



**Hewlett Packard
Enterprise**



HPE EZMERAL CONTAINER PLATFORM: CURRENT AND FUTURE

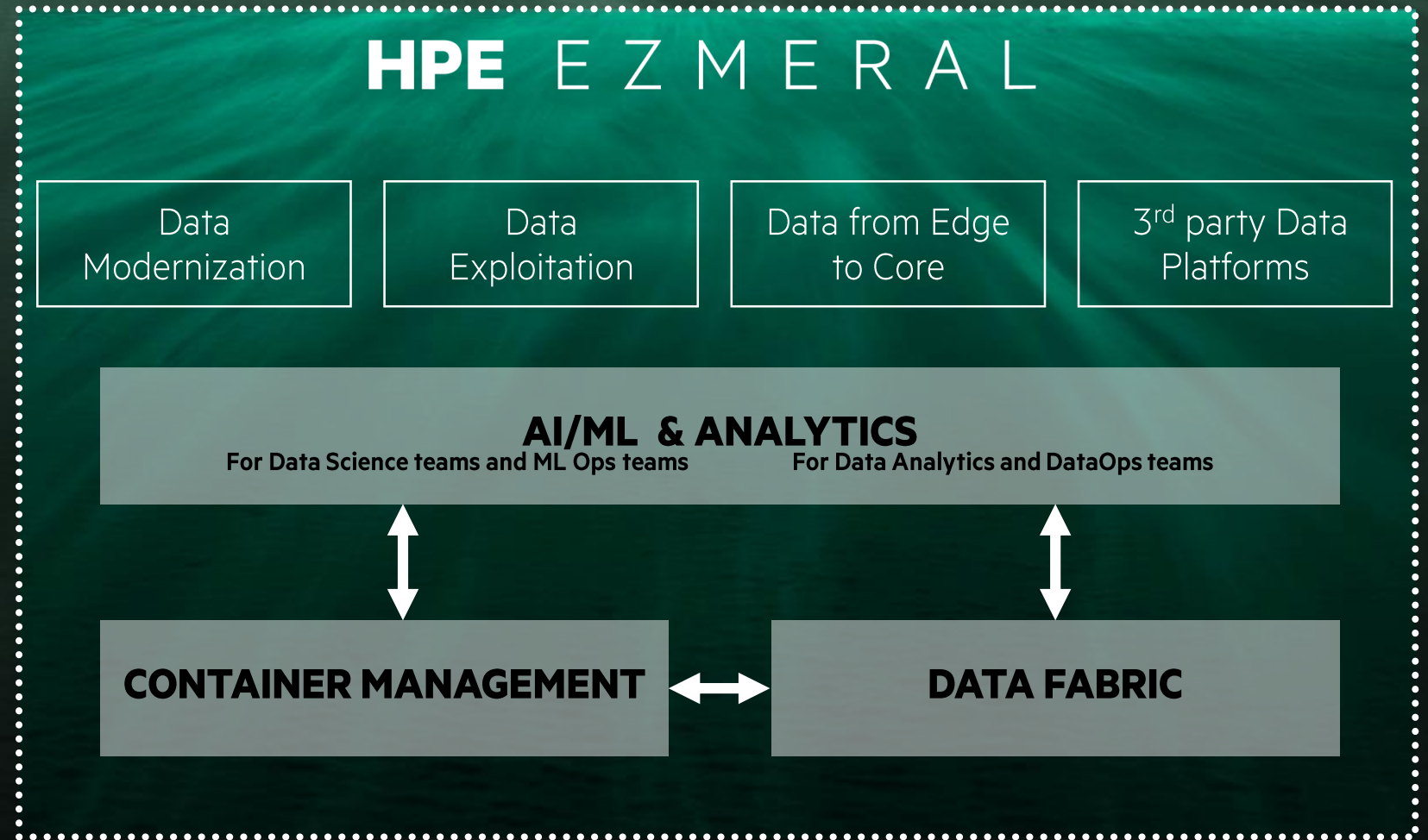
Tom Phelan/CTO Ezmeral
May 2021

AGENDA

- **Ezmeral Container Platform**
 - Overview
 - Current Roadmap
 - Future - High Performance Compute

HPE EZMERAL OVERVIEW

- Products have now been shipping for almost 2 years
- Ezmeral brand launched about 9 months ago and became umbrella name for run-time software
- Bring Technology Together
 - Kubernetes
 - BlueData
 - MapR



HPE EZMERAL: ONE PLATFORM FOR A DIVERSE SET OF WORKLOADS

Non-cloud native applications



Modernize your apps without costly refactoring—and gain efficiency, increase agility and provide application portability



Cloud-native applications



Streamline your development process and accelerate building cloud-native apps and deploying apps with DevOps and CI/CD



Data intensive workloads



HPE Ezmeral Software Platform

Self-service

Pay-per-use¹

Scale up and down

Managed for you

- DevOps
- Microservices
- Containers

- Security enablement
- Multi-tenancy
- Persistent storage for stateful apps



EDGE

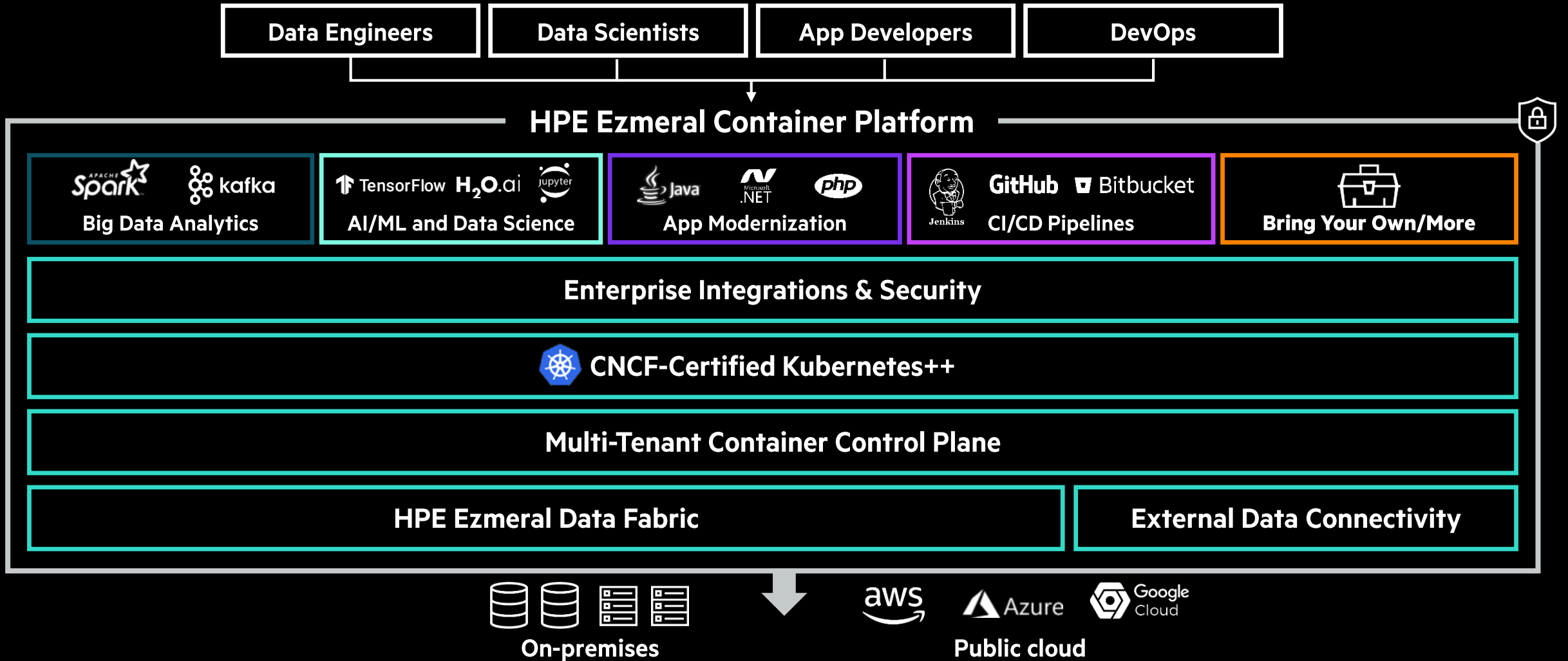


CORE



CLOUD

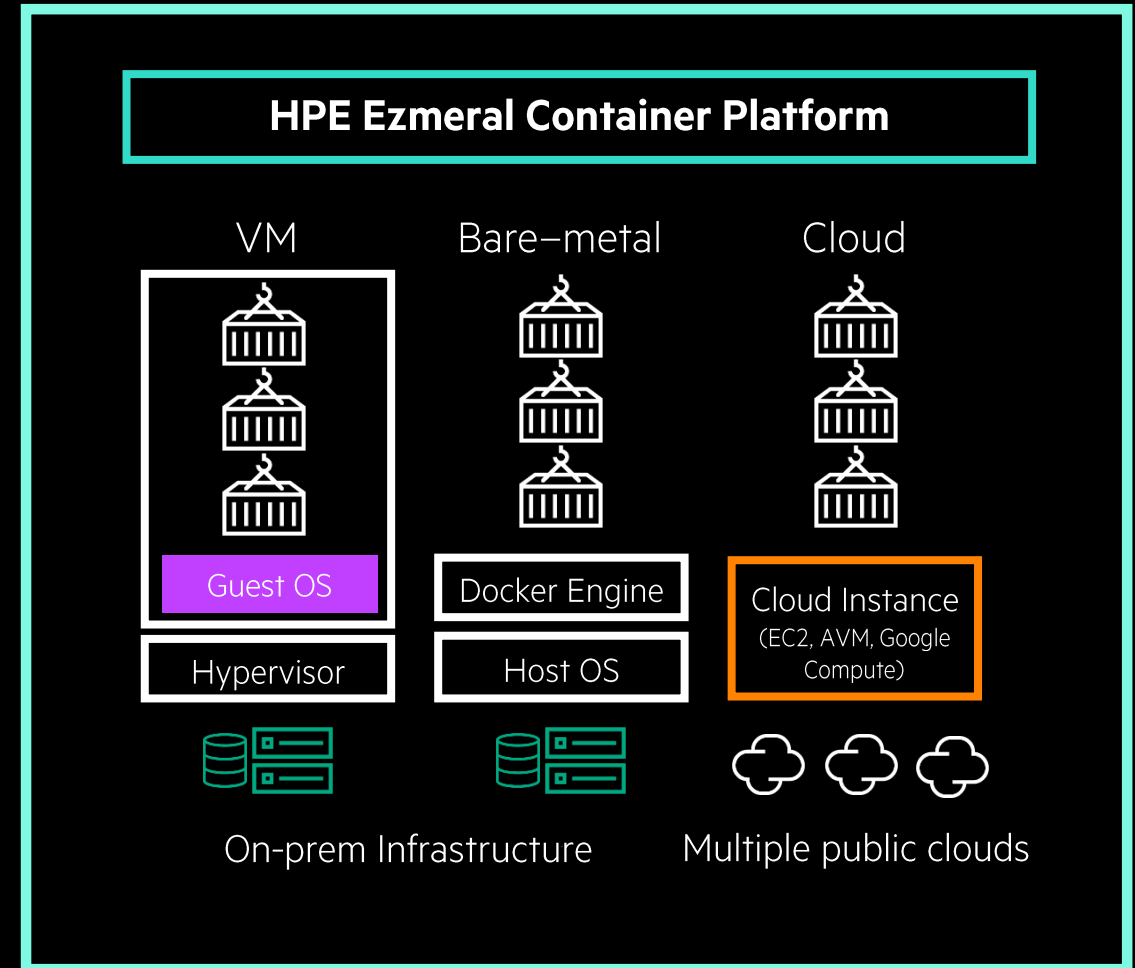
HPE EZMERAL: CONTAINER PLATFORM



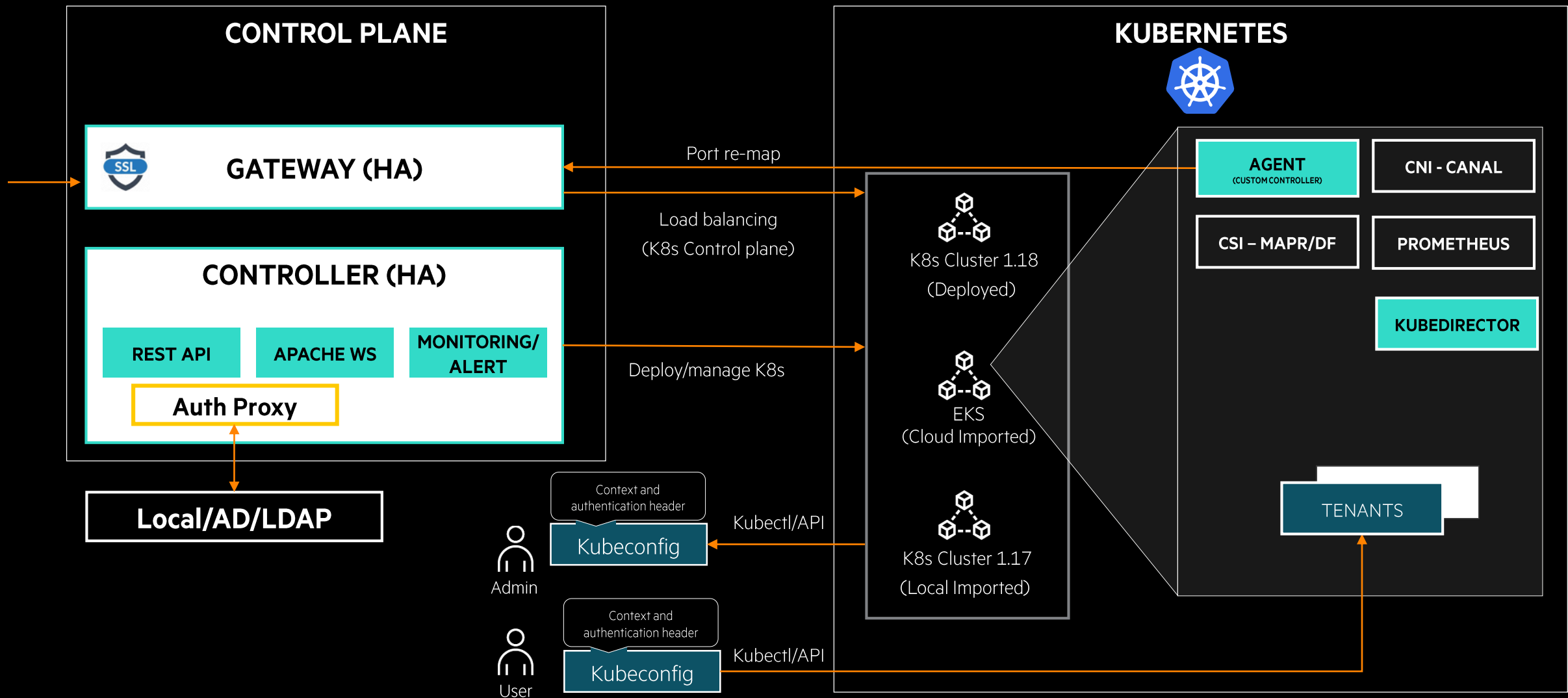
DEPLOY ON MULTIPLE HOST PLATFORMS

Features

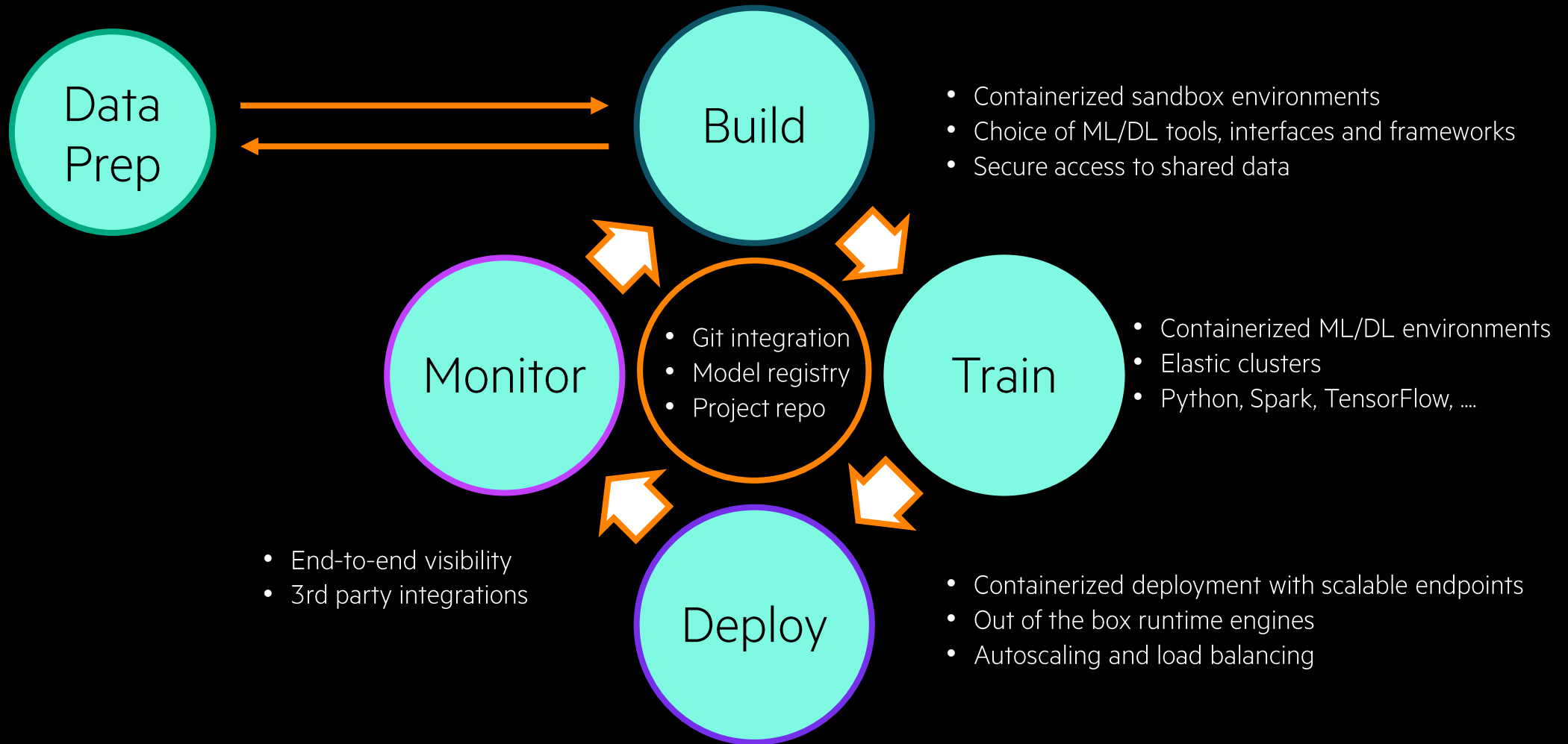
- Edge Core Cloud
- K8s on physical hosts, VMs, and Cloud instances
- Selectively place workloads on different hosts
- Bring your own K8s version
- Secure data and applications across edge, core, and cloud



HPE EZMERAL: CONTROL PLANE



HPE EZMERAL: ML OPS WORKFLOW



HPE EZMERAL: ML OPS

HPE Ezmeral ML Ops

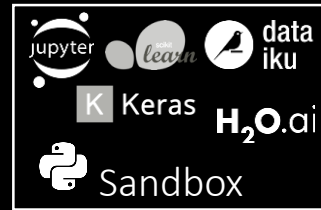


Monitor



Data Processing

Data Prep

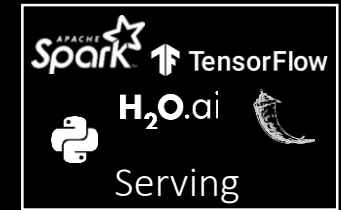


Build



Training

Train



Serving

Deploy

Collaborate

HPE Ezmeral Container Platform

Multi-tenant multi-cluster management for containerized applications — with pre-integrated data fabric and persistent container storage

Compute



CPUs



GPUs



Storage



NFS



HDFS

On-Premises



Public Cloud

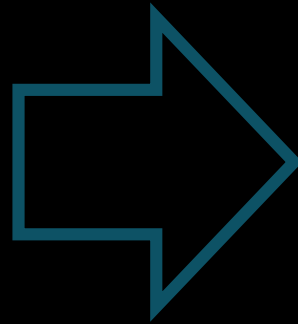
HPE EZMERAL RUN-TIME SOFTWARE & HPE GREENLAKE STRATEGY

HPE Ezmeral Software

Provide a cloud-like experience on-premises

Modern Container Platform with open source K8s and data centric apps

Edge-to-cloud scale-out data fabric for files and objects



HPE GreenLake offers Ezmeral capability as-a-Service

On-premises consumption-based pricing

Managed for you

Self-service experience

Marketplace of apps and solutions



CENTRALIZED POLICY MANAGEMENT

Challenges

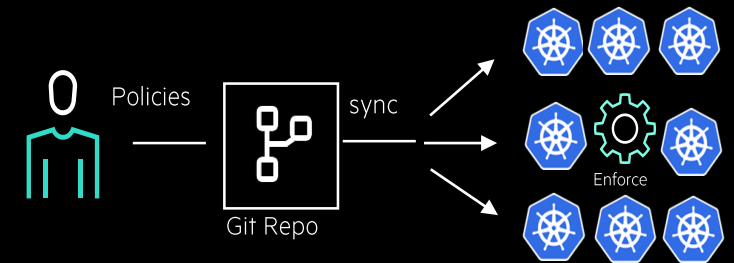
- Maintaining control over sprawling Kubernetes clusters
- Inconsistent or lack of policies pose security threat
- Policy drifts are hard to govern leading to non-compliance
- Manual policy management is tedious and an ops burden

Features

- Git(Ops) integrated Centralized Policy management
- Fine grained policy enforcement via Policy Controller (OPA)
- Drift detection , reconciliation and automatic policy sync

Benefits

- Policy guardrails ensure consistent clusters across hybrid estate
- Continuous policy compliance, control and improved Ops efficiency



CONTAINER RUNTIME SECURITY

Challenges

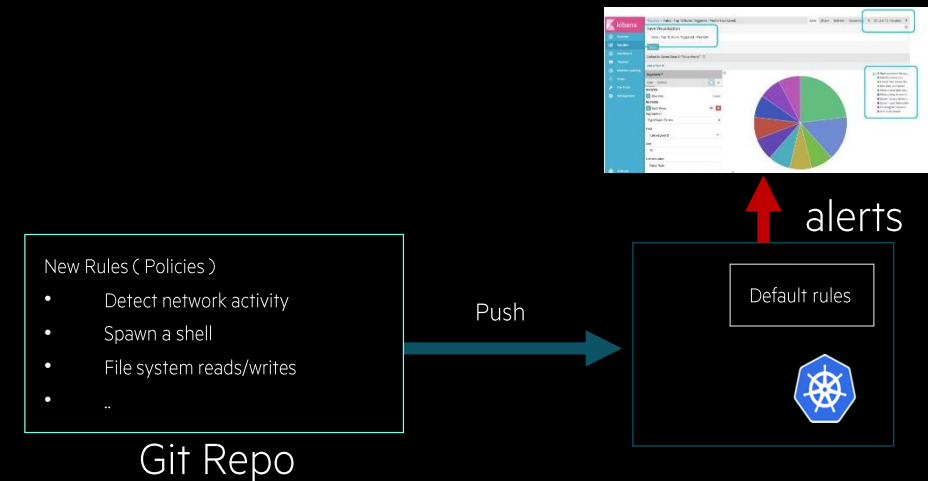
- Vulnerability scanning (Shift Left) is good but not sufficient
- Never ending CVE exploits and malicious intrusions
- Microservices present wider attack surface
- Cannot react to threats if one can't see it

Feature

- Runtime Security enabled by Default
- Automatic sync of new rules via Git
- Visual Alerting of policy violations

Benefits

- Improved container security & threat detection
- Reduced risk with immediate alerting
- Leverage most current detection rules for CVE/malicious exploits



HPE EZMERAL CONTAINER PLATFORM JOURNEY

5.0
(Q1CY20)

Platform Introduction

- Multi-cluster Enterprise grade K8s
- Multi-tenancy
- IAM, RBAC , Security
- Observability
- Data Fabric & Data Tap

5.1
(Q3CY20)

Scalability

- 1000+ Nodes
- Upgrade optimization
- Responsive UI, Metrics
- OS Security - SE Linux

5.2
(Q4CY20)

Hybrid, Multi-cloud & Data management

- Hybrid & Multi-cloud K8s mgmt.
 - EKS, AKS, GKE, PKS, CNCF K8s
- Istio Service Mesh
 - Observability & Visualization
 - Tenant granularity
- Data Fabric on K8s

JUST THE FACTS

Category	Description
OS support	RHEL/CentOS 7.7, 7.8 SLES 15 SP2
Kubernetes Versions	1.18-1.20 (RHEL OS) 1.18.6 (SLES)
Policy Management	Git-integrated , Policy and drift management
Runtime Security	OSS Falco based , Threat detection and alerting
Data Fabric on K8s	Stability improvements; Feature enhancements
Imported Clusters	EKS 1.18, 1.19 GKE 1.18.16-gke-302, 1.18.16-gke-502 AKS 1.18.14, 1.19.7, 1.20.2 PKS 1.7



LOOKING INTO THE FUTURE

*Guidance only; Subject to Change

Near –Mid term (3-9 months)	Long term (9months+)	
<p>Manageability</p> <p>K8s-native management plane Modern Observability stack – Prometheus, Grafana, FluentD Metrics aggregation and Log shipping UX / UI</p>	<p>Manageability 2.0</p> <p>Virtual machine management & Windows Containers Federated Management plane Multi-cluster service mesh (Global & Federated) IT Edge optimization –K8s and Data Fabric</p>	<p>Manageability 3.0</p> <p>Managed K8s Control plane Cloud cluster Lifecycle management Driverless - Autoscaling & Self healing clusters OT Edge , Micro edge</p>
<p>Security</p> <p>End-end Application Authentication (JWT) Platform OIDC authentication Secrets management (Vault) Certificate management & rotation Image security and registry Runtime security – Alert exports (Elastic, Prometheus)</p>	<p>Security (Zero Trust)</p> <p>SPIRE integrated Service Mesh Workload attestation (K8s and non K8s) OIDC Federation Hardware integrated security (SiROT)</p>	<p>Observability</p> <p>Lifecycle management Application performance monitoring (Infosight) Distributed tracing</p>
<p>Data Services</p> <p>Backup and Recovery – K8s control/Data plane Cluster data migration and data mobility Data Fabric Day 2 ops automation</p>	<p>Data Services</p> <p>Edge Optimization Data Fabric on Cloud 1 click automated Disaster Recovery DR to Cloud , Bursting</p>	<p>Data Services</p> <p>Edge to Core to Cloud data mobility</p>
<p>OS and Runtime</p> <p>RHEL 8, SLES 15 SPx Containerd, CRI-O</p>		

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Cloud-native applications

Data intensive workloads



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Cloud-native applications

Data intensive workloads

HPC workloads



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- Singularity Containers
- SLURM Scheduler



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CLOUD

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hpe.com/containerplatform