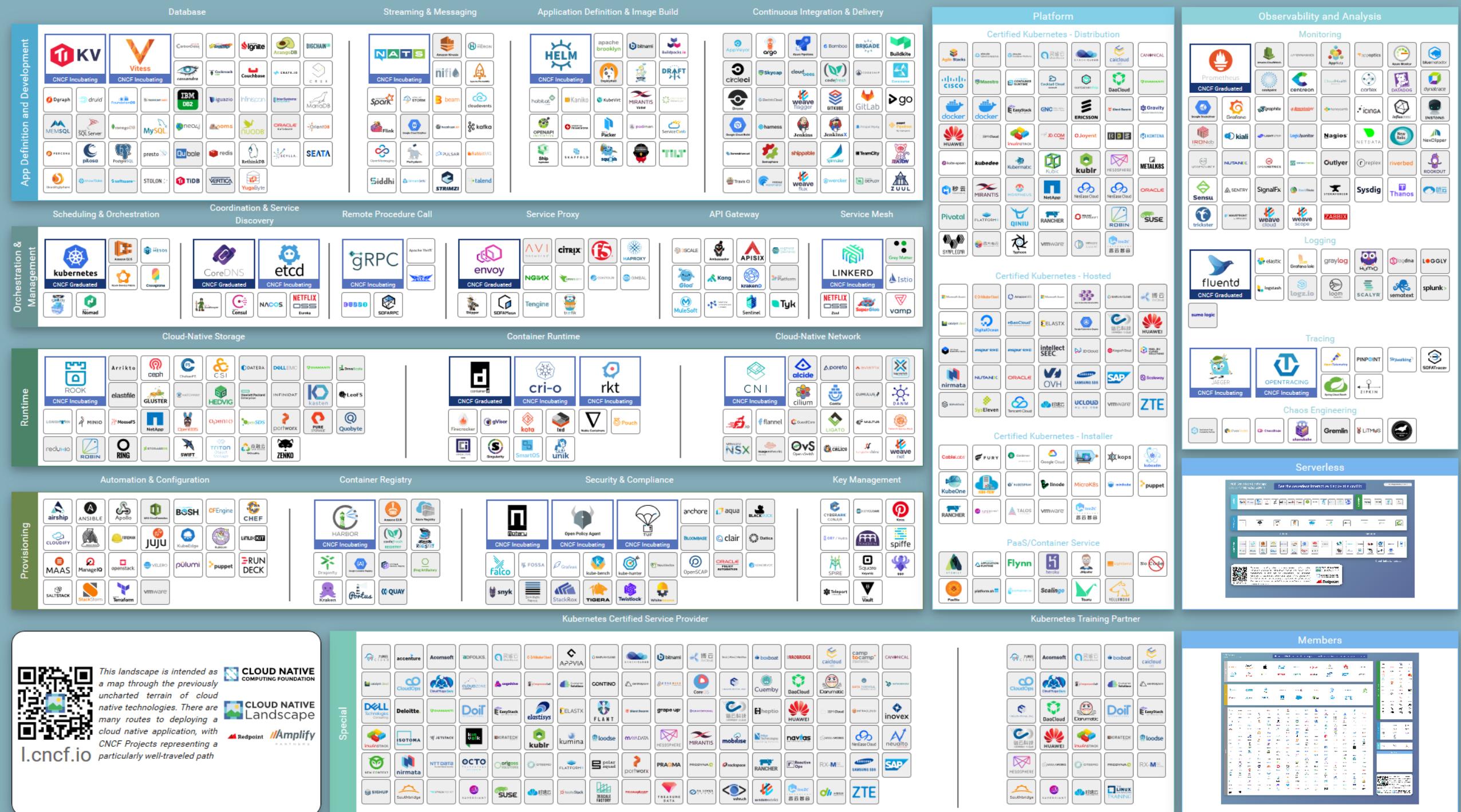
- ✓ OS, platform, and software **practices and standards**

- Vendor and version certification; configuration practices; custom package repositories; etc

- ✓ **Regulations**

- ✓ **Complexity**





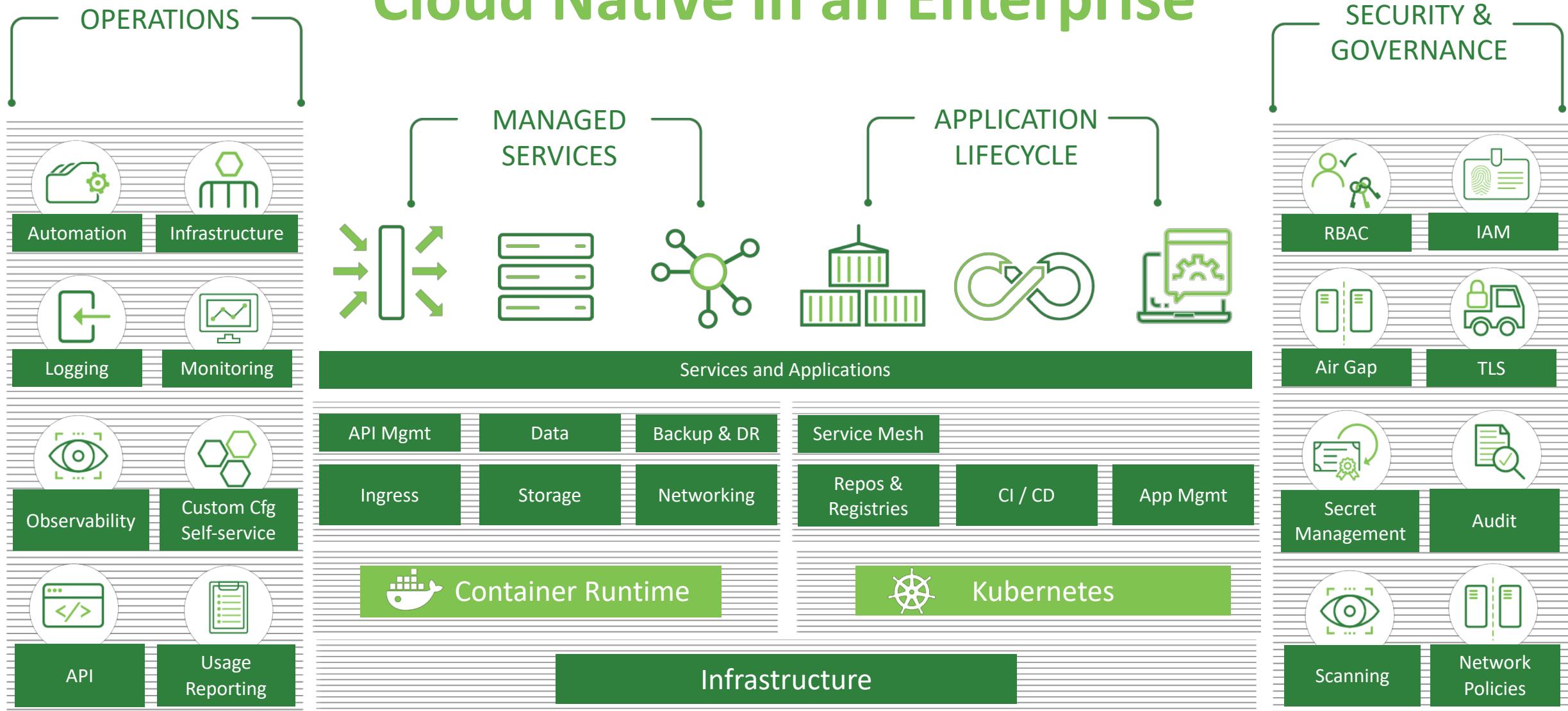


What is Kubernetes?

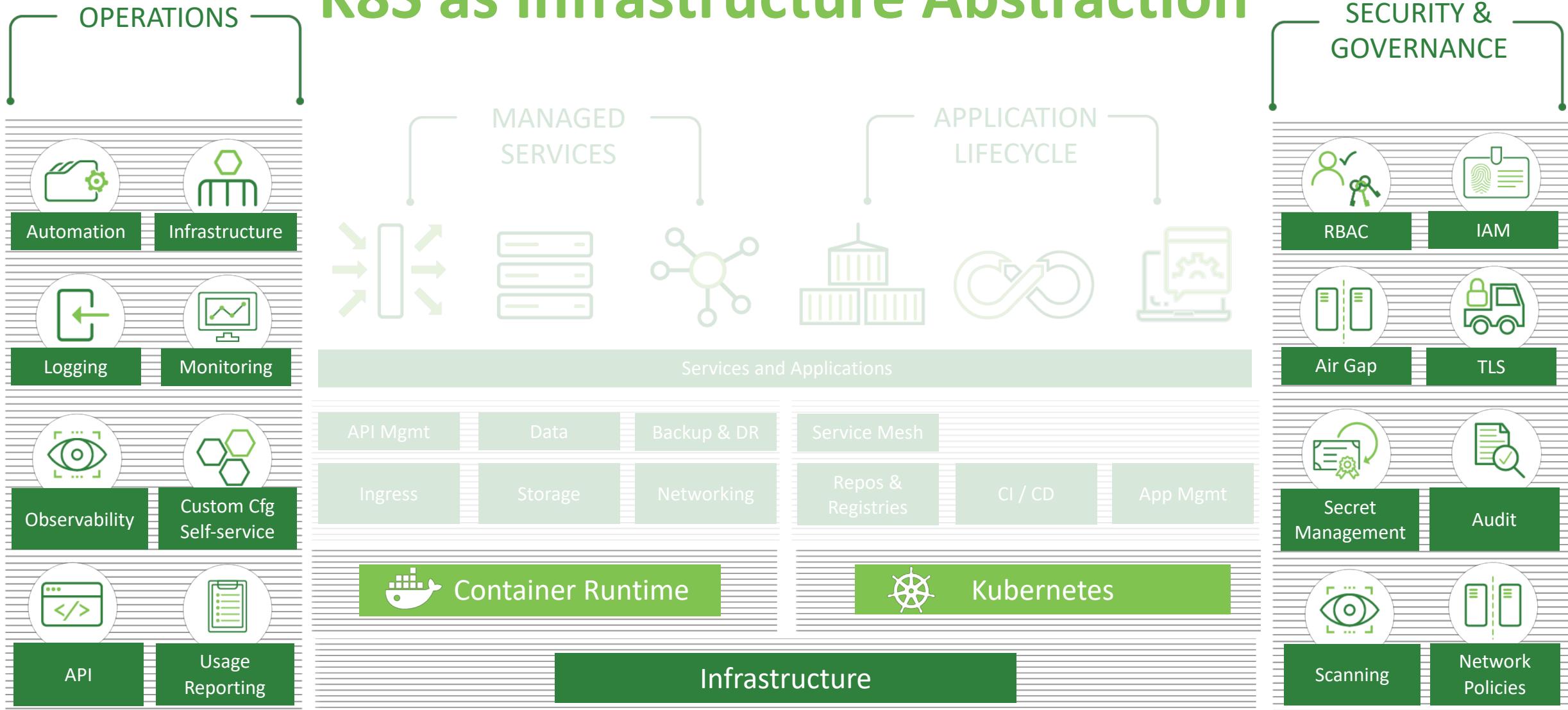
- Container orchestrator?
- A step in the evolution from mainframes to serverless?
- Microservices platform?

✓ Infrastructure/cloud abstraction and platform

Cloud Native in an Enterprise



K8S as Infrastructure Abstraction



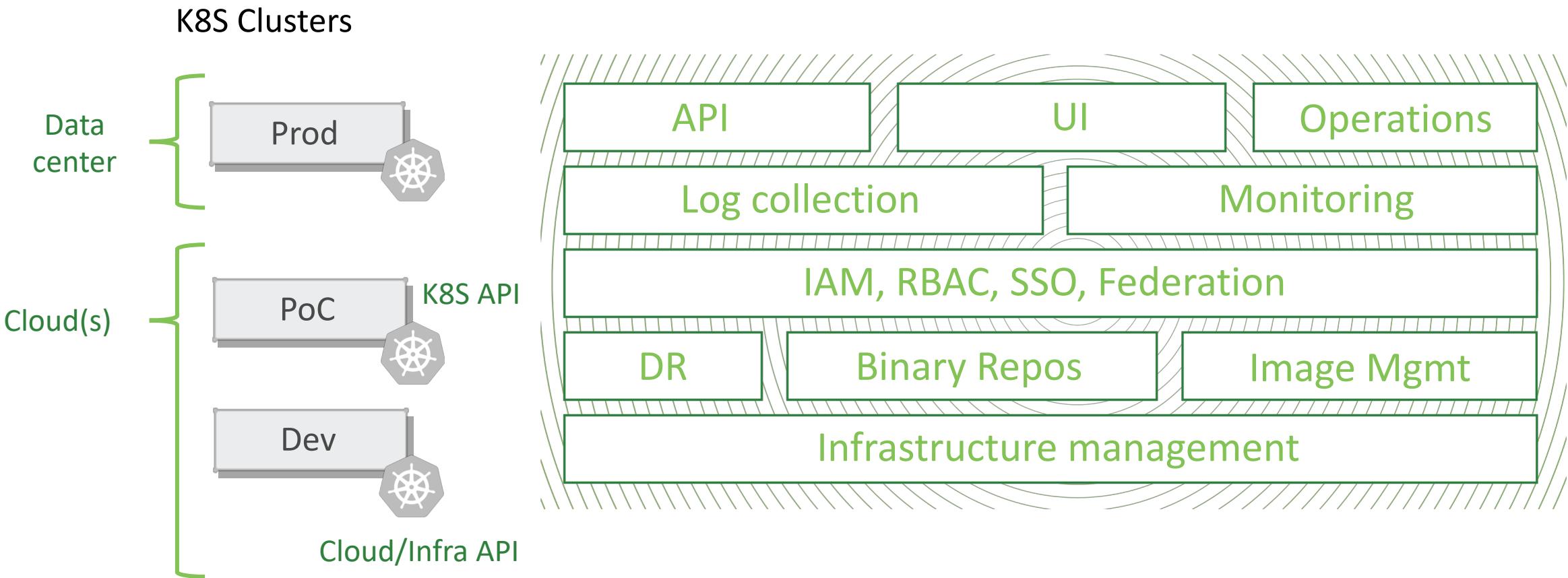


Kubernetes Management Platform

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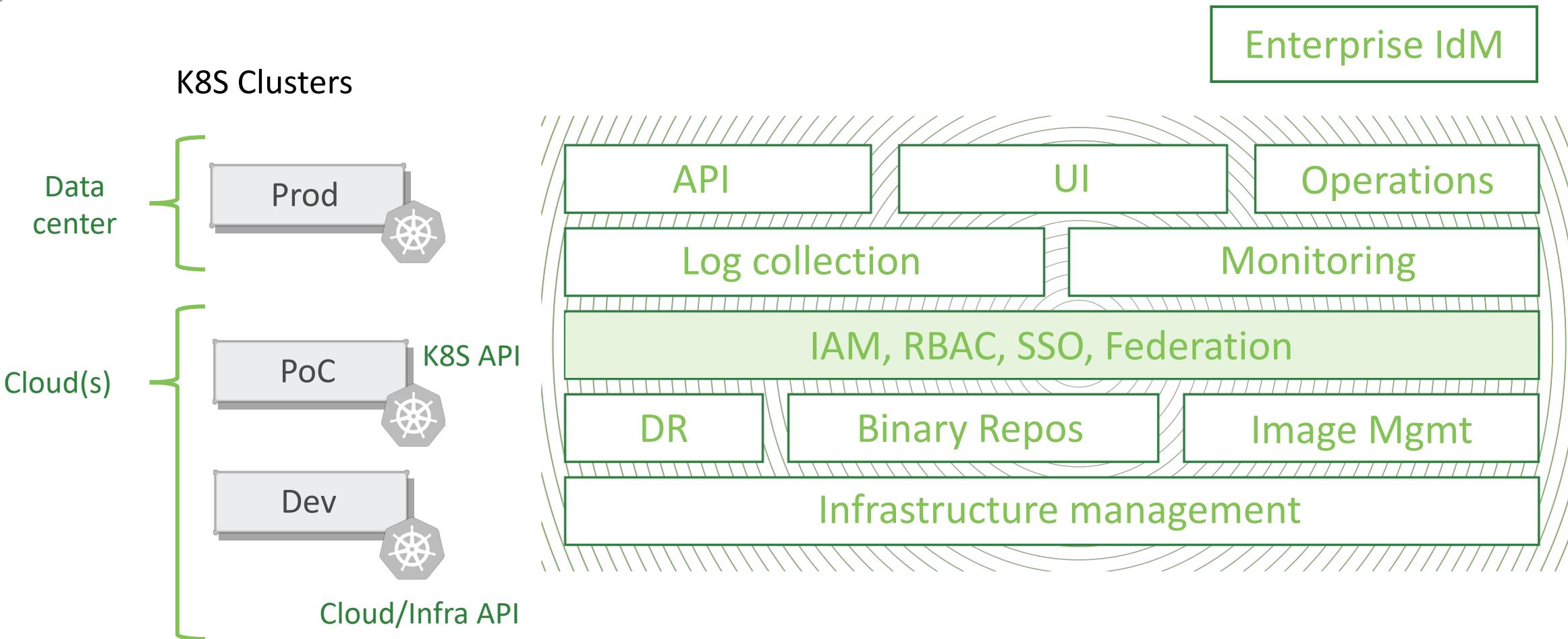


Kubernetes Management



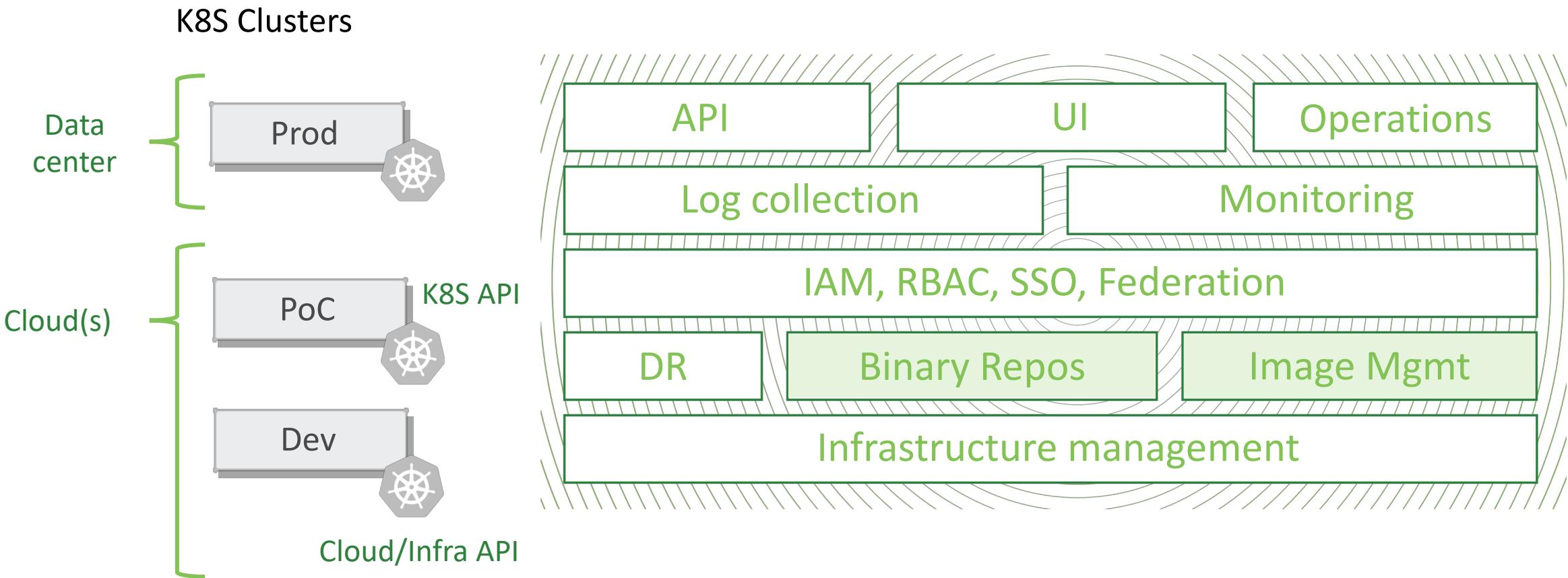


Identity Broker: AAA, SSO, Federation



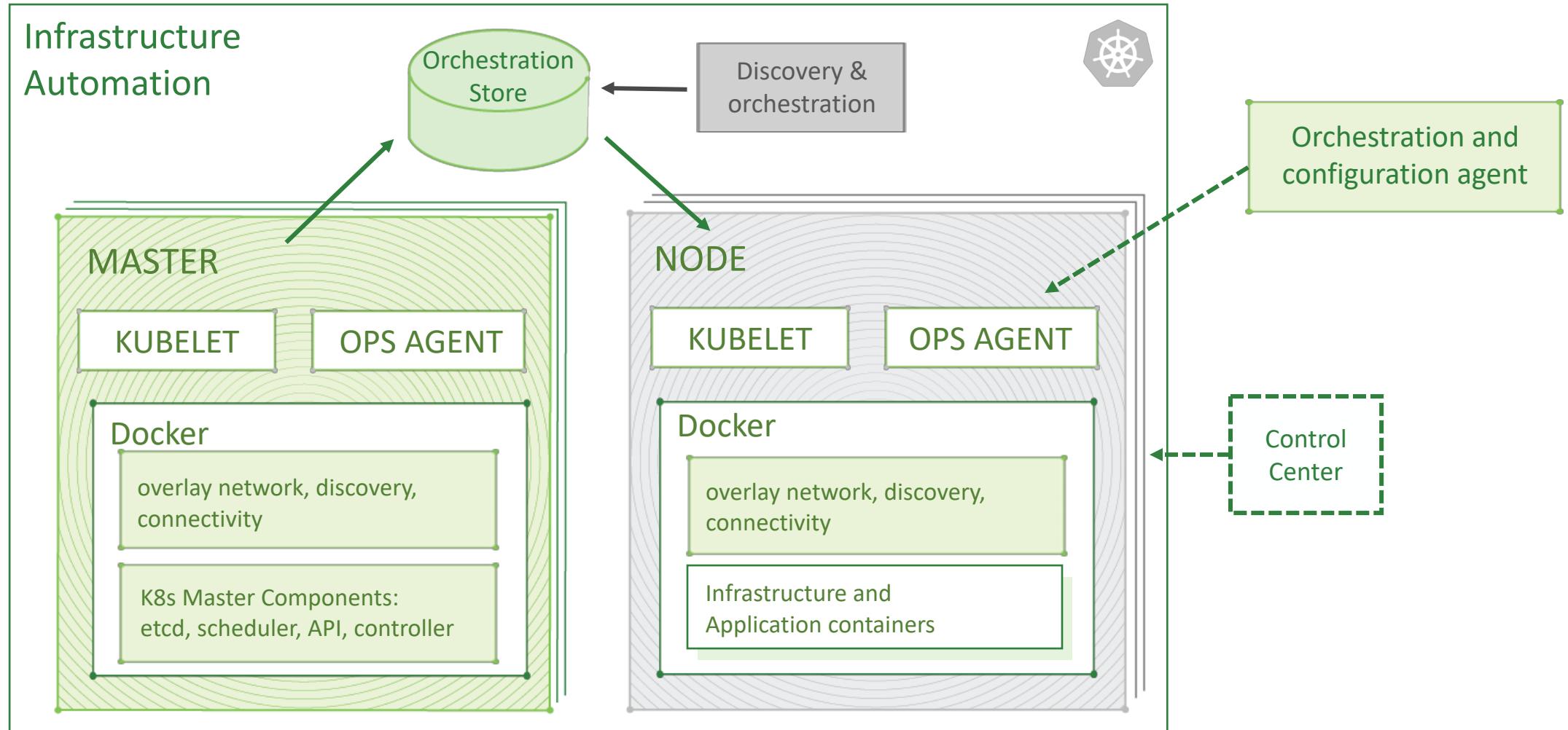


Kubernetes Services





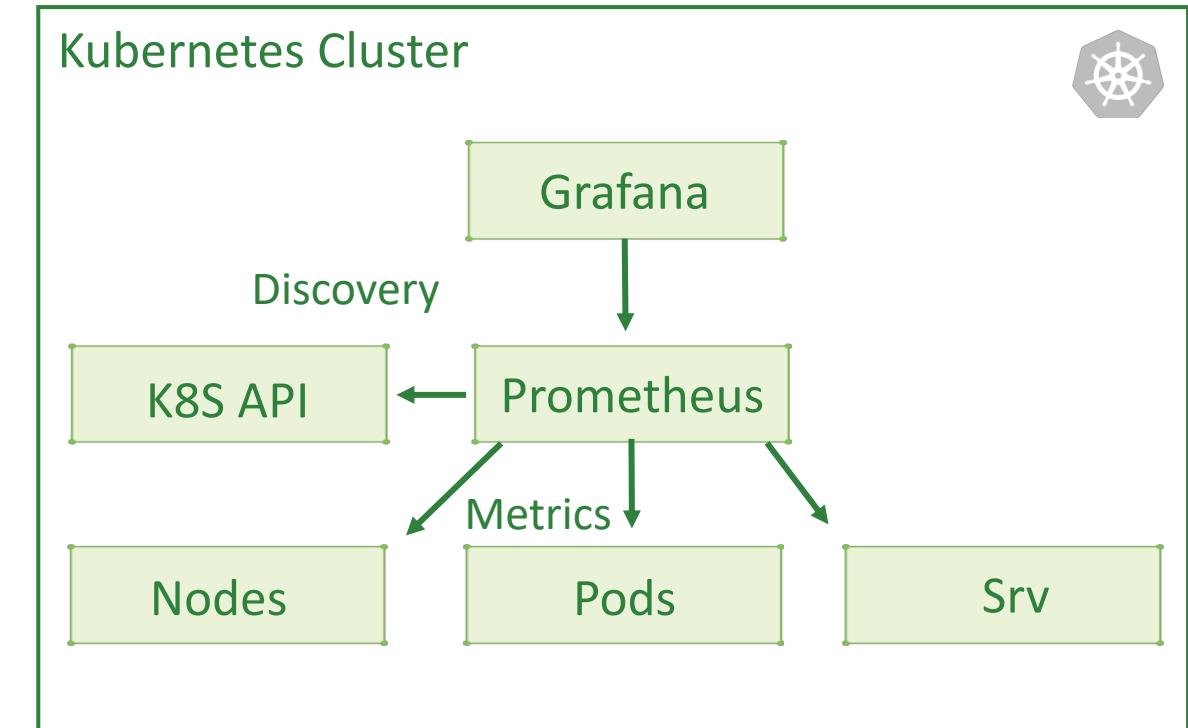
Cluster Architecture





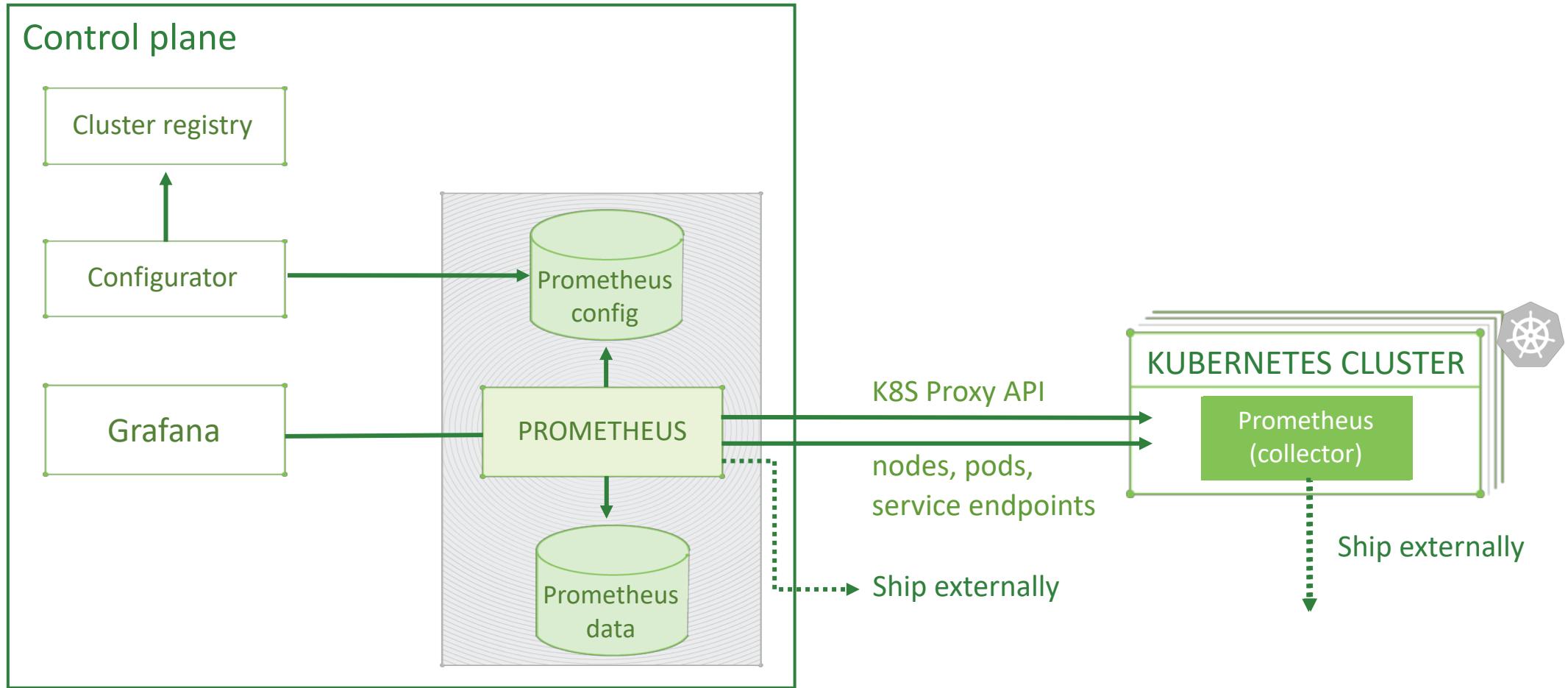
K8S Monitoring with Prometheus

- Discover nodes, services, pods via K8S API
- Query metrics from discovered endpoints
- Endpoint are accessed directly via internal cluster addresses





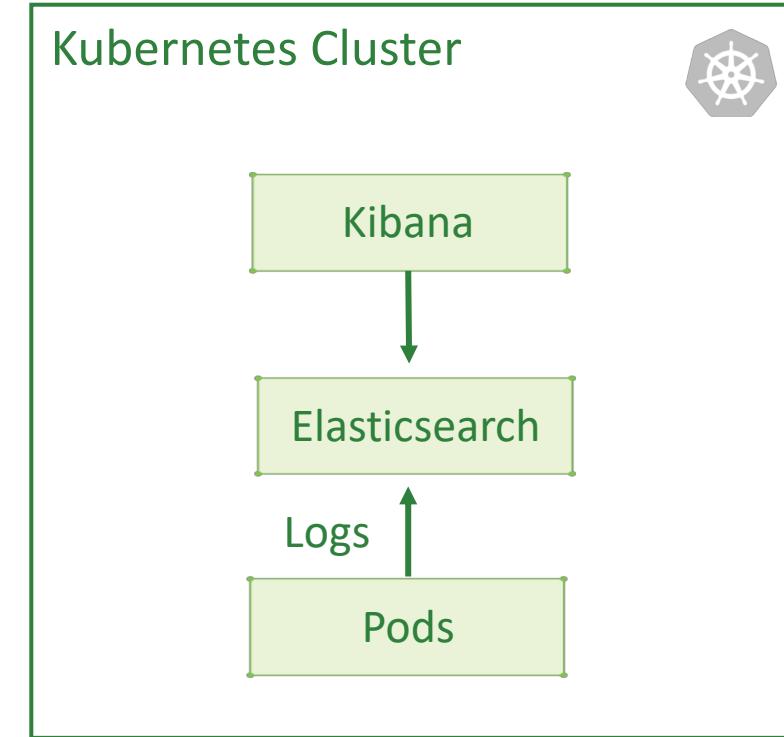
Centralized Monitoring





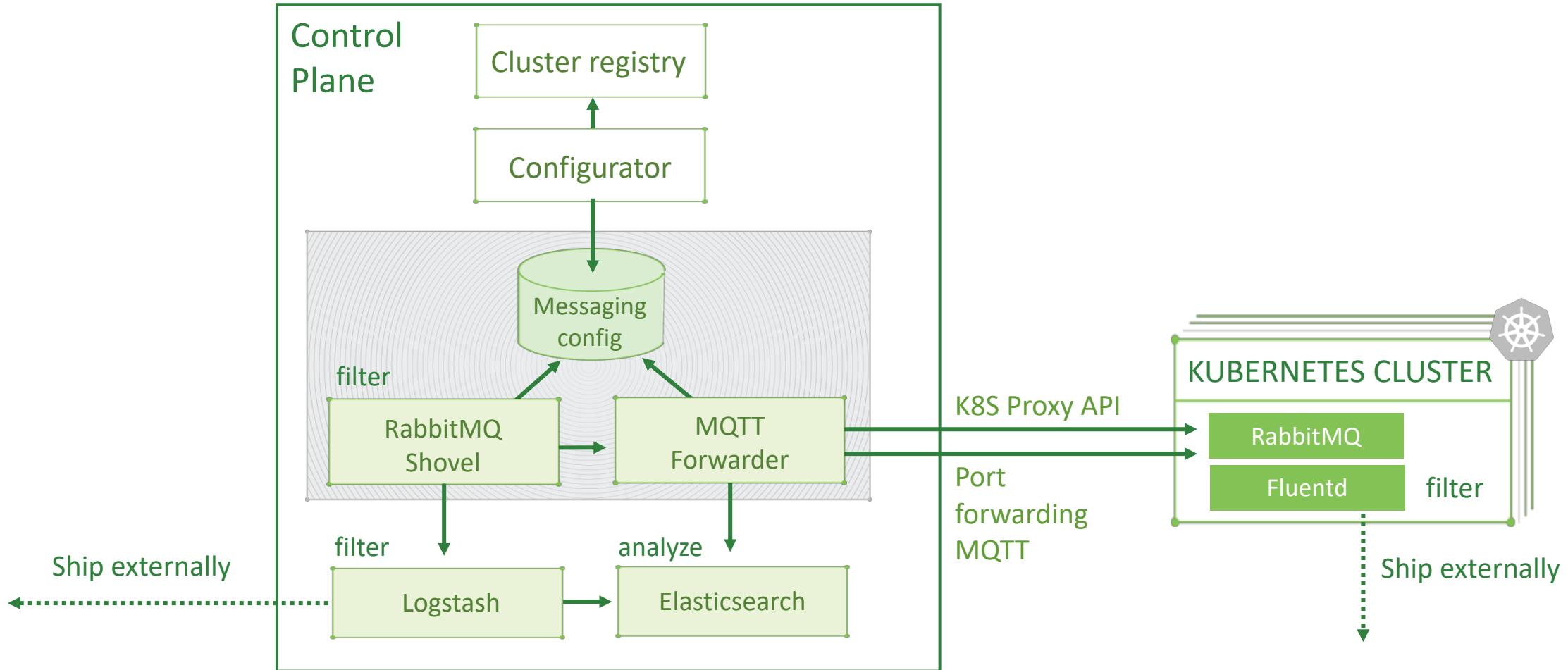
K8S Logging with Elasticsearch

- Fluentd runs on nodes
- OS, K8S, and container logs collected and shipped to Elasticsearch
- Kibana for visualization

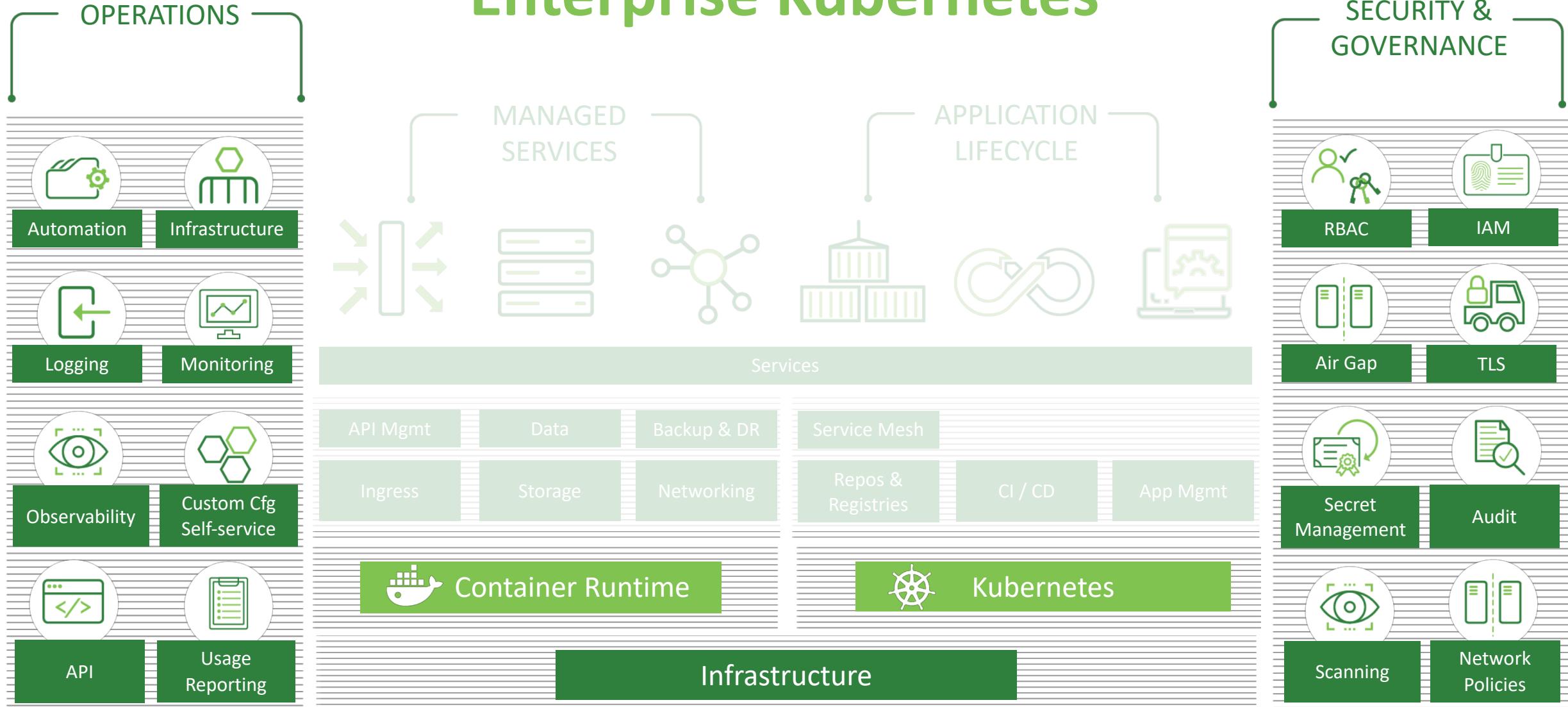




Centralized Log Collection



Enterprise Kubernetes



Q&A

Take Kublr for a test drive!
kublr.com/deploy

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newsletter at kublr.com

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