Red Hat OpenShift

Advanced Install Options

Alfred Bach
PSA EMEA

Presenter's Name
Title

Red Hat

4.5 Supported Providers

Full Stack Automation (IPI)

Pre-existing Infrastructure (UPI)

Generally Available

PMs: Katherine Dubé (AWS, Azure, GCP), Maria Bracho (VMware), Peter Lauterbach (RHV & OCP Virtualization), Ramon Acedo Rodriguez (OSP, BM), & Duncan Hardie (IBM Z & Power)

OPENSHIFT PLATFORM Provider Roadmap & Minimum Supported Version

Provider	Full Stack Automation (installer-provisioned infrastructure)	Pre-existing Infrastructure (user-provisioned infrastructure)
Alibaba Cloud	TBD*	TBD*
aws	4.1	4.1
Microsoft Azure	4.2	4.3+ *(z-stream)*
Azure Stack Hub	4.7*	4.7*
Bare Metal	4.6*	4.1
Google Cloud Platform	4.2	4.2
Microsoft Hyper-V	-	TBD*
IBM Cloud	TBD*	TBD*
IBM Power Systems	-	4.3+ *(z-stream)*
IBM Z	-	4.2+ *(z-stream)*
packet AN EQUINIX COMPANY	TBD*	TBD*
RED HAT OPENSTACK PLATFORM	4.2	4.4
RED HAT VIRTUALIZATION	4.4	4.6*
vmware vSphere	4.5	4.1
vmware | aws **	4.6*	4.6*

** via VMware Validated Design (VVD)

* Tentatively planned & subject to change

PMs: Katherine Dubé (AWS, Azure, GCP), Maria Bracho (VMware), Peter Lauterbach (RHV), Ramon Acedo Rodriguez (OSP, BM), Duncan Hardie (IBM Z & Power)

Compact 3-node Clusters on Bare Metal (only)

Compact clusters for the Edge

- Allows minimal footprint clusters to be used for developer and Edge deployments
  - Reduces hardware costs and power requirements
- Comprised of just 3 control plane nodes without the need for any additional worker nodes
  - Application workloads are schedulable on the control plane nodes
  - Control plane remains highly available supporting upgrades
- Requires:
  - Setting worker replicas to 0 in install-config will configure master nodes as workers as well (any other value will set them as masters)
  - Temporary bootstrap node for initial cluster bring-up
  - External DNS and LB services
  - HAProxy for *.apps needs to be reconfigured to target masters (ensure health checks are enabled)
- Minimum system resource requirements for each control plane node are cumulative of master and worker requirements:
  - 6 vCPU, 24GB RAM, 200GB Storage
- Additional workers nodes can be added on Day 2

```
# Edit 'install-config.yaml' and ensure worker node replicas is set to '0':
  compute:
    name: worker
    platform: {}
    replicas: 0

$ ./openshift-install create ignition-configs --dir=<installation_directory>

INFO Consuming Install Config from target directory
WARNING Making control-plane schedulable by setting MastersSchedulable to true
for Scheduler cluster settings

# Install using documented workflow
```

Generally Available

Product Manager: Katherine Dubé

Assisted installer

4.6 Tech-Preview

Full stack automation
Cluster managed LB/DNS
Simplified flow - UI support
Hosted on OCM cloud.redhat.com

Minimum prerequisites
No dedicated bootstrap node
3 nodes cluster (M/W)
No DHCP hostname allocation
Jumpstart DNS (POC)
Jumpstart VIPs allocation
Host call home model (simplified network model)

Pre-install Validations
Minimum host requirements
Network connectivity/address matrix
...

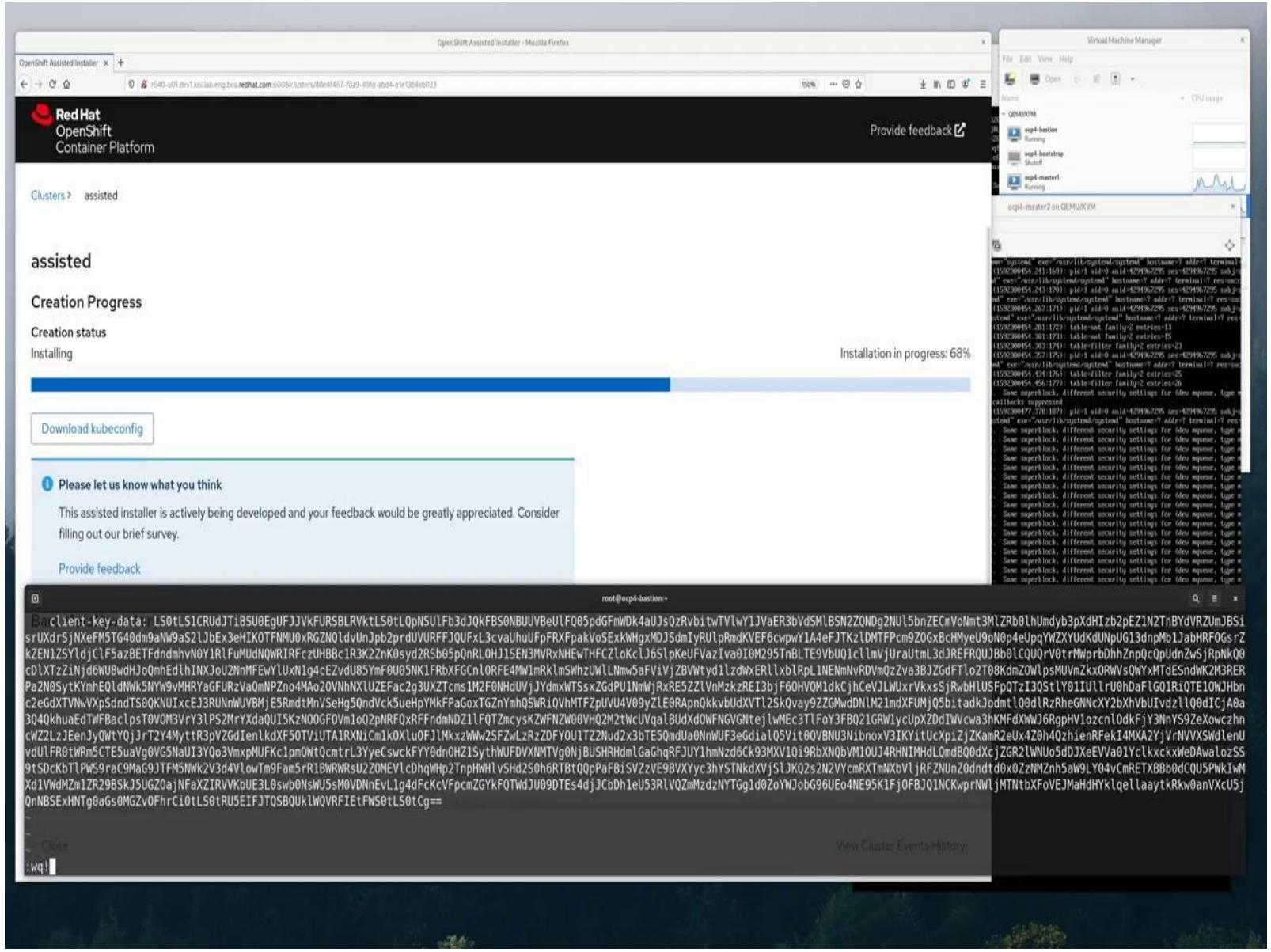
Smart defaults
Auto CIDR generation (based on available networks)
Auto node role assignment

Progress monitor and error handling

Deploying Red Hat OpenShift on Bare Metal is easy..

PM: Moran Goldboim/Ramon Acedo Rodriguez

https://github.com/openshift/assisted-installer


OpenShift Assisted Installer - Mozilla Firefox
OpenShift Assisted Installer
Red Hat
OpenShift
Container Platform
Provide feedback
Clusters › assisted
assisted
Creation Progress
Creation status
Installing
Installation in progress: 68%
Download kubeconfig
Please let us know what you think
This assisted installer is actively being developed and your feedback would be greatly appreciated. Consider filling out our brief survey.
Provide feedback
Virtual Machine Manager
root@ocp4-bastion:~
client-key-data: LS0tLS1CRUdJTiBSU0EgUFJJVkFURSBLRVktLS0tLQpNSUlFb3dJQkFBS0NBUUVBeUlFQ05pdGFmWDk4aUJsQzRvbitwTVlwY1JVaER3bVdSMlBSN2ZQNDg2NUl5bnZECmVoNmt3MlZRb0lhUmdyb3pXdHIzb2pEZ1N2TnBYdVRZUmJBSisrUXdrSjNXeFM5TG40dm9aNW9aS2lJbEx3eHIKOTFNMU0xRGZNQldvUnJpb2prdUVURFFJQUFxL3cvaUhuUFpFRXFpakVoSExkWHgxMDJSdmIyRUlpRmdKVEF6cwpwY1A4eFJTKzlDMTFPcm9ZOGxBcHMyeU9oN0p4eUpqYWZXYUdKdUNpUG13dnpMb1JabHRFOGsrZkZEN1ZSYldjClF5azBETFdndmhvN0Y1RlFuMUdNQWRIRFczUHBBc1R3K2ZnK0syd2RSb05pQnRLOHJ1SEN3MVRxNHEwTHFCZloKclJ6SlpKeUFVazIva0I0M295TnBLTE9VbUQ1cllmVjUraUtmL3dJREFRQUJBb0lCQUQrV0trMWprbDhhZnpQcQpUdnZwSjRpNkQ0cDlXTzZiNjd6WU8wdHJoQmhEdlhINXJoU2NnMFEwYlUxN1g4cEZvdU85YmF0U05NK1FRbXFGCnlORFE4MW1mRklmSWhzUWllLNmw5aFViVjZBVWtyd1lzdWxERllxblRpL1NENmNvRDVmQzZva3BJZGdFTlo2T08KdmZOWlpsMUVmZkxORWVsQWYxMTdESndWK2M3RERPa2N0SytKYmhEQldNWk5NYW9vMHRYaGFURzVaQmNPZno4MAo2OVNhNXlUZEFac2g3UXZTcms1M2F0NHdUVjJYdmxWTSsxZGdPU1NmWjRxRE5ZZlVnMzkzREI3bjF6OHVQM1dkCjhCeVJLWUxrVkxsSjRwbHlUSFpQTzI3QStLY01IUllrU0hDaFlGQ1RiQTE1OWJHbnc2eGdXTVNwVXpSdndT50QKNUIxcEJ3RUNnWUVBMjE5RmdtMnVSeHq5QndVck5ueHpYMkFPaGoxTGZnYmhQSWRiQVhMTFZpUVU4V09yZlE0RApnQkkvbUdXVTl2SkQvay9ZZGMwdDNlM21mdXFUMjQ5bitadkJodmtlQ0dlRzRheGNNcXY2bXhVbUIvdzllQ0dICjA0a3Q4QkhuaEdTWFBaclpsT0VOM3VrY3lPS2MrYXdaQUI5KzNOOGFOVm1oQ2pNRFQxRFFndmNDZ1lFQTZmcysKZWFNZW00VHQ2M2tWcUVqalBUdXdOWFNGVGNtejlwMEc3TlFoY3FBQ21GRW1ycUpXZDdIWVcwa3hKMFdXWWJ6RgpHV1ozcnlOdkFjY3NnYS9ZeXowczhncWZ2LzJEenJyOWtYQjJrT2Y4MyttR3pVZGdIenlkdXF5OTViUTA1RXNiCm1kOXluOFJlMkxzWWw2SFZwLzRzZDFYOU1TZ2Nud2x3bTE5QmdUa0NnWUF3eGdialQ5Vit0QVBNU3NibnoxV3IKYitUcXpiZjZKamR2eUx4Z0h4QzhienRFekI4MXA2YjVrNVVXSWdlenUvdUlFR0twRm5CTE5uaVg0VG5NaUI3YQo3VmxpMUFKc1pmQWtQcmtrL3YyeCswckFJlWkxzWWw2SFZwLzRzZDFYOU1TZ2Nud2x3bTE5QmdUa0NnWUF3eGdialQ5Vit0QVBNU3NibnoxV3IKYitUcXpiZjZKamR2eUx4Z0h4QzhienRFekI4MXA2YjVrNVVXSWdlenU9t5DcKbTlPWS9raC9MaG9JTFM5NWk2V3d4VlowTm9Fam5rR1BWRWRsU2ZOMEVlcDhqWHp2TnpHWHlvSHd2S0h6RTBtQQpPaFBiSVZzVE9BVXYyc3hYSTNkdXVjSlJKQ2s2N2VYcmRXTmNXbVljRFZNUnZ0dndtd0x0ZzNMZnh5aW9LY04vCmRETXB8b0dCQU5PWkIwMXd1VWdMZm1ZR29BSkJ5UGZOajNFaXZIRVVKbUE3L0swb0NsWU5sM0VDNnEvL1g4dFcKcVFpcmZGYkFQTWdJU09DTEs4djJCbDh1eU53RlVQZmMzdzNYTGg1d0ZoYWJobG96UEo4NE95K1FjOFBJQ1NCKwprNWljMTNtbXFoVEJMaHdHYklqellaaytkRkw0anVXcU5jQnNBSExHNTg0aGs0MGZvOFhrCi0tLS0tRU5EIFJTQSBQUklWQVRFIEtFWS0tLS0tCg==
:wq!

Red Hat

Full stack automation installation on Bare Metal

Deploying Red Hat OpenShift on Bare Metal with Installer-Provisioned Infrastructure

Bare Metal Management

Powered by Metal^3 and OpenStack Ironic under the hood

Host Power Management

Redfish, IPMI, iDrac, iLo.

Provisioning over the network

Installation over DHCP/PXE or Virtual Media

Disconnected Installations

RHCOS image cache and disconnected registry

Metal^3

OpenStack Ironic

```
apiVersion: v1
basedomain: <domain>
metadata:
  name: <cluster-name>
networking:
  machineCIDR: <public-cidr>
  networkType: OVNKubernetes
compute:
- name: worker
  replicas: 2
controlPlane:
  name: master
  replicas: 3
  platform:
    baremetal: {}
```

```
platform:
  baremetal:
    apiVIP: <api-ip>
    ingressVIP: <wildcard-ip>
    provisioningNetworkInterface: <NIC1>
    provisioningNetworkCIDR: <CIDR>
    hosts:
      - name: openshift-master-0
        role: master
        bmc:
          address: ipmi://<out-of-band-ip>
          username: <user>
          password: <password>
        bootMACAddress: <NIC1-mac-address>
        hardwareProfile: default
      - name: openshift-master-1
        role: master
        bmc:
          address: ipmi://<out-of-band-ip>
          username: <user>
          password: <password>
        bootMACAddress: <NIC1-mac-address>
        hardwareProfile: default
```

https://openshift-kni.github.io/baremetal-deploy

PM: Ramon Acedo Rodriguez

Deploy OpenShift to VMware vSphere

Simplified OpenShift cluster creation on VMware vSphere

- Easily provision “best practices” OpenShift cluster on VMware vSphere 6.5 & 6.7
- CLI-based guided workflow requires only minimal input to provision underlying Infrastructure significantly reducing complexity & deployment time
- Installer handles downloading RHEL CoreOS image and uploading it to vSphere for connected environments
- Machine API support for automated machine provisioning using MachineSets or node autoscaler
- Installer connects to the vCenter API to provide selection options and choices with only one option are selected by default.
- Installation requires:
  - Access to the vCenter API, so root CA certificates must be added to the system trust before connecting to the API
  - Two user-provisioned static IP addresses for cluster API and ingress traffic
  - User account requires privileges to read and create the necessary infrastructure resources

```
$ ./openshift-install create cluster --dir ./demo
? SSH Public Key /home/user_id/.ssh/id_rsa.pub
? Platform vsphere
? vCenter vcsa.vmware.example.com
? Username user@e2e.local
? Password [? for help] ********************
INFO Connecting to vCenter vcsa.vmware.example.com
? Datacenter example-datacenter
? Cluster example-cluster
? Default Datastore example-datastore
? Network example-network
? Virtual IP Address for API 123.123.12.1
? Virtual IP Address for Ingress 123.123.12.2
? Base Domain example.com
? Cluster Name mycluster
? Pull Secret [? for help] ************************************************************
INFO Consuming Install Config from target directory
INFO Creating infrastructure resources...
INFO Waiting up to 30m0s for the Kubernetes API at
https://api.mycluster.example.com:6443...
INFO API v1.18.2 up
INFO Waiting up to 30m0s for bootstrapping to complete...
INFO Destroying the bootstrap resources...
INFO Waiting up to 30m0s for the cluster at https://api.mycluster.example.com:6443 to
initialize...
INFO Waiting up to 10m0s for the openshift-console route to be created...
INFO Install complete!
INFO To access the cluster as the system:admin user when using 'oc', run 'export
KUBECONFIG=/home/user/auth/kubeconfig'
INFO Access the OpenShift web-console here:
https://console-openshift-console.apps.mycluster.example.com
INFO Login to the console with user: kubeadmin, password: 5char-5char-5char-5char
```

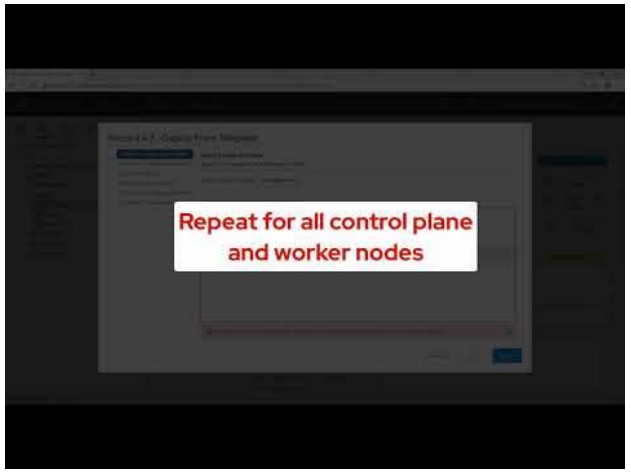
Generally Available

Product Manager: Maria Bracho

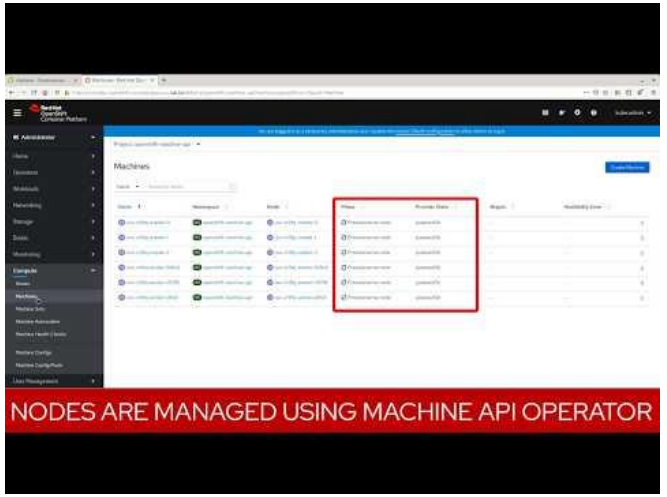
Install on VMWare vSphere

Dokumentation
https://docs.openshift.com/container-platform/4.5/installing/installing_vsphere/installing-vsphere.html

UPI Install



IPI Install



Red Hat OpenShift (OCP) V4 on IBM Z and LinuxONE

- takes advantage of the underlying enterprise capabilities
  - grow to **thousands of Linux guests**
  - and **millions of containers**
- non-disruptively grow, vertical and horizontal scalability
  - including advanced security
  - **confidential Cloud Computing,** including **FIPS 140-2 Level 4** certification

These capabilities were highlighted with the recent announcement of the IBM z15 and IBM LinuxONE III. Running Red Hat OpenShift on IBM Z and LinuxONE also enables cloud native applications to easily integrate with existing data and applications on these platforms, reducing latency by avoiding network delays.

Red Hat

OpenShift on IBM Z & P

Here comes the POWER ...

- In a near future 4.3 zStream we will update support of IBM Z and **add** IBM Power
  - Releases for future OCP versions will remain zStream for now
- Only certain pieces of OCP platform are supported initially
- This is a UPI installation based on zVM or bare metal on Power
- This is a homogeneous cluster.
  - One cluster for Z and a different clusters for x86 (or P)
  - No support for RHEL7 workers
- Remember good for:
  - Data Gravity
  - Security/Compliance
  - Cloud in a box

Supported

- OpenShift Core (CVO Operators)
- UPI installer
- OVS/OVN
- RHEL7 Based container support
- RHEL CoreOS
- Ansible Engine
- Red Hat Software Collections
- AdoptOpenJDK with OpenJ9
- OpenShift Cluster Monitoring (Prometheus, grafana)
- Node Tuning Operator
- OpenShift Jenkins
- OpenShift Logging (elasticSearch, kibana)
- Machine Configuration Operator (used in IPI installs)
- Node Feature Discovery Operator

Addons not currently supported

- CodeReady odo (Developer Command line)
- CodeReady Workspaces
- CodeReady Containers
- OpenShift Pipelines (Tekton)
- Red Hat Single Sign-On
- JBoss Web Server (tomcat)
- dotNET on RHEL (* not available on any non x86_64 arch)
- Container Native Virtualization (kubeVirt)
- OpenShift Service Mesh (istio, jaeger, kiali)
- OpenShift Serverless (knative, FaaS integrations)
- OpenShift Metering (Presto, Hive)
- Multus Plugins (SR-IOV, IPVAN, Bridge with VLAN, Static IPAM)
- Special Resources Operator
- Device Manager for NVIDIA GPUs
- IPI installer
- OpenShift Ansible Service Broker Operator (deprecated)
- Local Storage Operator

Extra content not ported

- Red Hat Middleware products
- OpenShift Container Storage
- operatorHub.io 3rd party ISV Eco-System
- Red Hat Quay (on premise)

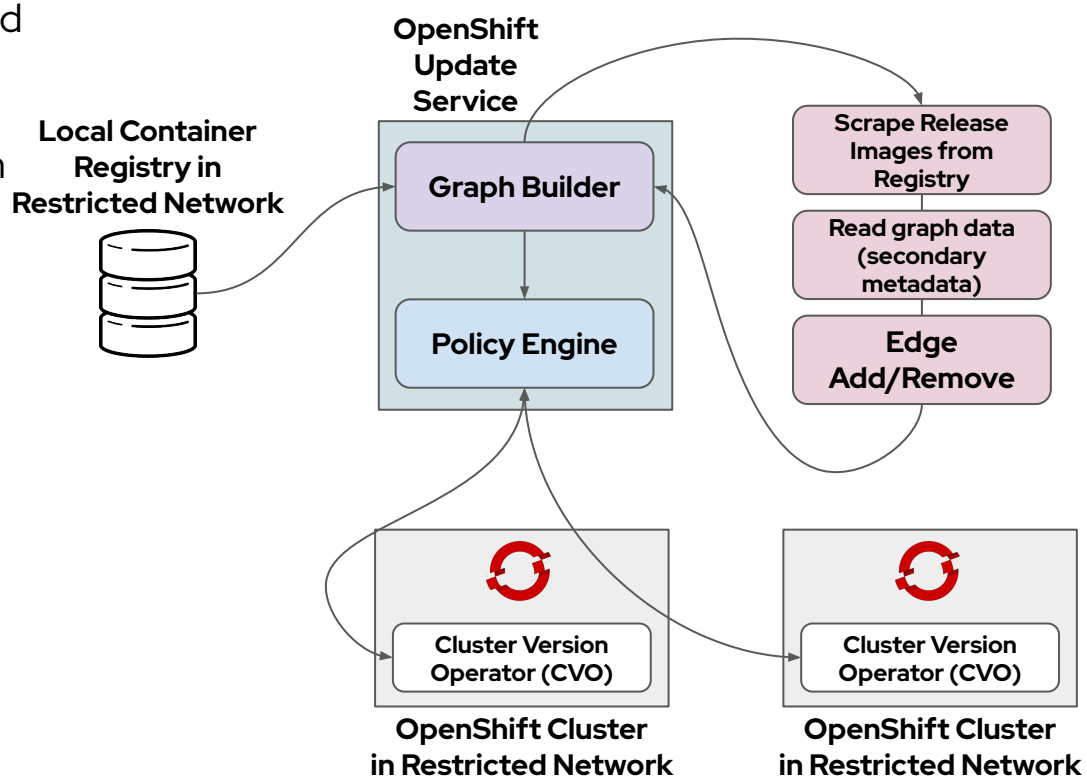
Product Manager: Duncan Hardie

Install on IBM Z

OpenShift Update Service

Update manager for your clusters in restricted networks

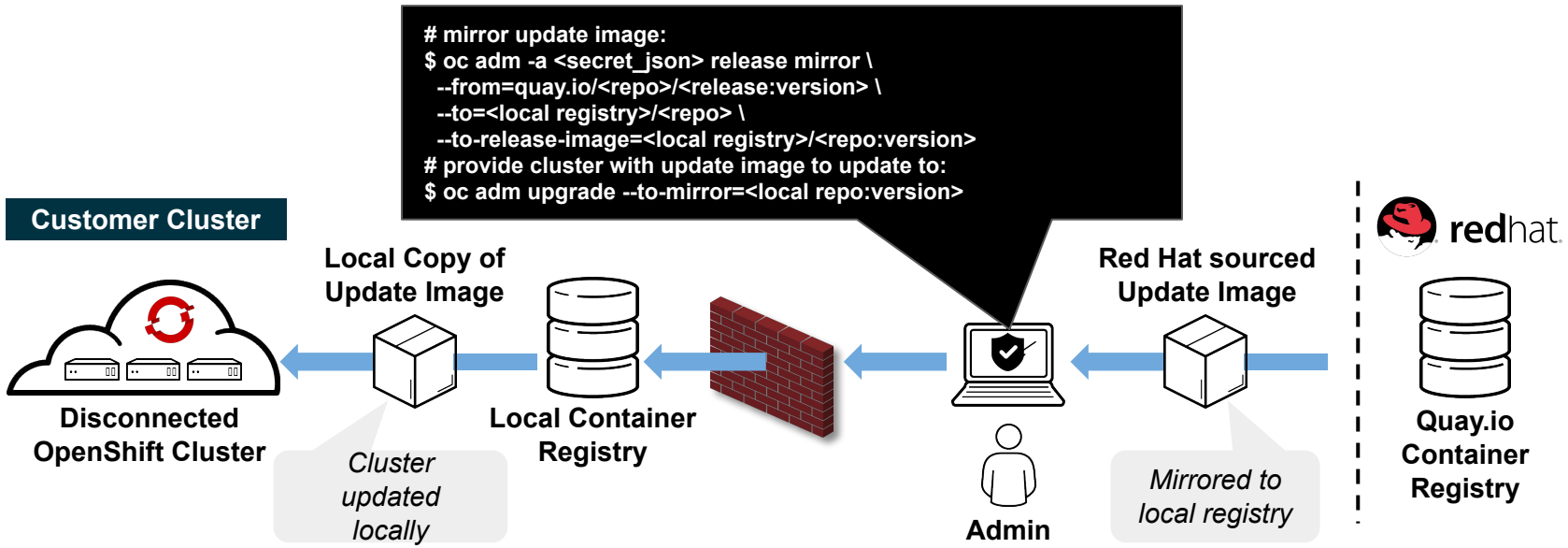
- OpenShift Update Service (OSUS) is the on-premise release of Red Hat's hosted update service
- Supports the publishing of upgrade graph information to clusters in restricted networks
- Provides clusters with a list of next recommended update versions based on the current version installed on the cluster
- Comprised of two services:
  - **Graph Builder:** Fetches OpenShift release payload information (primary metadata) from any container registry (compatible with Docker registry V2 API) and builds a directed acyclic graph (DAG) representing valid upgrade edges
  - **Policy Engine:** Responsible for selectively serving updates to every cluster by altering a client's view of the graph with a set of filters
- GA release planned for post-4.6 and will be distributed on Operator Hub as an optional add-on operator
- Blog post announcing OpenShift Update Service



Red Hat

PM: Katherine Dubé

Disconnected “Air-gapped” Installation & Upgrading



Overview

- 4.2 introduces support for installing and updating OpenShift clusters in disconnected environments
- Requires local Docker 2.2 spec compliant container registry to host OpenShift content
- Designed to work with the user provisioned infrastructure deployment method
  - *Note: Will not work with Installer provisioned infrastructure deployments*

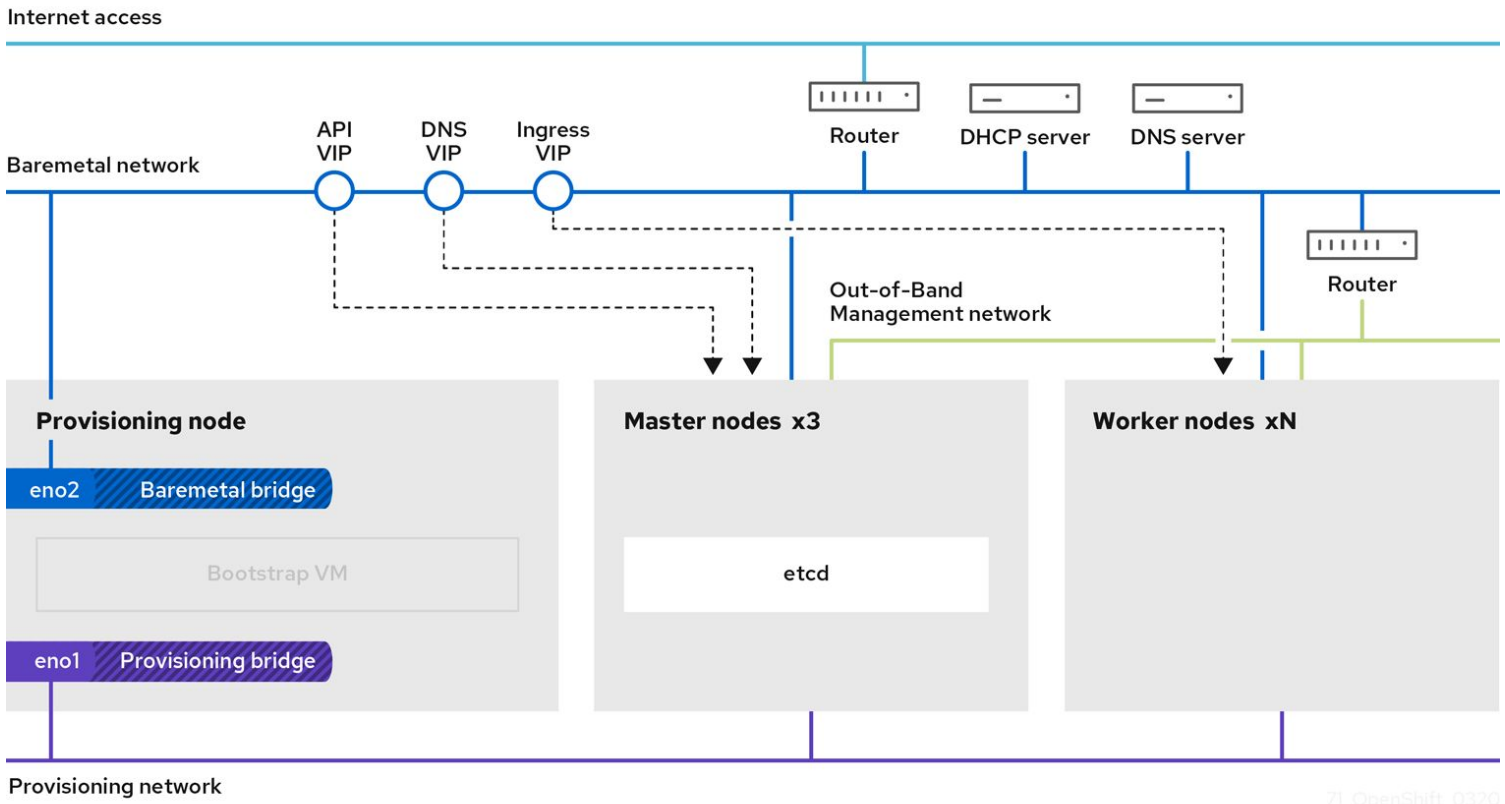
Installation Procedure

- Mirror OpenShift content to local container registry in the disconnected environment
- Generate install-config.yaml: $ ./openshift-install create install-config --dir <dir>
  - Edit and add pull secret (PullSecret), CA certificate (AdditionalTrustBundle), and image content sources (ImageContentSources) to install-config.yaml
- Set the OPENSHIFT_INSTALL_RELEASE_IMAGE_OVERRIDE environment variable during the creation of the ignition configs
- Generate the ignition configuration: $ ./openshift-install create ignition-configs --dir <dir>
- Use the resulting ignition files to bootstrap the cluster deployment

Red Hat

Full stack automation installation on Bare Metal

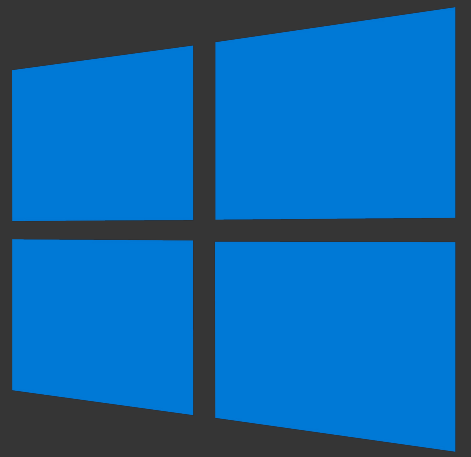
Deploying Red Hat OpenShift on Bare Metal with Installer-Provisioned Infrastructure



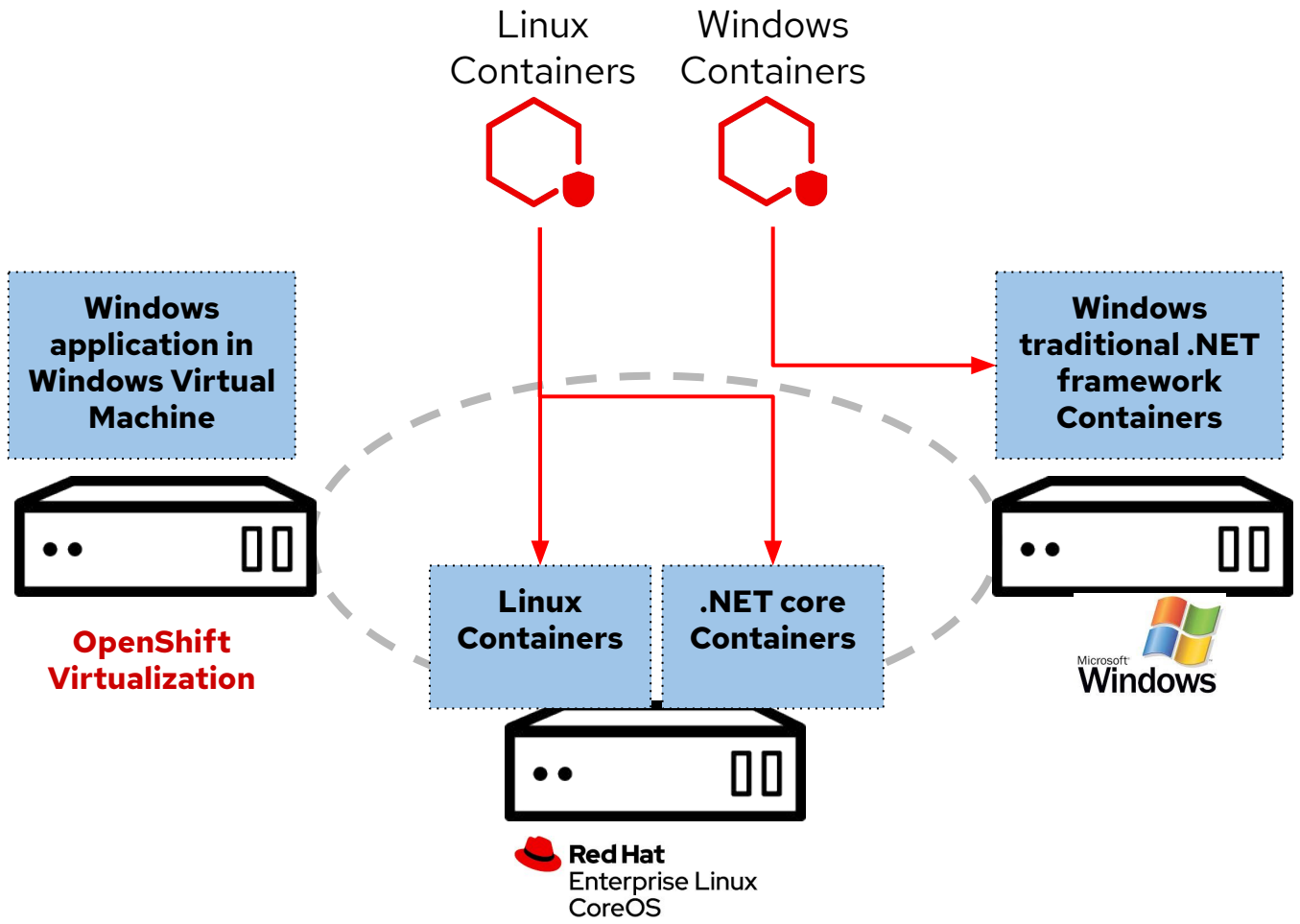
https://openshift-kni.github.io/baremetal-deploy

PM: Ramon Acedo Rodriguez

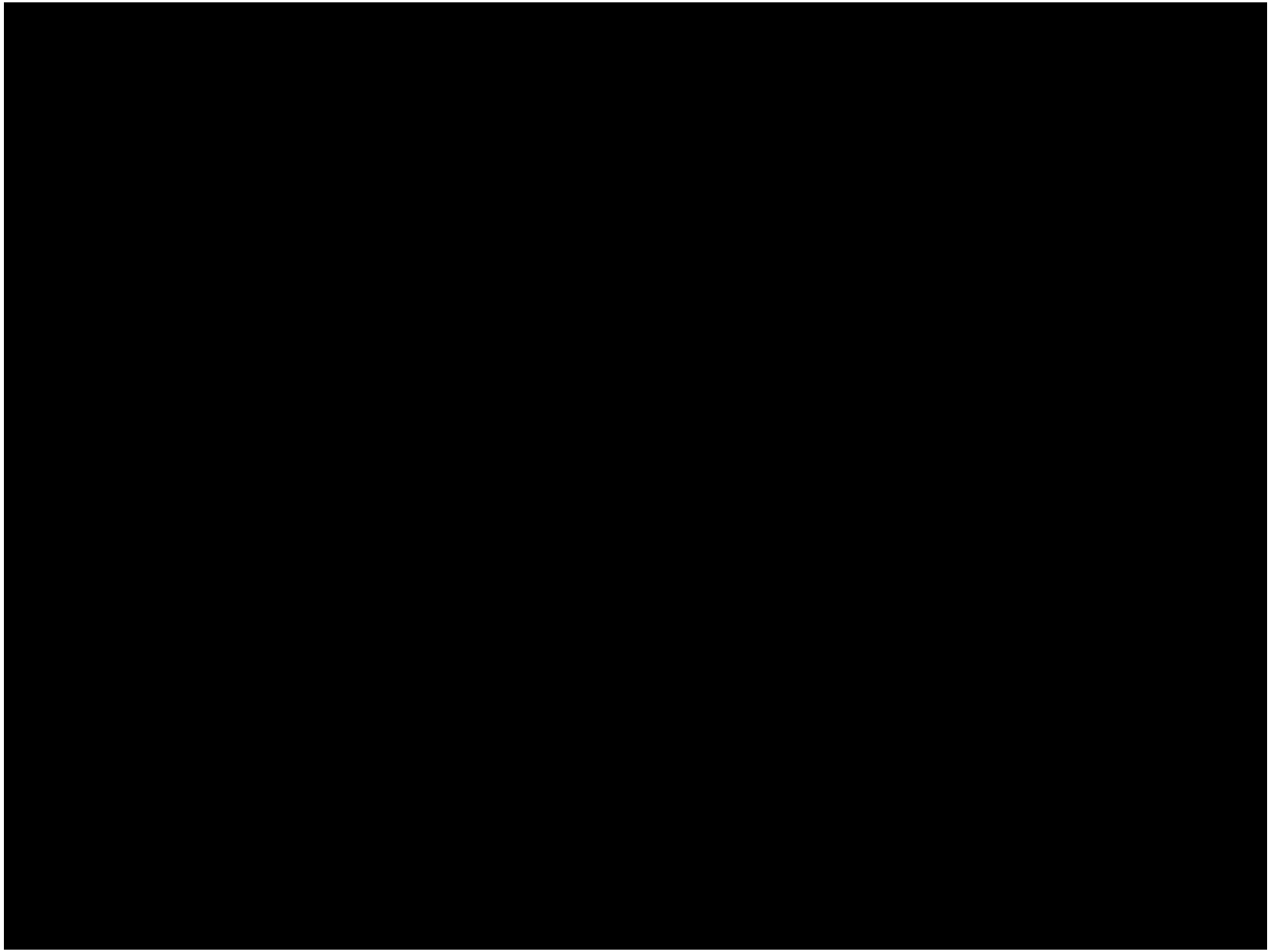
Windows Containers



Mixed Windows and Linux Workloads



- Run Linux containers on RHEL
- Run .NET core containers on RHEL
- Run traditional **.NET framework containers on Windows**
- Run **Windows VMs with CNV** (Container Native Virtualization)
- All scheduled and managed by OpenShift



Thank you

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