OpenShift for Data Center

Customer reference

Jakub Veverka

Senior Solution Architect

Agenda

- Customer and Business Drivers
- Solution & Technology
- Adoption Journey

Red Hat

The Customer

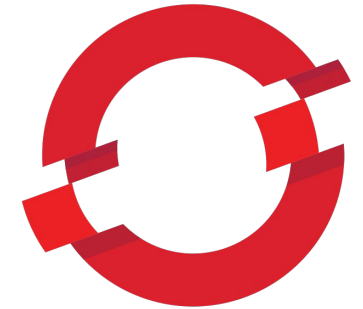# The Customer in Numbers

56,9 Million   Users

423 Million   Monthly Visits

11,3 Billion   Monthly Page Views

5   Top 5 Site Globally

100 %

OPENSHIFT

Red Hat

Business Challenges & Drivers

Enhance and Modernize the underlying technology stack

Establish more secure and well-governed hybrid infrastructure

Minimize manual operational work

Improving scalability and reusability

Improving productivity and velocity

>

Reduced Time-To-Market
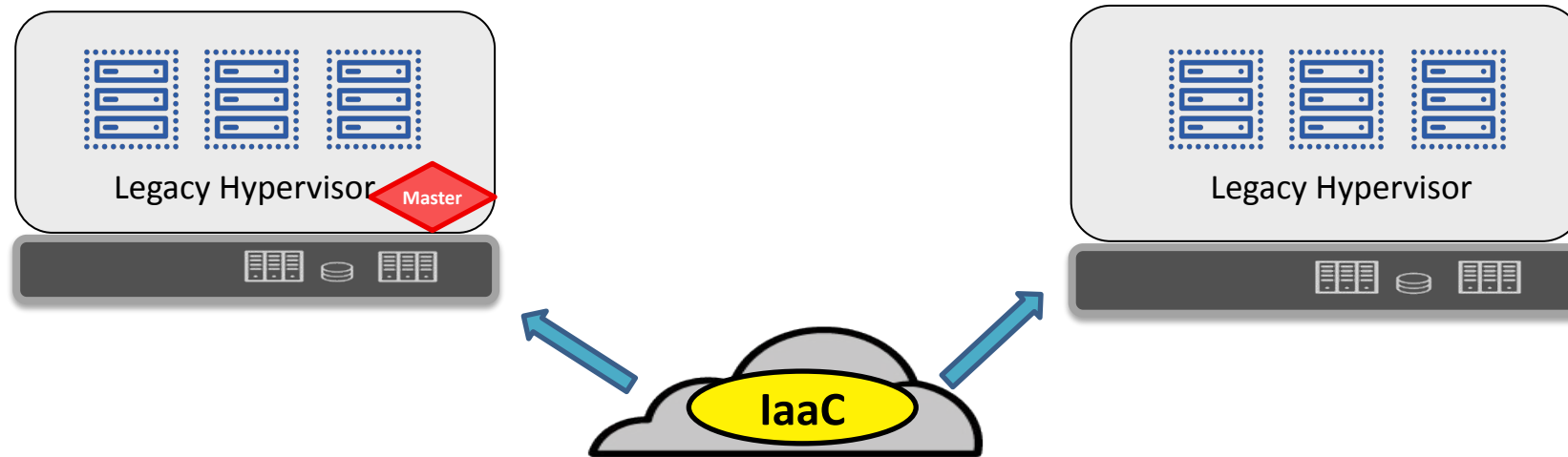
Improved Return of Investment

Improved Operational Efficiency

Attracting and Retaining the Talent

Pre OpenShift Environment

- ☐ 2000+ Virtual Machines
- ☐ Widely using open source Technologies
- ☐ *in-house automation and Infrasturce-As-A-Code platform*
- ☐ *In-house developed CI/CD pipelines*

Hybrid Cloud Strategy

Private Cloud

İstanbul (Active)

IaaC

Private Cloud

Ankara (Active)

Any location (Active)
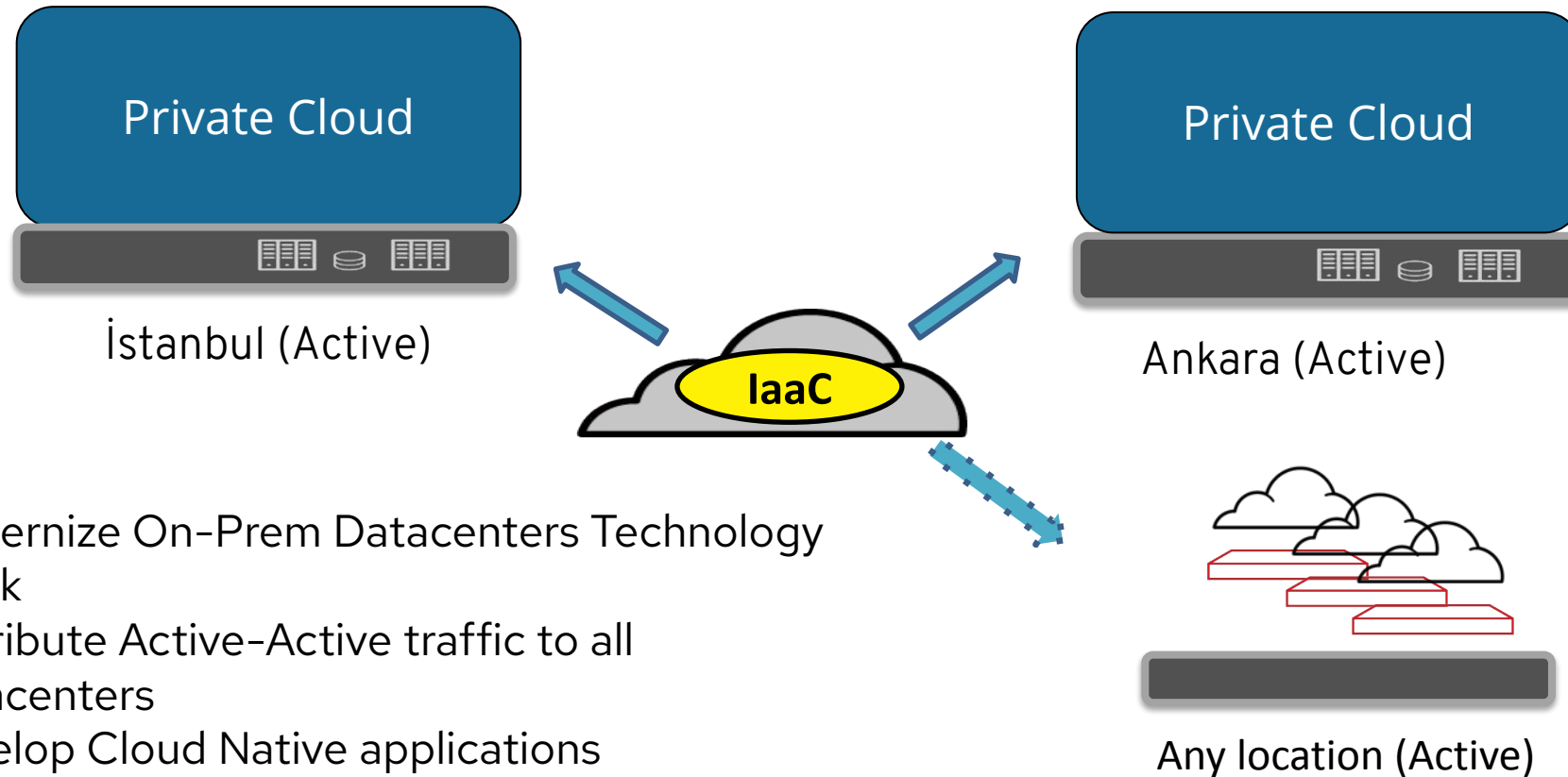
- ☐ Modernize On-Prem Datacenters Technology Stack
- ☐ Distribute Active-Active traffic to all Datacenters
- ☐ Develop Cloud Native applications
- ☐ Enhance CI/CD pipelines

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Customer Requirements
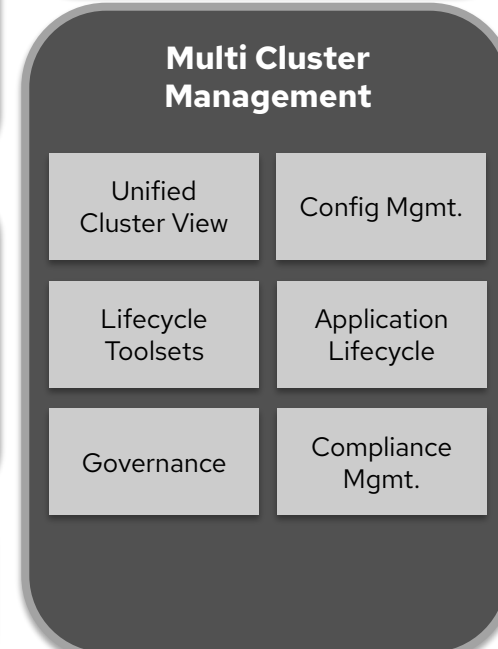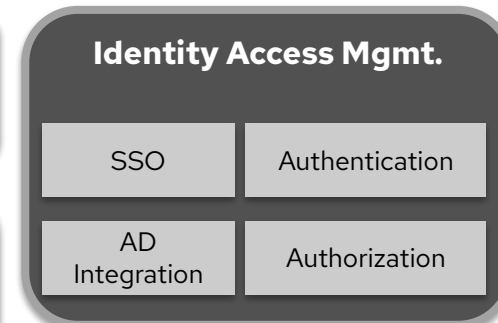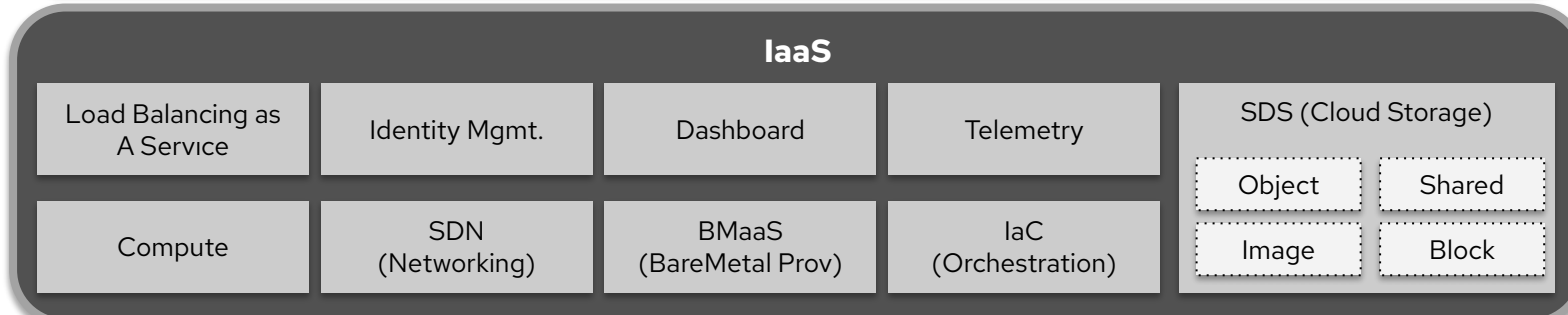
Introduce

App Services & Middleware

Relational Database	Object/NoSQL Database	AI/ML	Big Data	Messaging & Streaming	API GW

PaaS

Admin-Developer Console	Developer Services	Logging	CI/CD Tools	Serverless
Container Orchestration	Container Registry	Automated Operations	Monitoring & Alarms	Service Mesh

IaaS

Load Balancing as A Service	Identity Mgmt.	Dashboard	Telemetry	SDS (Cloud Storage)	
				Object	Shared
Compute	SDN (Networking)	BMaaS (BareMetal Prov)	IaC (Orchestration)	Image	Block

Physical Infrastructure

Server	Network Infrastructure	Physical Storage

Identity Access Mgmt.

SSO	Authentication
AD Integration	Authorization

Multi Cluster Management

Unified Cluster View	Config Mgmt.
Lifecycle Toolsets	Application Lifecycle
Governance	Compliance Mgmt.

Enable

Installation & Integration	Technical Enablement	Managed Services

Red Hat

The Solution

Initial Options

Alternative 1

Alternative 2

As-Is Environment

Strategic hybrid cloud

OpenShift For the Win

Introduce

Enable

App Services & Middleware

| Relational Database | Object/NoSQL Database | AI/ML | Big Data | Messaging & Streaming | API GW |

Red Hat
OpenShift Container Platform

PaaS

| Admin-Developer Console | Developer Services | Logging | CI/CD Tools | Serverless |
| Container Orchestration | Container Registry | Automated Operations | Monitoring & Alarms | Service Mesh |

IaaS

| Load Balancing as A Service | Identity Mgmt | Dashboard | Monitoring | |
| Compute | SDN (Networking) | BMaaS (BareMetal Prov) | IaC (Orchestration) | |

Red Hat
OpenShift Container Platform

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OpenShift Container Storage

Identity Access Mgmt.

| SSO | | Authentication |
| AD Integration | | Authorization |

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SSO

Multi Cluster Management

Unified Cluster View	Config Mgmt.
Lifecycle Tools	Application Lifecycle
Governance	Compliance Mgmt.

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Advanced Cluster Management
for Kubernetes

Physical Infrastructure

| Server | Network Infrastructure | Physical Storage |

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Consulting

Automation & Integration

Red Hat
Training and Certification

Technical Account Management

Managed Services
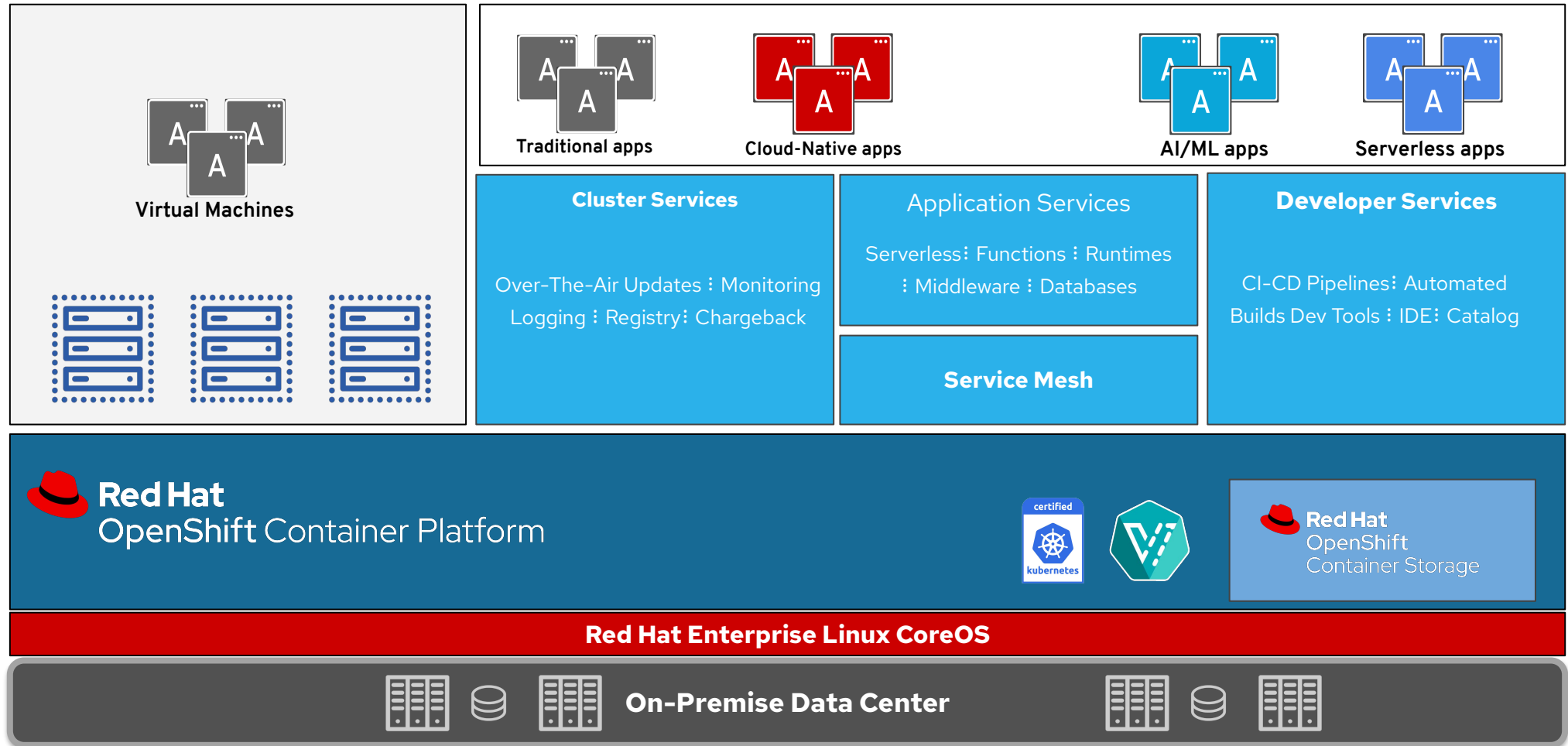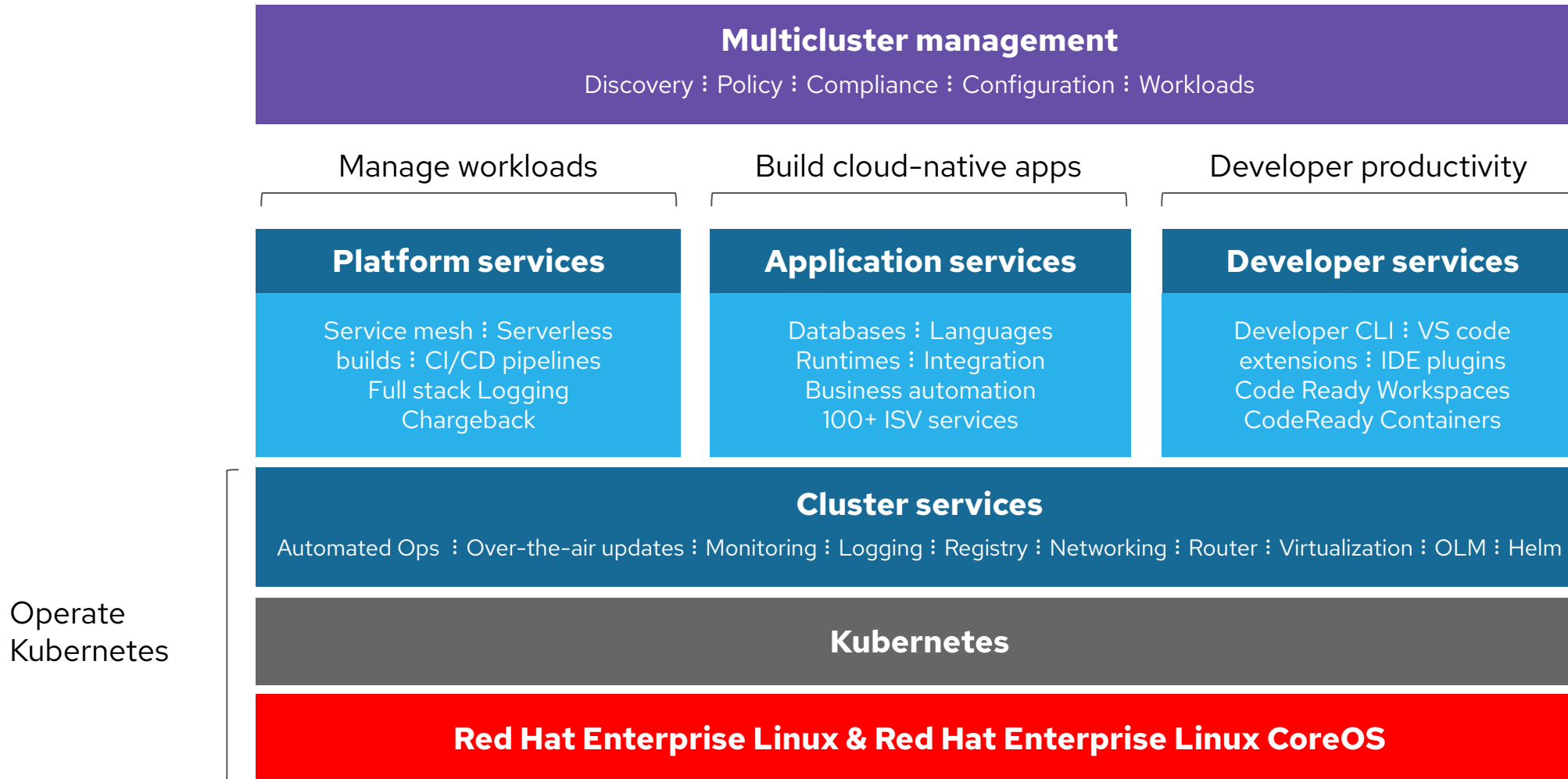
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Why OpenShift?

- Employee Retention
- Ensure Constant Secure Platform
- Ensure Business continuity
- Developer Tools
- Leading Kubernetes Platform Vendor

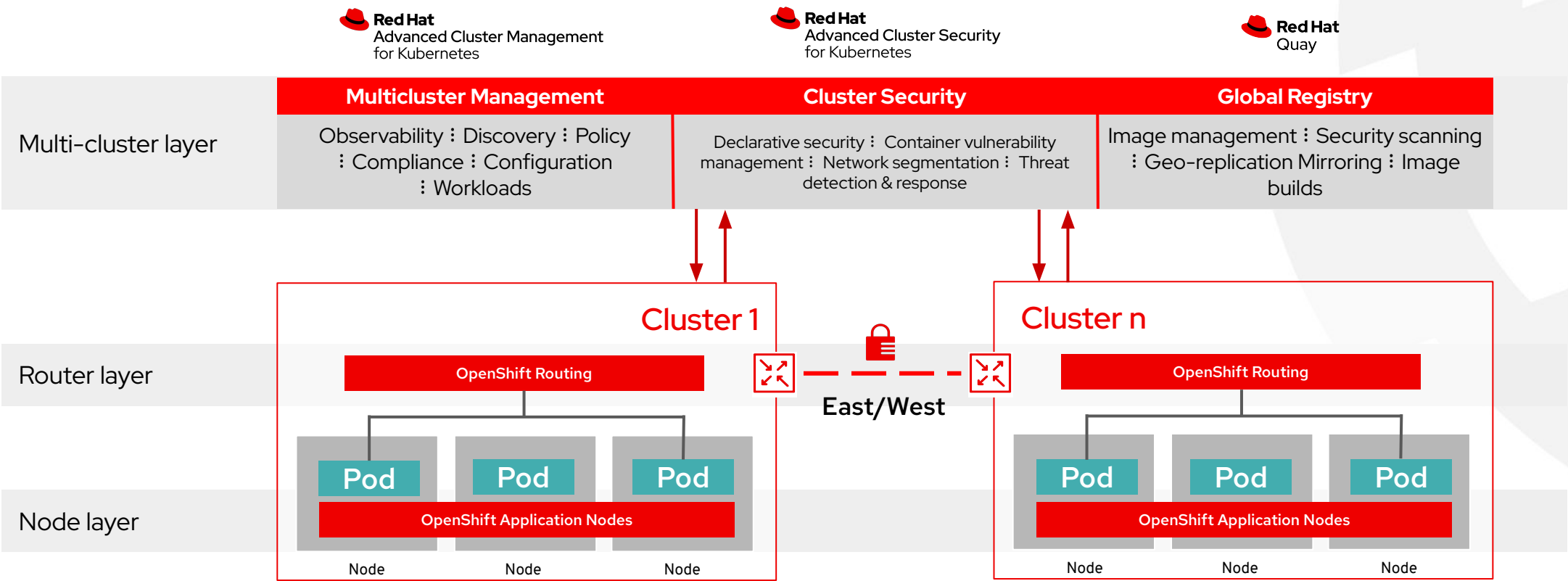Red Hat

Proposed Solution Architecture

Virtual Machines

Traditional apps

Cloud-Native apps

AI/ML apps

Serverless apps

Cluster Services

Over-The-Air Updates : Monitoring Logging : Registry : Chargeback

Application Services

Serverless : Functions : Runtimes : Middleware : Databases

Service Mesh

Developer Services

CI-CD Pipelines : Automated Builds Dev Tools : IDE : Catalog

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OpenShift Container Platform

certified
kubernetes

Red Hat
OpenShift
Container Storage

Red Hat Enterprise Linux CoreOS

On-Premise Data Center

Red Hat

OpenShift Container Platform with OpenShift Virtualization

Multicluster management
Discovery ⋮ Policy ⋮ Compliance ⋮ Configuration ⋮ Workloads

Manage workloads | Build cloud-native apps | Developer productivity

Platform services
Service mesh ⋮ Serverless builds ⋮ CI/CD pipelines Full stack Logging Chargeback

Application services
Databases ⋮ Languages Runtimes ⋮ Integration Business automation 100+ ISV services

Developer services
Developer CLI ⋮ VS code extensions ⋮ IDE plugins Code Ready Workspaces CodeReady Containers

Operate Kubernetes

Cluster services
Automated Ops ⋮ Over-the-air updates ⋮ Monitoring ⋮ Logging ⋮ Registry ⋮ Networking ⋮ Router ⋮ Virtualization ⋮ OLM ⋮ Helm

Kubernetes

Red Hat Enterprise Linux & Red Hat Enterprise Linux CoreOS

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Red Hat OpenShift Platform Plus

Enabling hybrid and multi-cloud deployments

Red Hat
Advanced Cluster Management
for Kubernetes

Red Hat
Advanced Cluster Security
for Kubernetes

Red Hat
Quay

Multicluster Management	Cluster Security	Global Registry
Observability ⦂ Discovery ⦂ Policy ⦂ Compliance ⦂ Configuration ⦂ Workloads	Declarative security ⦂ Container vulnerability management ⦂ Network segmentation ⦂ Threat detection & response	Image management ⦂ Security scanning ⦂ Geo-replication Mirroring ⦂ Image builds

Multi-cluster layer

Cluster 1

Router layer

OpenShift Routing

East/West

Pod   Pod   Pod

Node layer

OpenShift Application Nodes

Node   Node   Node

Cluster n

OpenShift Routing

Pod   Pod   Pod

OpenShift Application Nodes

Node   Node   Node

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OpenShift

Red Hat Advanced Cluster Security for Kubernetes

A cloud workload protection platform and cloud security posture management to enable you to "shift left"

Shift left	Cloud security posture management (CSPM)	Cloud workload protection (CWPP)
Secure supply chain	Secure infrastructure	Secure workloads
Extend scanning and compliance into development (DevSecOps)	Leverage built-in Kubernetes CSPM to identify and remediate risky configurations	Maintain and enforce a "zero-trust execution" approach to workload protection

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Red Hat delivers continuous security for containers and Kubernetes

Control

| Trusted content |
| Container registry |
| Build management |
| CI/CD pipeline |

Protect

| Kubernetes platform lifecycle |
| Identity and access management |
| Platform data |
| Deployment policies |

Detect & Respond

| Container isolation |
| Network isolation |
| Application access and data |
| Observability |

Build — **Deploy** — **Run**

DevSecOps

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A layered approach to container and Kubernetes security

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Control

Protect

Detect & Respond

Control	Protect	Detect & Respond
Trusted content	Kubernetes platform lifecycle	Container isolation
Container registry	Identity and access management	Network isolation
Build management	Platform data	Application access and data
CI/CD pipeline	Deployment policies	Observability
Vulnerability analysis	Image assurance and policy admission controller	Runtime behavioral analysis
App config analysis	Compliance assessments	Auto-suggest network policies
APIs for CI/CD integrations	Risk profiling	Threat detection / incident response

DevSecOps

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Red Hat Data Foundation

Applications

Red Hat Data Foundation 〉

Kubernetes ReadWriteOnce (RWO) and ReadWriteMany (RWX) storage classes
Kubernetes object storage service
Multicloud object gateway

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OpenShift
Container Platform

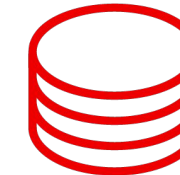AWS/Azure/GCP | VMware | Bare metal
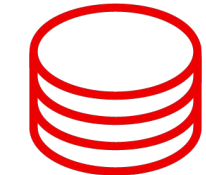
Storage 〉
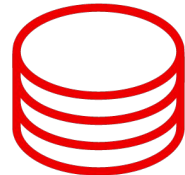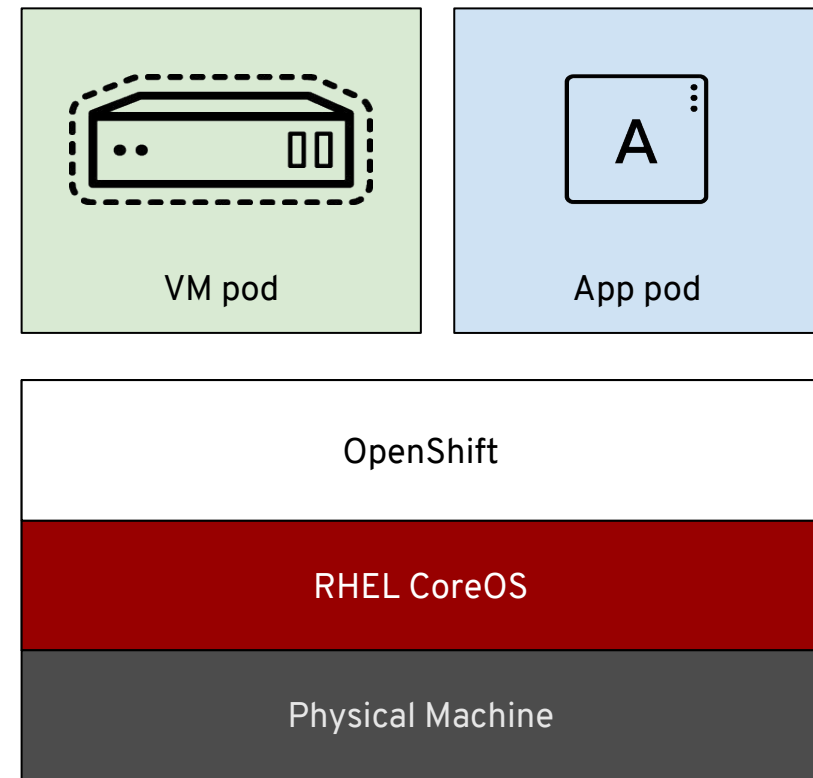
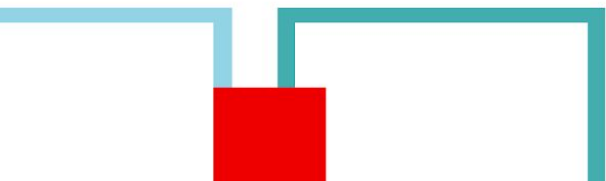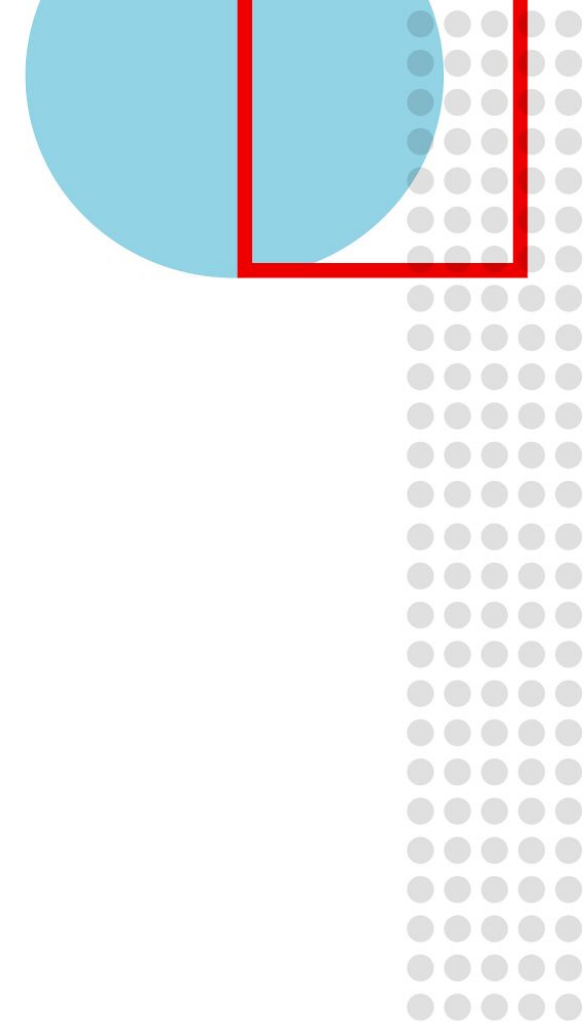Instance store volume | Cloud storage | SAN | vSAN | Local drives
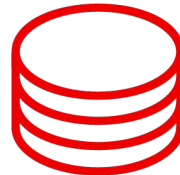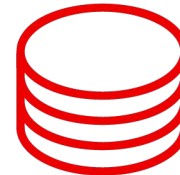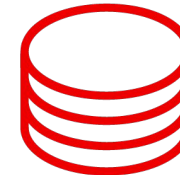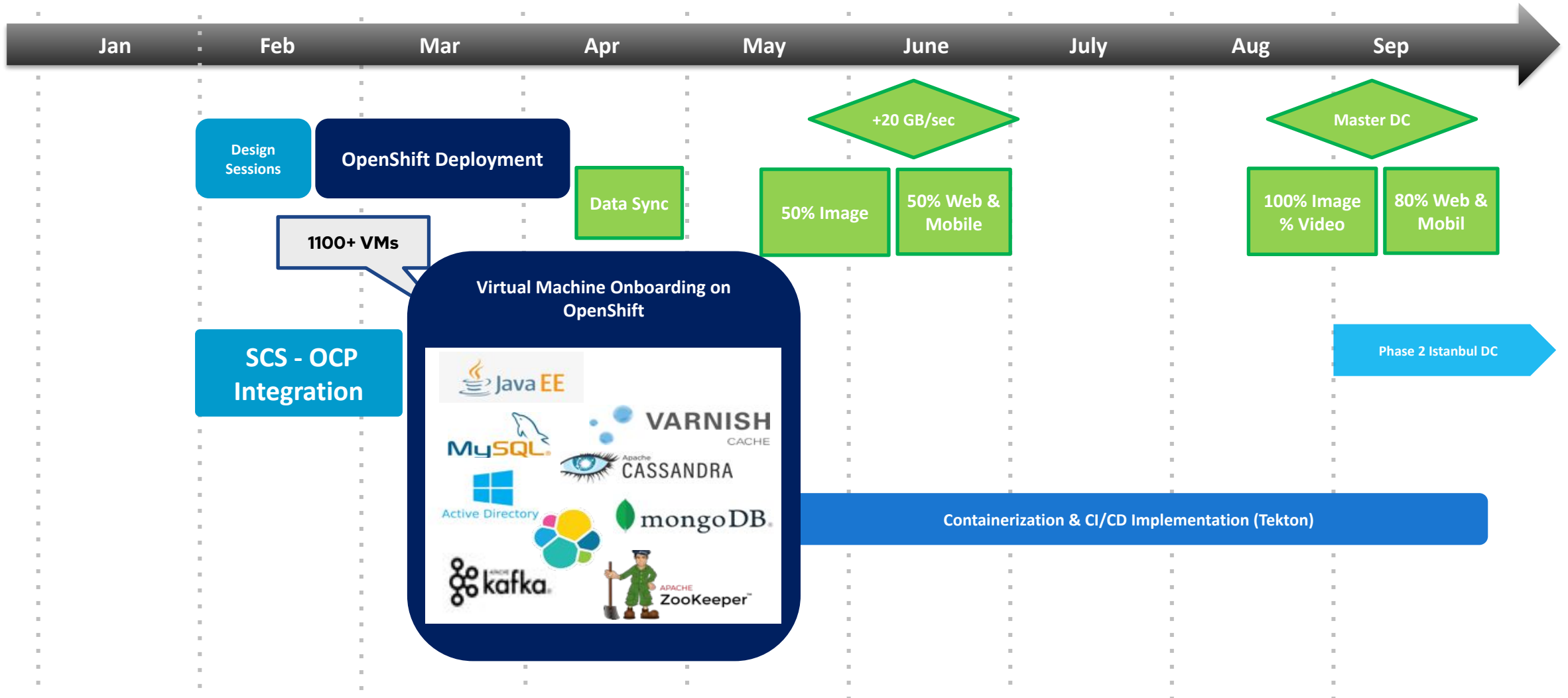
Virtual machines in a container world

- Provides a way to transition application components which can't be directly containerized into a Kubernetes system
  - Integrates directly into existing k8s clusters
  - Follows Kubernetes paradigms:
    - Container Networking Interface (CNI)
    - Container Storage Interface (CSI)
    - Custom Resource Definitions (CRD, CR)
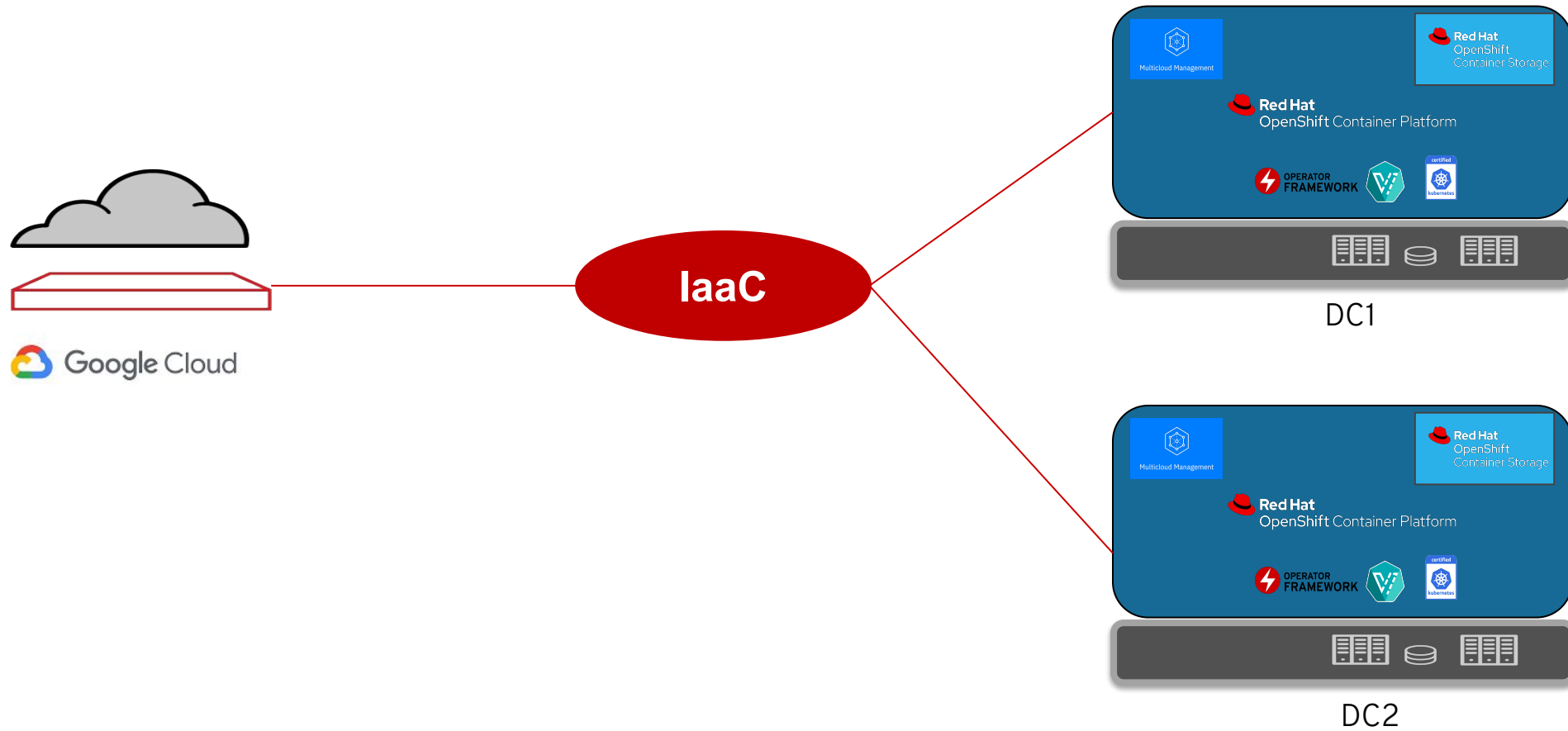- Schedule, connect, and consume VM resources as container-native

VM pod

App pod

A

OpenShift

RHEL CoreOS

Physical Machine

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The Journey

Project Timeline

Jan · Feb · Mar · Apr · May · June · July · Aug · Sep

- Design Sessions
- OpenShift Deployment
- 1100+ VMs
- SCS - OCP Integration
- Virtual Machine Onboarding on OpenShift
  - Java EE
  - MySQL
  - VARNISH CACHE
  - Apache CASSANDRA
  - Active Directory
  - mongoDB
  - kafka
  - APACHE ZooKeeper
- Data Sync
- +20 GB/sec
- 50% Image
- 50% Web & Mobile
- Master DC
- 100% Image % Video
- 80% Web & Mobil
- Phase 2 Istanbul DC
- Containerization & CI/CD Implementation (Tekton)

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To-Be Deployment Architecture

Container adoption framework

Objectives and pervasive themes

Objectives	Pilot	Expand	Evolve

Objectives

- ✓ Drive app dev self-service
- ✓ Improve time-to-market
- ✓ Reduce cost to operate
- ✓ Increase security
- ✓ Improve reliability
- ✓ Delight stakeholders

Process transformation: align IT with the organization and mission →

App onboarding: apps in production, teams enabled to run them →

Release engineering: end-to-end deployment pipeline repeatedly implementing CI/CD →

Infra, ops, and security: integration and operationalizing OpenShift →

Consulting, training, and support for Digital Leadership

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Container Adoption Journey Map

Transformation in bite-sized chunks
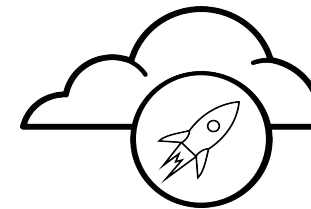
Pilot	Expand	Evolve

A meaningful workload runs in production on a minimally viable container platform managed by a select team

Application teams are enabled, repeatable onboarding processes are implemented and apps are migrated onto the platform

The platform is evolved with continuous security, enterprise integration, and cloud native development

Consulting, training, and support for Digital Leadership

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Red Hat Summit

Thank you

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