Container-native Virtualization

The future of Virtualization!

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#RedHatOSD
Red Hat CloudForms + Red Hat Ansible® Automation

Red Hat Virtualization,
Red Hat OpenStack®
Platform, vSphere

AWS, Azure, GCP

Savings invested to develop cloud-native applications running on any footprint

Traditional Applications

Red Hat® OpenShift®

Reduce costs by 40-50% in infrastructure by dependence on VMware

Traditional Applications

Red Hat Virtualization,
Red Hat OpenStack®
Platform, vSphere

AWS, Azure, GCP

Increase investment in VMware, stay with traditional apps

Traditional Apps

vRealize

vSphere

AWS
CONTAINERS AND VIRTUAL MACHINES

CONTAINER INFRASTRUCTURE AND ORCHESTRATION
Containerized applications and Kubernetes container orchestration as provided by
OpenShift are becoming the standard for new applications.

VIRTUALIZED WORKLOADS
Virtualized workloads are not going anywhere fast! Business reasons (cost, time to
market) and technical reasons (different or older operating system)

BARE-METAL RESURGENCE
Increasingly customers are pursuing bare-metal clusters for net new business
functionality being built in containers.

As the technology mix changes, you will reach a tipping point where containers
are the default but some workloads are still more suited to run as VMs
COMPONENTS OF CNV

- **KubeVirt**
The virtual machine operator
https://github.com/kubevirt/kubevirt/

- **Containerized Data Importer (CDI)**
Importing disks
https://github.com/kubevirt/containerized-data-importer

- **OpenShift Web Console**
With UI extensions
https://github.com/openshift/origin-web-console

- **Containerized Virt-v2v**
Importing a whole virtual machine
https://github.com/kubevirt/v2v-job

Leverages tried and trusted RHEL & RHV (KVM) virtualization capabilities.
Container-native Virtualization Demo

http://kubevirt.io/get_kubevirt/

Pre-requisites:

- `kubectl`
- `minikube/minishift`

Notes:

- Yes, we’re running nested virt here - fine for getting started!
- Using upstream bits, for now, in product preview coming!
Let's look at the new pods our KubeVirt CRDs are running in the kube-system namespace.

The CDI controller runs in the default namespace.

Our own namespace is as expected empty right now.

No resources found.

Let's look at a VM definition.

Let's now create the VM.

The VirtualMachine object is the persistent representation of our virtual machine.
Supportability

- Simplify upgrade process
- Debug tooling support (sosreports, Insights)
- Broad provider support

Production Workloads

- Layer-2 Networking
- Live Migration
- Upload image as Template
- Guest agent introspection

Embrace the Platform

- Operators for all
- Integrated VM management
- Metrics and monitoring

Container-native Virtualization is **not** a drop-in replacement for traditional virtualization today.

**Technology Preview access in an upcoming release of OpenShift.**
OpenShift Container Platform 3.11

What’s new?

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Users have a choice of experience based on their role or technical abilities

- Admin/CaaS experience with heavy exposure to Kubernetes
- AppDev/PaaS experience with standard OpenShift UX
- Sessions are not shared across the Consoles but credentials are
- Both hosted on cluster, in openshift-console and openshift-webconsole namespaces
Visual management of the cluster’s RBAC Roles and RoleBindings

- Track down users and service accounts with a specific Role
- View cluster-wide or namespaced bindings
- Visually audit a Role’s verbs and objects

Project admins can self-manage roles and bindings scoped to their namespace
**CRI-O / BUILDAH / PODMAN**

- Becoming the default for partners
- Crictl for node debugging and troubleshooting
- Podman for image tagging & management
- Continues to mature with OpenShift online, customer, and community deployments

**cri-o**

- Start from an existing image or from scratch
- Generate new layers and/or run commands on existing layers
- Commit storage and generate the image manifest
- Deliver image to a local store or remote OCI / docker registry

**buildah**

- Podman is planned to GA with RHEL 7.6.
- A daemon-less CLI/API for running, managing, and debugging OCI containers and pods

**podman**

- CNI Networking
- RunC
- Storage
- Image

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**REFERENCE ARCHITECTURE GUIDES**

**Release:** ocpsupplemental-3.11 (in 4-6 weeks after 3.11 GA)

Since 3.10, Reference Architecture Implementation guides are now part of the OpenShift product documentation ([https://docs.openshift.com](https://docs.openshift.com)).

Documentation for deploying OCP 3.11 on: *(not live yet)*

- OpenShift 3.11 on Red Hat OpenStack Platform (RHOSP)
- OpenShift 3.11 on Amazon Web Services (AWS)
- OpenShift 3.11 on Microsoft Azure
- OpenShift 3.11 on VMware vSphere
- OpenShift 3.11 on Google Cloud Platform (GCP)
- OpenShift 3.9 on Red Hat Virtualization 4 (RHV) *(update in progress)*
LOCAL DEVELOPMENT

**CDK 3.6**
- OpenShift Container Platform v3.10.45 (and update to 3.11)
- Based on Minishift 1.24

**Minishift 1.24**
- Configuration used to start a profile is not saved
- Provide a way to modify the kube-apiserver config same as openshift-apiserver.
- Do not apply templates in xpaas addon one by one
- Local proxy server to handle proxy issues. (technology preview)

**kubectl**
- We always shipped kubectl for Linux on the master’s file system, but now we will offer it in the [oc client downloads](#)
... so you want to do containers and Kubernetes?
When faced with two or more alternatives that deliver roughly the same value:
Take the path that makes future changes easier.

Dave Thomas
Author of Manifesto for Agile Software Development
GRAZIE PER L’ATTENZIONE

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