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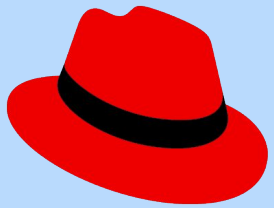

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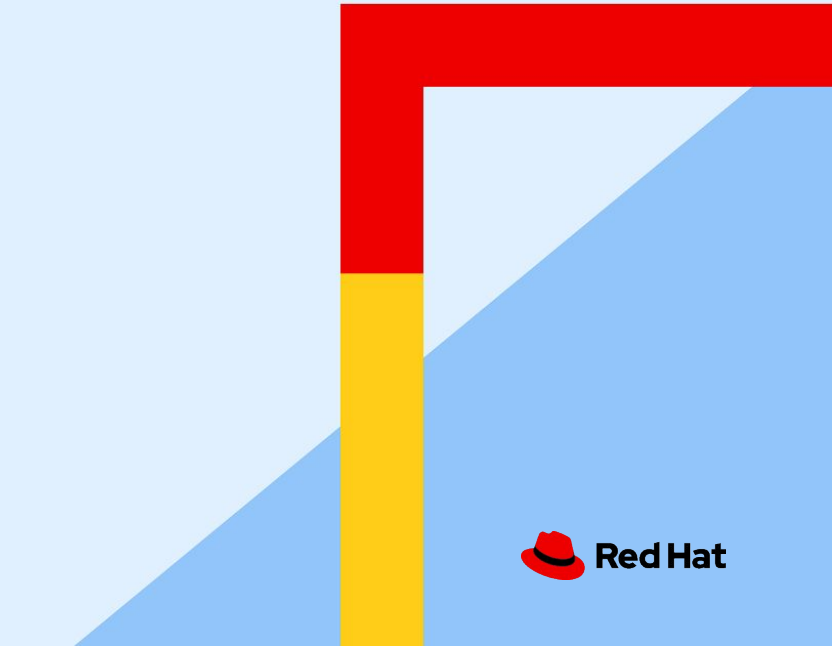
Preparing for a cloud native future with OpenShift Virtualization

Matt Kimberley
Senior Specialist Solution Architect
Red Hat

OpenShift



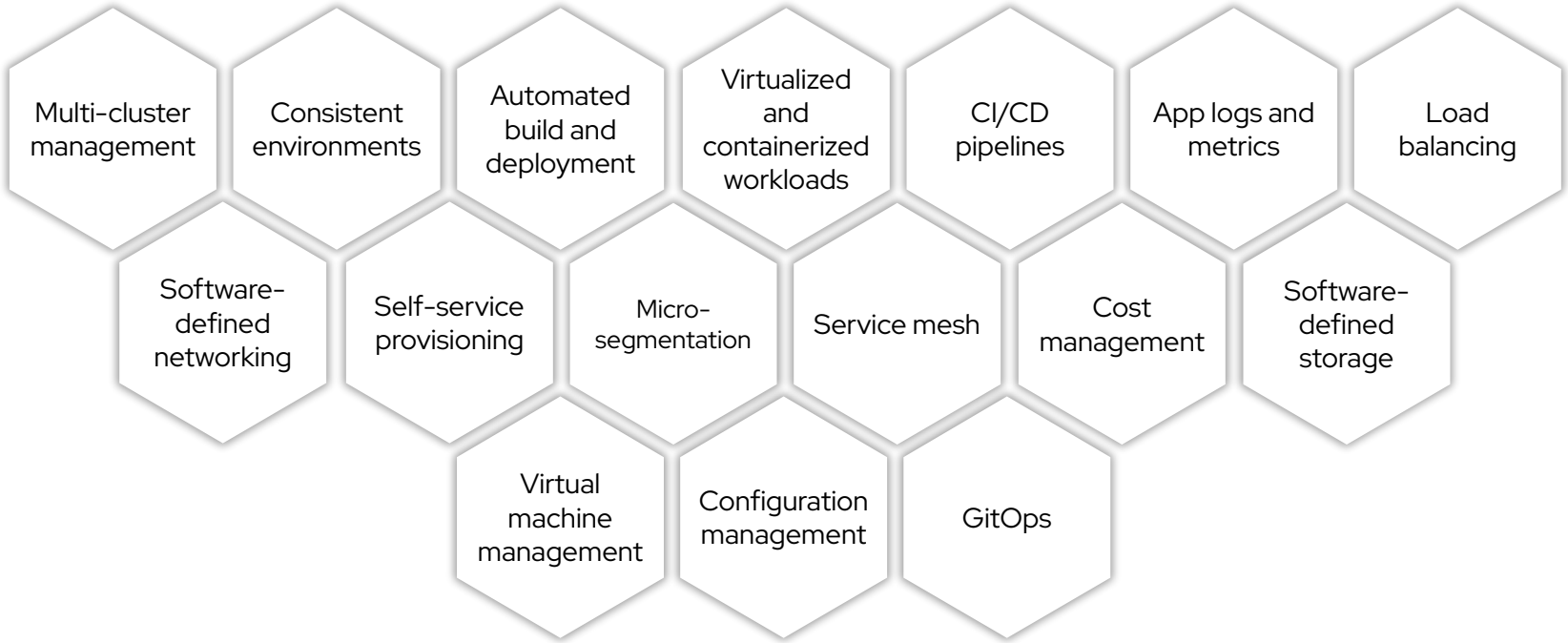
The Forrester Wave™: Multicloud Container Platforms, Q4 2023

"**Red Hat sets the pace with enterprise IT capabilities and massive market presence.** With OpenShift's systematic innovation and development on multiple fronts, Red Hat has helped transform the MCP market segment."

"The demand for OpenShift prompted AWS and Microsoft Azure to sell OpenShift as a managed service, despite having their own Kubernetes-based container services. Red Hat's differentiated strategic vision is to up the ante on enterprise-grade open source computing."

The Forrester Wave™: Multicloud Container Platforms, Q4 2023: The Eight Providers That Matter Most and How They Stack Up
Oct 2023

A Modern application platform with comprehensive lifecycle and infrastructure management



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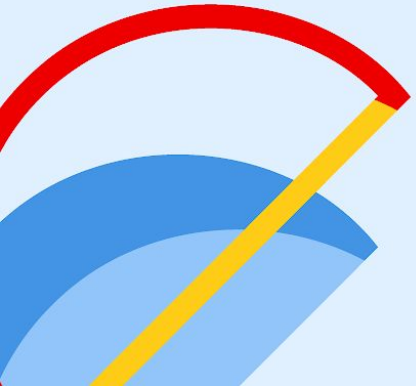
What problem are we solving?



We frequently hear from customers …

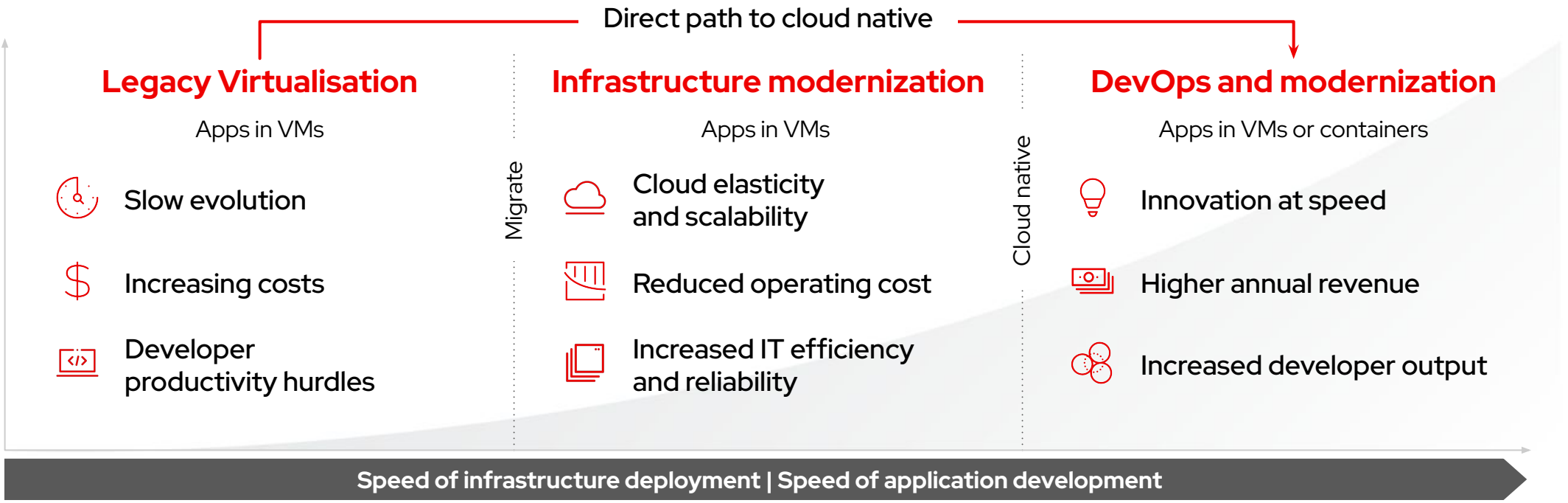
“I want to migrate ASAP”

- **Migrate off their current traditional Virtualisation platform completely**

“I want to modernize”

- **Want to run their VMs leveraging the benefits associated with a hybrid and modern cloud native approach, embracing VMs, Containers and AI Workloads across Hybrid / Multi Cloud Environments.**

Modernize at your own pace



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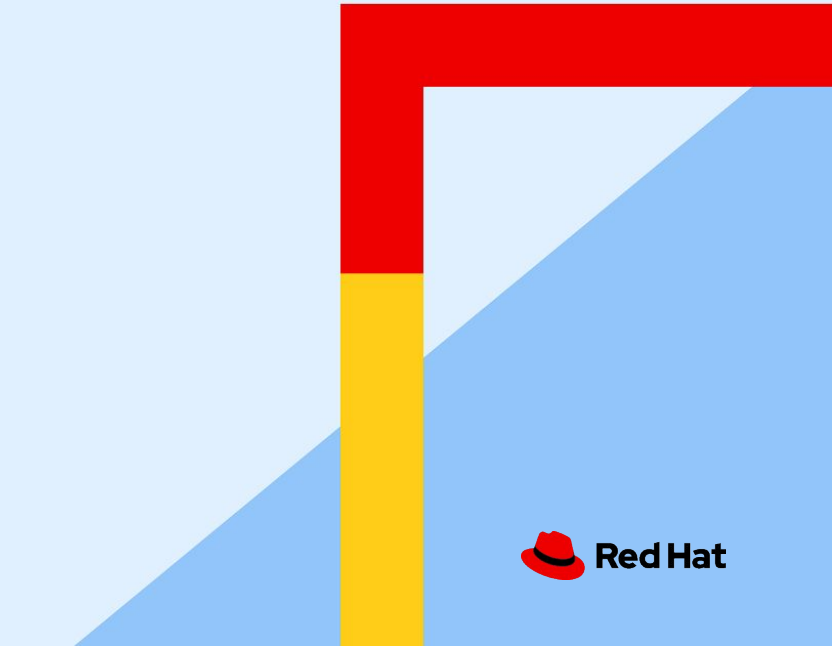
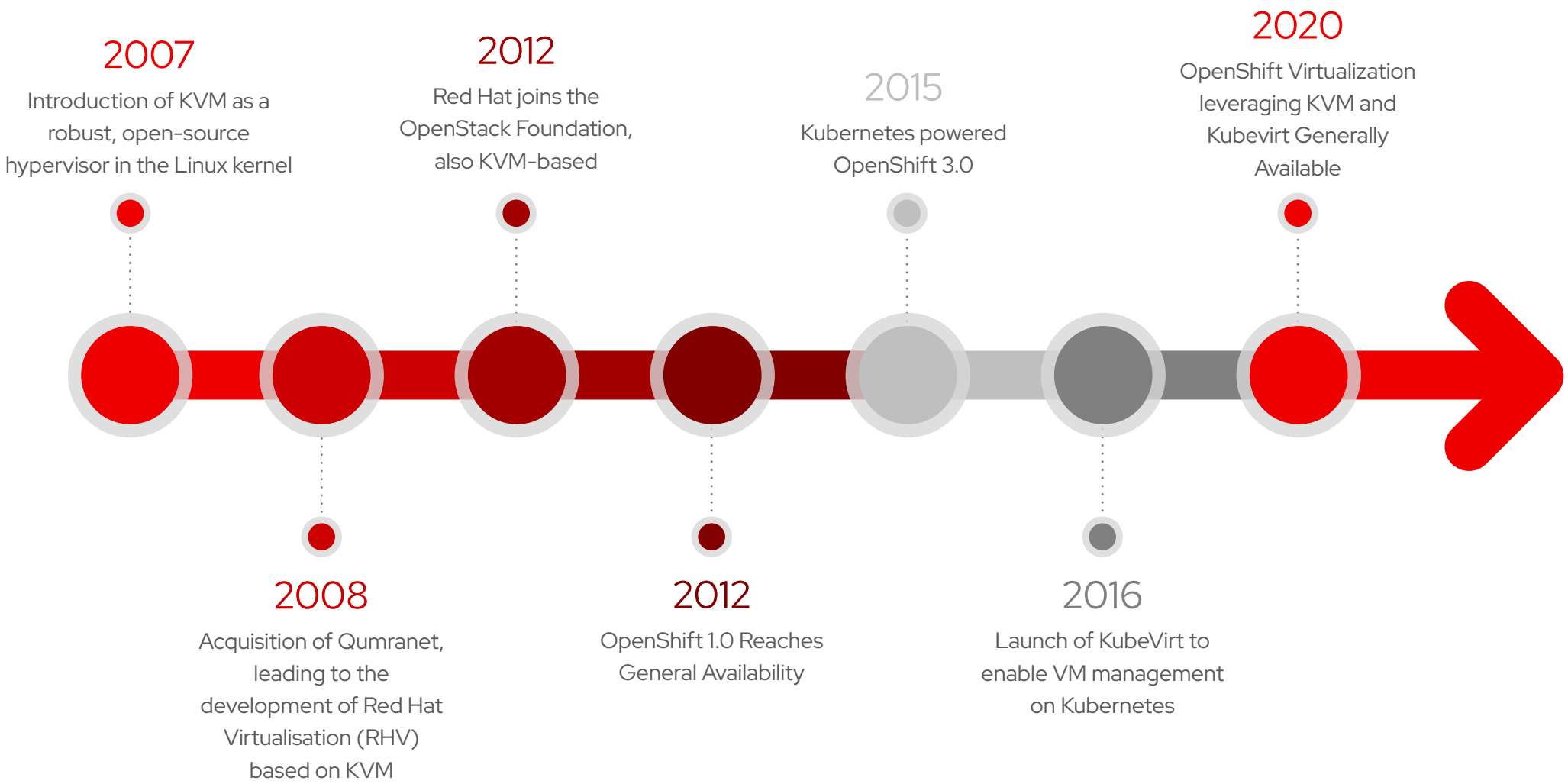
OpenShift Virtualization



Red Hat has a long history with Virtualisation



We have an extensive partner ecosystem

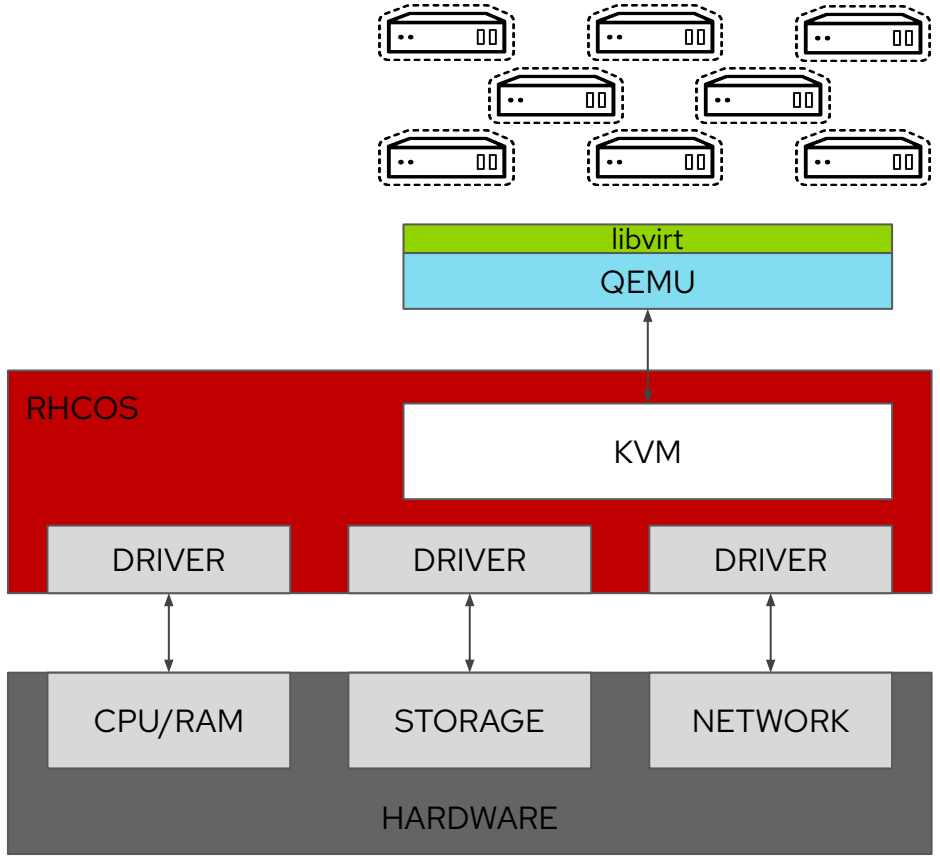
This is not an exhaustive list

OpenShift Virtualization

- Virtual machines
  - Run on the KVM Hypervisor on an OpenShift worker node
  - Managed by orchestration pod
- Scheduled, deployed, and managed by Kubernetes
  - Provides high availability in the event of OCP node outage
- Integrated with OpenShift resources and services
  - Traditional Pod-like SDN connectivity
  - Connectivity to external VLAN and other networks via multus
  - Persistent storage delivers storage to virtual machines

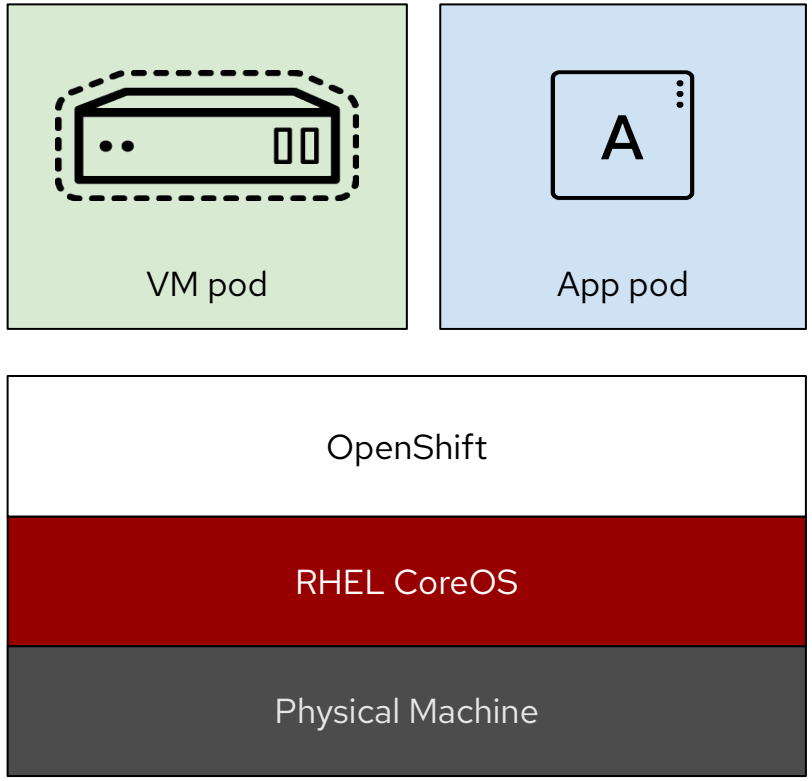
KVM

- KVM is well established long serving hypervisor
- KVM provides hardware Virtualisation
  - Used by Red Hat Virtualisation, Red Hat OpenStack Platform, and RHEL and others.
  - Operates on the OpenShift worker nodes
- QEMU provides hardware emulation
- libvirt provides a management abstraction layer and API for interaction with the virtual machines



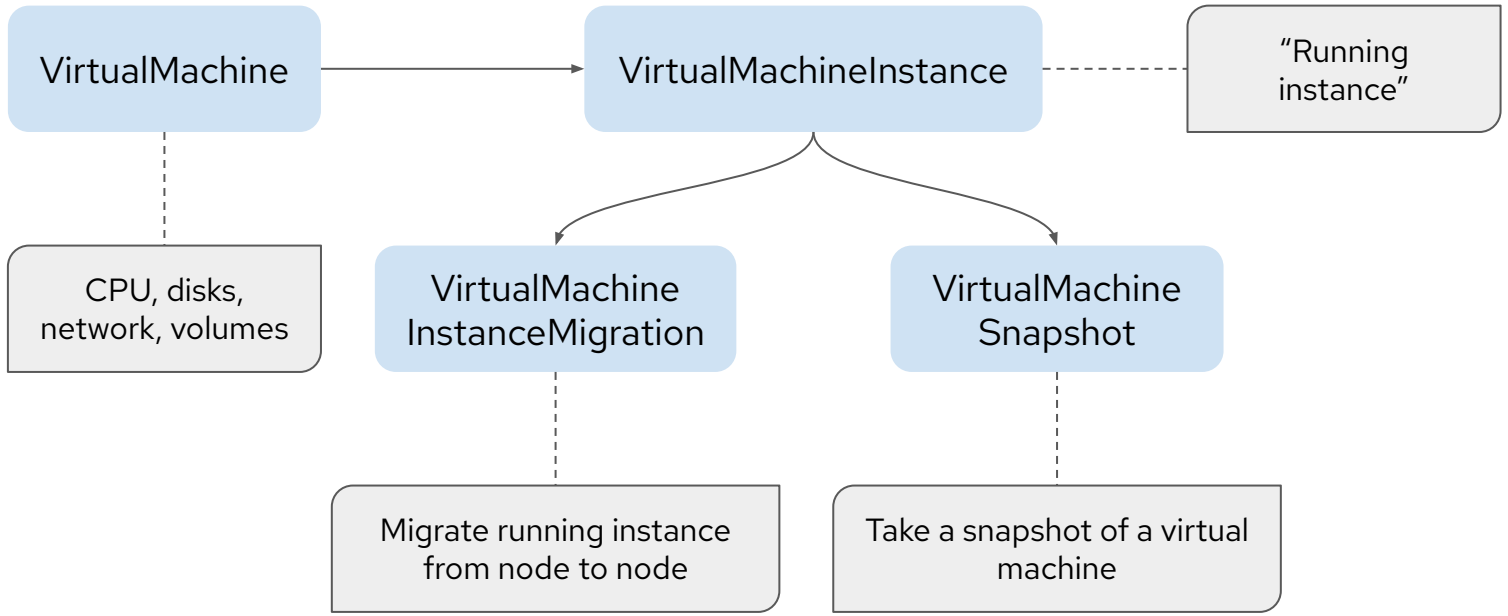
Virtual machines in a container world

- Transition application components (which can't be directly containerized) into an OpenShift environment
  - Integrates directly into OpenShift
  - 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



Virtualisation native to Kubernetes

New CustomResourceDefinitions (CRDs) for native VM integration




```yaml
apiVersion: kubevirt.io/v1alpha3
kind: VirtualMachine
metadata:
  labels:
    app: demo
    flavor.template.kubevirt.io/small: "true"
  name: rhel
spec:
  dataVolumeTemplates:
  - apiVersion: cdi.kubevirt.io/v1alpha1
    kind: DataVolume
    metadata:
      creationTimestamp: null
      name: rhel-rootdisk
    spec:
      pvc:
        accessModes:
        - ReadWriteMany
        resources:
          requests:
            storage: 20Gi
        storageClassName: managed-nfs-storage
        volumeMode: Filesystem
```

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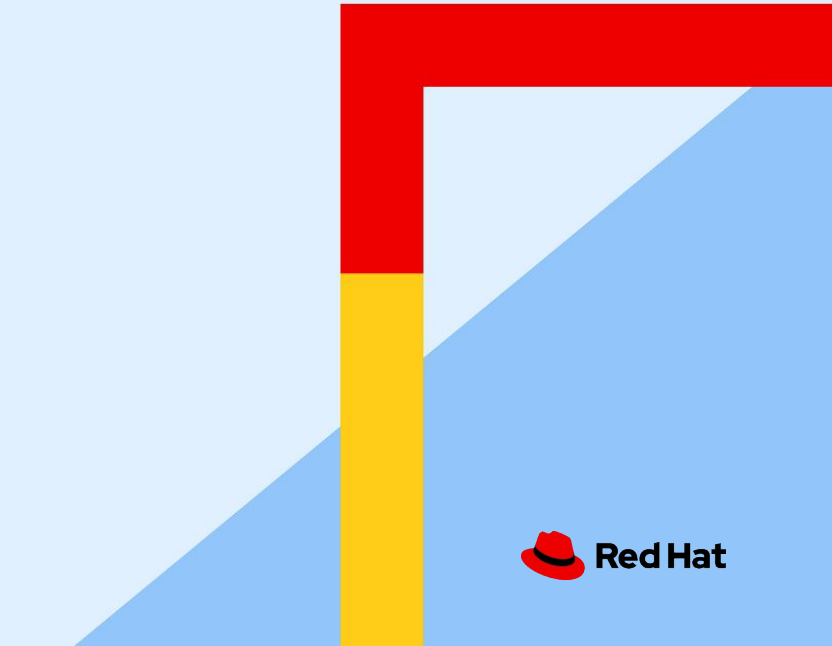
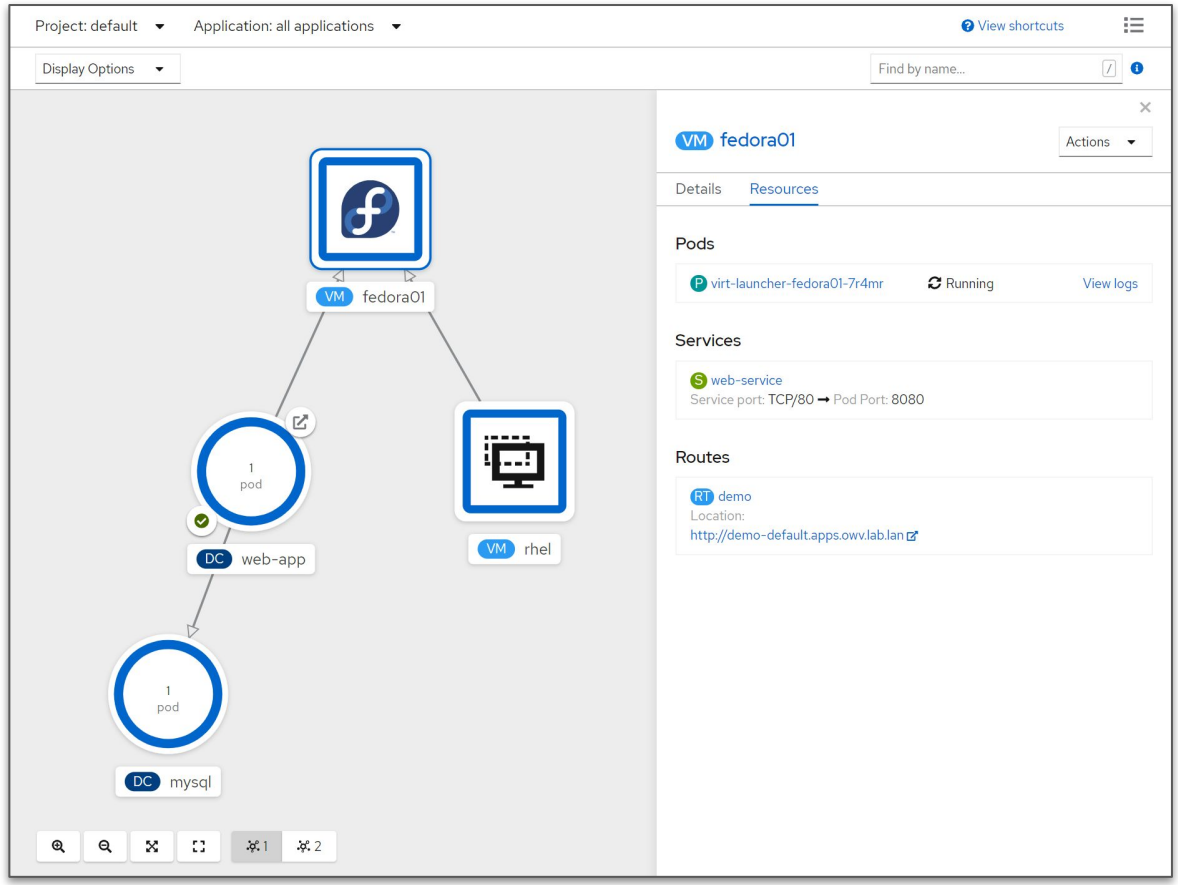
Microservices with VMs



Using VMs and containers together

- Virtual machines connected to pod networks are accessible using standard Kubernetes methods:
  - Service
  - Route
  - Ingress
- Network policies apply to VMs (via pods) the same as application pods
- VM-to-pod, and vice-versa, communication happens over SDN or ingress depending on network connectivity



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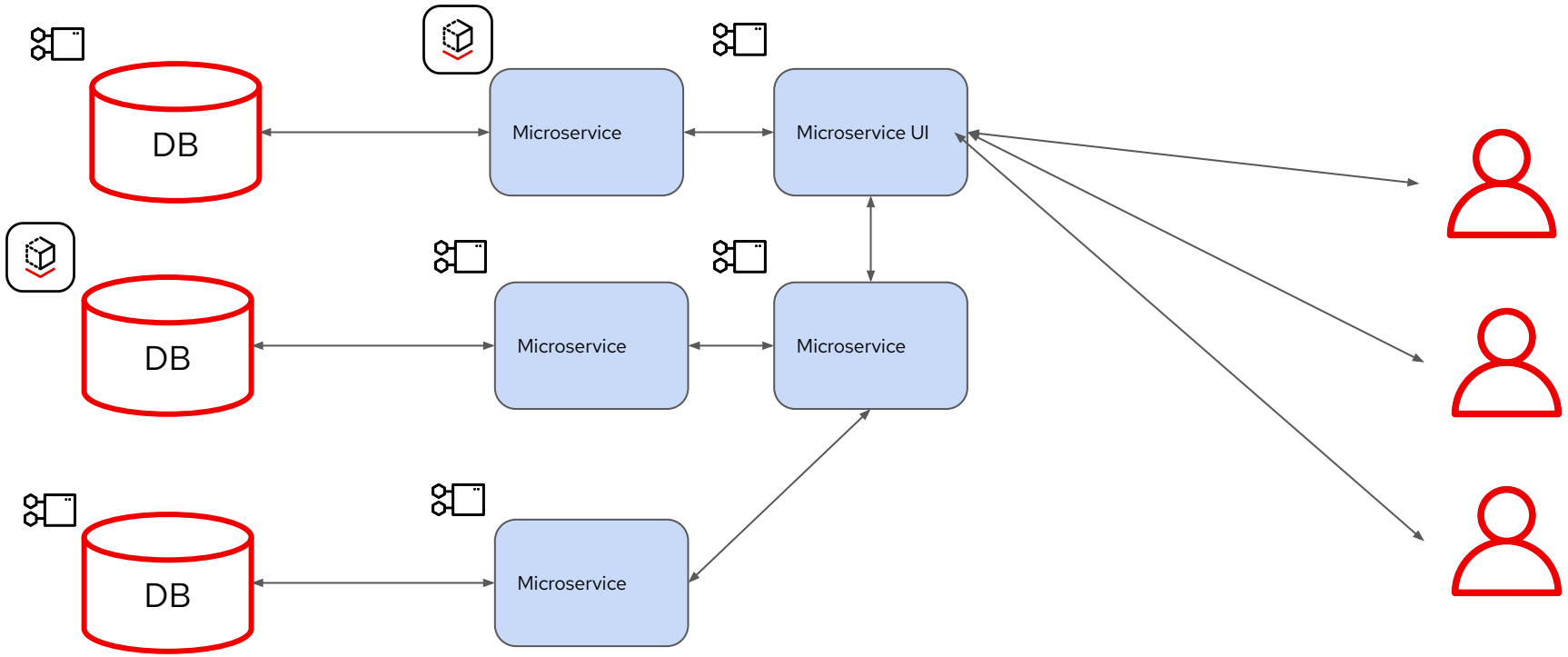
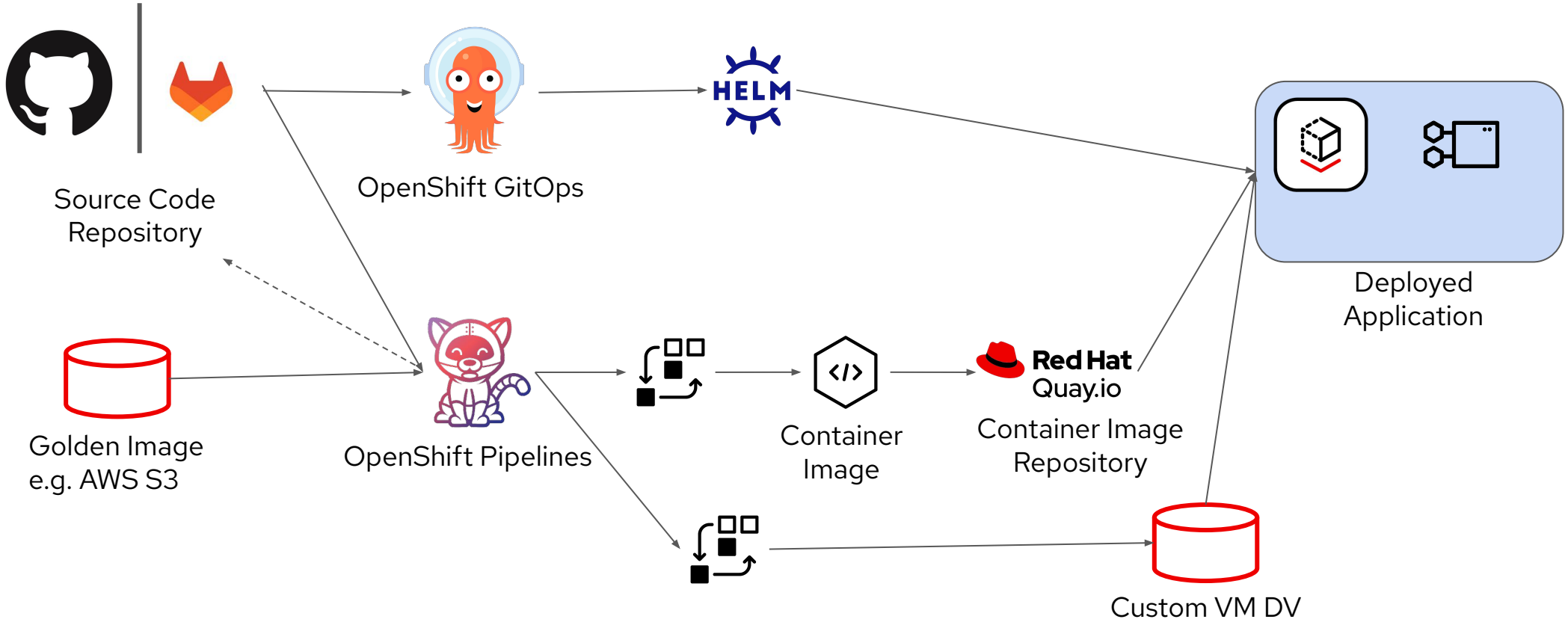
Microservices on OpenShift with VMs



- Availability at the Pod level, and node level
- Routing and LB controlled by routes and services
- Pod and VM deployment is quick and self serving in nature

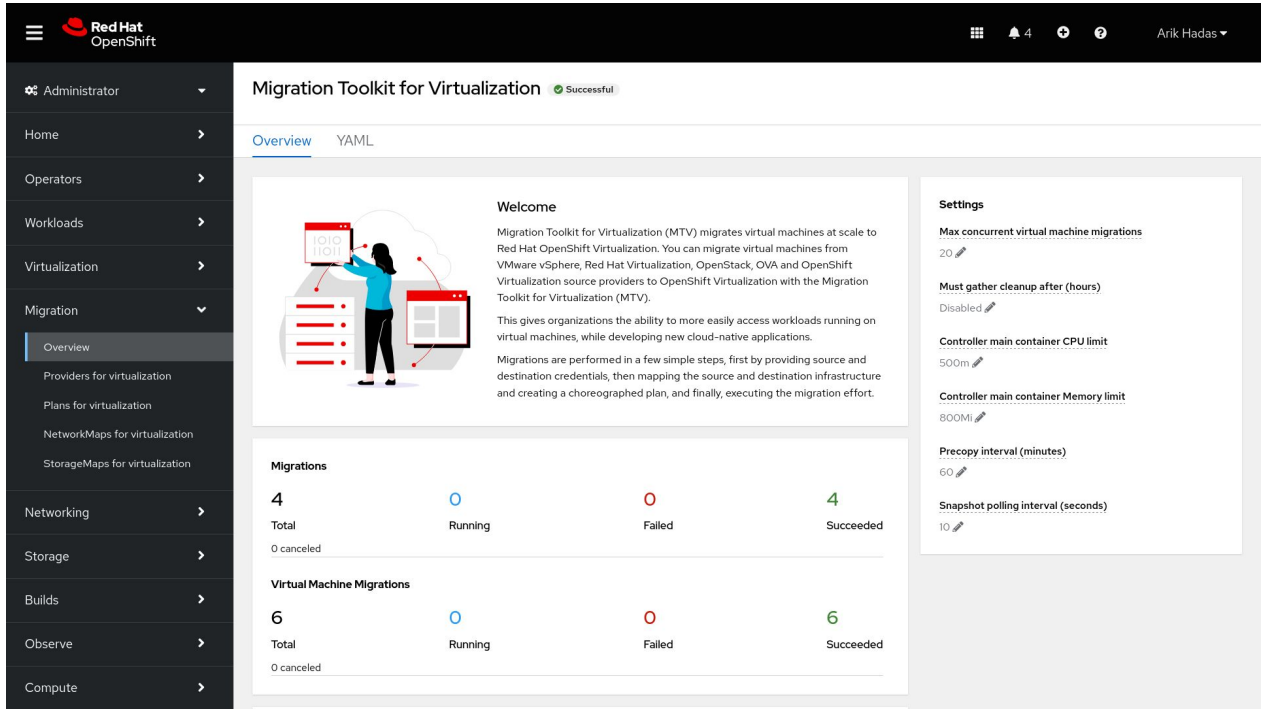
Cloud Native VM Builds

- Application Configuration
- Application Source Code
- Container Image files
- Virtual Machine Templates



Migrating VM-based applications with minimal disruption

Migration toolkit for Virtualisation (MTV) included with OpenShift



Mass migration of virtual machines

- Migrate virtual machines at scale to OpenShift Virtualization in a few simple steps
- Provide source and destination credentials, map infrastructure and create migration plans

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Get Hands-On with OpenShift Virtualization

OpenShift Virtualization Roadshow

A premier hands-on experience for VM admins

- Start the day with an overview of OpenShift Virtualization and then dive into a 4-hour lab with modules that cover: **environment review, VM creation and use, customization, management, live migration, networking, storage, migration tool kit, external load balancer, and backup and restore**
- Events are taking place globally
- **Sign up in a city near you** or ask for a roadshow to be ran at your company.
- Speak to you Account Manager!

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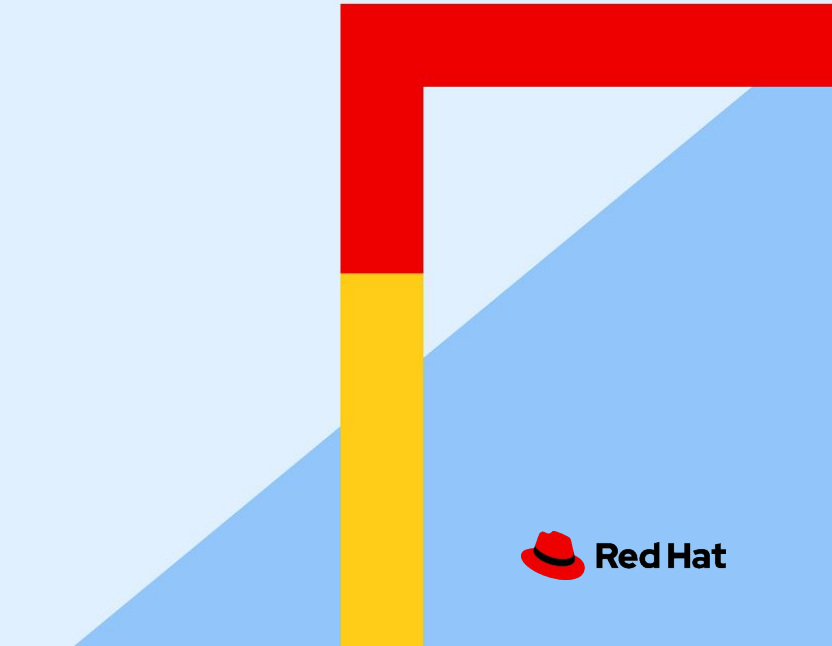
Q&A



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