



# OpenShift 4.0

**Ali Mobrem**

Product Management

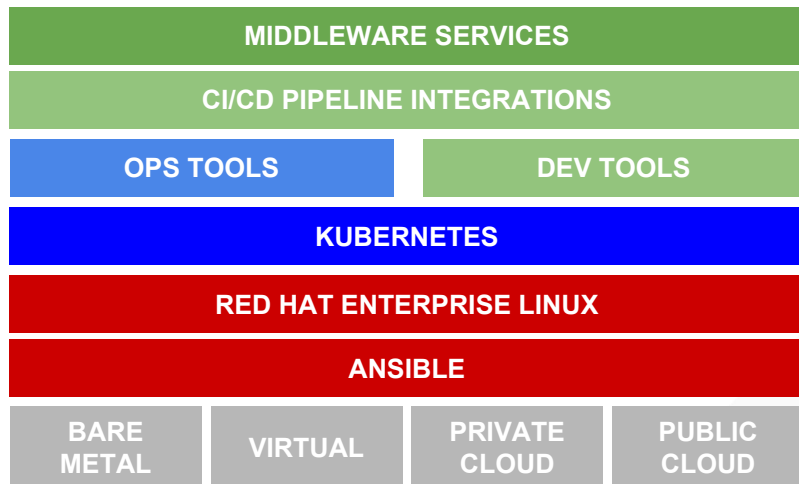
OpenShift

OpenShift Commons Briefing

# ROADMAP: OPENSSHIFT and CoreOS TECTONIC

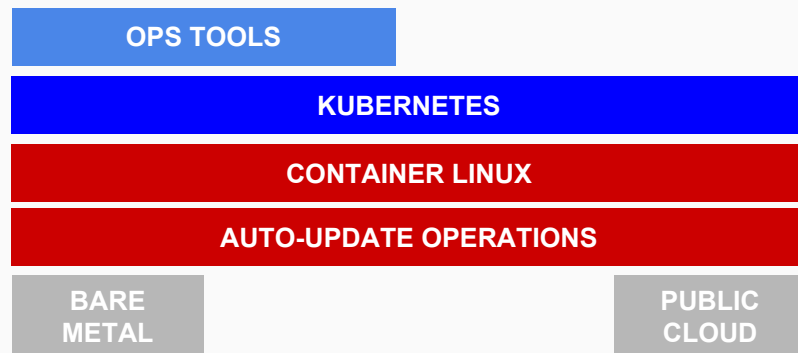
EVOLVING TO THE UNIFIED OPENSSHIFT PLATFORM (Version 4)

## RED HAT OPENSSHIFT



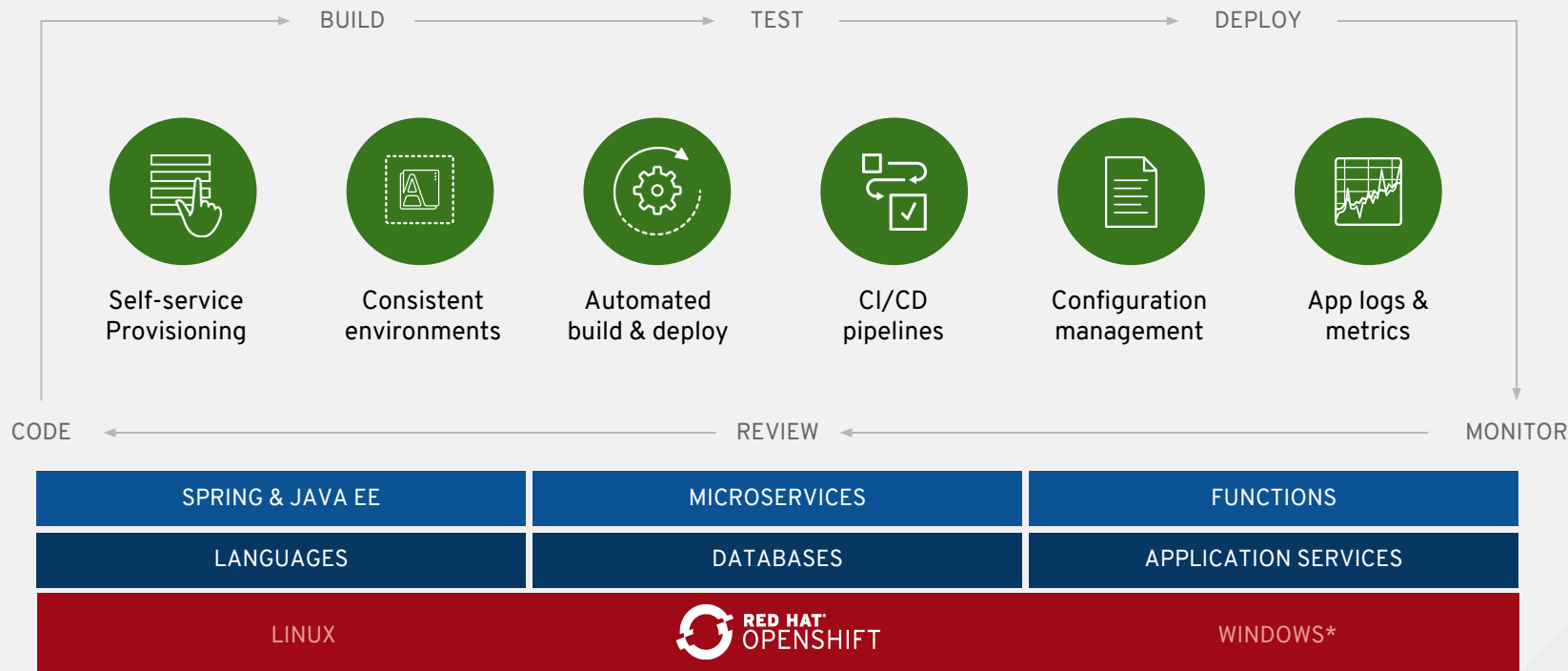
- DEEP KUBERNETES EXPERTISE
- MULTI-CLOUD DEPLOYMENTS
- INTEGRATED RED HAT TECH (RHEL, ANSIBLE, CF)
- MORE DEVELOPER FOCUS
- ENTERPRISE SECURITY FOCUS

## CoreOS TECTONIC



- DEEP KUBERNETES EXPERTISE
- PRIMARILY PUBLIC CLOUD DEPLOYMENTS
- FOCUS ON AUTOMATED OPERATIONS
- MORE OPERATOR FOCUS

# HOW OPENSIFT ENABLES DEVELOPER PRODUCTIVITY



\* coming soon

GENERAL DISTRIBUTION

# THE POWER OF THE **OPENSIFT** ECOSYSTEM

## RED HAT PORTFOLIO

Optimized for Containers

**RED HAT**  
**OPENSIFT**  
Application Runtimes

**RED HAT**  
**JBoss**  
WEB SERVER

**RED HAT**  
**JBoss**  
ENTERPRISE  
APPLICATION PLATFORM

**RED HAT**  
DATA GRID

**RED HAT**  
AMQ

**RED HAT**  
FUSE

**RED HAT**  
MOBILE

**RED HAT**  
ANSIBLE  
Engine

**RED HAT**  
QUAY  
CONTAINER  
REGISTRY

**RED HAT**  
DECISION  
MANAGER

**RED HAT**  
PROCESS AUTOMATION  
MANAGER

**RED HAT**  
3SCALE  
API MANAGEMENT

**RED HAT**  
OPENSIFT  
Container Storage

## THIRD-PARTY ISV

Red Hat Container Catalog (100s certified)

**IBM**

**Microsoft**

**SAP**

New Relic

Couchbase

CRUNCHY  
Enterprise PostgreSQL

Sysdig

f5

VERITAS

ZABBIX

NetApp

Sonatype

Jfrog

dynatrace

nuagenetworks

## CLOUD SERVICES

Open Service Broker

**amazon**  
web services

Microsoft Azure



Google Cloud



## RED HAT ENTERPRISE LINUX ECOSYSTEM

Hardware, Virtualization, Cloud and Service Provider Certifications

# OpenShift Roadmap

## OpenShift Container Platform 4.1 (May/June)

- Kubernetes 1.13
- Installer UPI: vSphere, Bare Metal, AWS
- Disconnected Installer
- OVN Tech Preview
- Operator ISV Eco-System
- Metering and ChargeBack GA
- Knative Tech Preview

## **OpenShift Online, Dedicated, and Azure**

- Consumption-based billing for Dedicated
- OpenShift Online Pro Upgrade to 4.X

Q2 CY2019

## OpenShift Container Platform 4.3 (Dec/Jan)

- Kubernetes 1.15
- Installer IPI: Alibaba; UPI: RH OSP, Azure, GCP
- OVN GA
- Hosted Operator Hub (Dev Preview)
- Windows Container Tech Preview)
- Knative GA

## **OpenShift Online, Dedicated, and Azure**

- OpenShift on Azure upgrade to 4.X
- OpenShift Online included in UHC

Q3 CY2019

Q2 CY2019

## OpenShift Container Platform 4.0 (April)

- Kubernetes 1.12 and CRI-O default
- Full Stack Automated Installer for AWS
- Red Hat CoreOS as immutable host
- Over-The-Air Updates
- RHCC integrated experience
- UHC Subscription Onboarding
- HPA custom metrics (Tech Preview)
- FIPS mode for golang (Dev preview)
- Multus (Kubernetes Multi-Network)
- OperatorHub
- Istio GA
- Metering and ChargeBack (Tech Preview)
- CodeReady Workspaces
- Knative (Dev Preview)

## **OpenShift Online, Dedicated, and Azure**

- OpenShift on Azure General Availability
- OpenShift Dedicated self-service in UHC

Q4 CY2019

## OpenShift Container Platform 4.2 (Aug/Sept)

- Kubernetes 1.14
- Installer IPI: RH OSP, Azure, GCP, Bare Metal (on RHII)
- OVN GA
- Windows Container Tech Preview)
- Knative Tech Preview

## **OpenShift Online, Dedicated, and Azure**

- OpenShift on Azure upgrade to 4.X
- OpenShift Online included in UHC

\*These are only target dates.





# try.openshift.com

Sneak Peak Developer Preview on AWS

Feedback welcome

# OPENSIFT 2019 THEMES

## UNIFIED HYBRID CLOUD



Multi-cluster awareness across on-premise and public-cloud OpenShift clusters via SaaS portal

## DAY-2 OPERATIONS



Automated operations and deep insights into the cluster via centralized logging, monitoring, chargeback, autoscaling, machine automations, operator framework components and applications

## OperatorHub



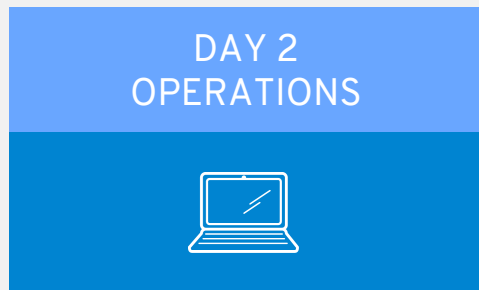
Active ecosystem of Operator-enabled partners, ISVs and community products

## MGT FOR OPENSIFT

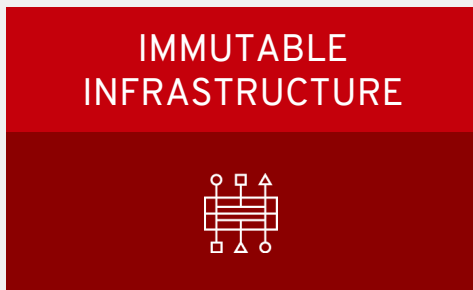


Self-Service Portal, Analytics, Ansible Automation and Cost Management

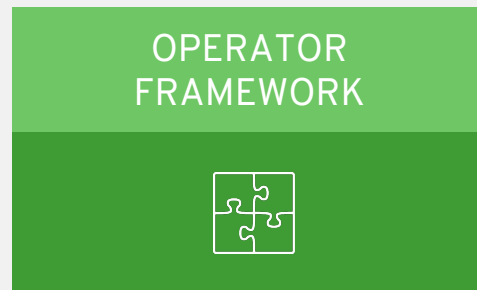
# OPENSIFT 4.0 WORKSTREAMS



**AWS Installer + bootstrapping**  
**Autoscale out of the box**  
**MachineSet node pools**



**RHEL CoreOS**  
**Discourage SSH/node mutation**  
**Ignition for Machine config**



**SDK & testing tools**  
**OperatorHub for discovery**  
**OLM delivers upper stack services**

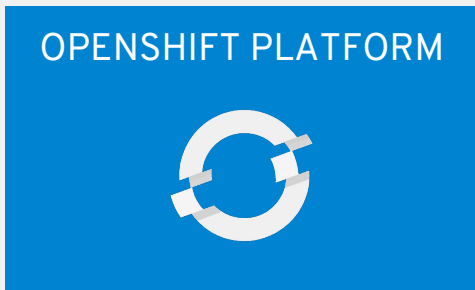
# AUTOMATED CONTAINER OPERATIONS

Fully automated day-1 and day-2 operations

| INSTALL              | DEPLOY                | HARDEN               | OPERATE                    |
|----------------------|-----------------------|----------------------|----------------------------|
| AUTOMATED OPERATIONS |                       |                      |                            |
| Infra provisioning   | Full-stack deployment | Secure defaults      | Multi-cluster aware        |
| Embedded OS          | On-premises and cloud | Network isolation    | Monitoring and alerts      |
|                      | Unified experience    | Audit and logs       | Full-stack patch & upgrade |
|                      |                       | Signing and policies | Zero downtime upgrades     |
|                      |                       |                      | Vulnerability scanning     |

# IMMUTABLE INFRASTRUCTURE

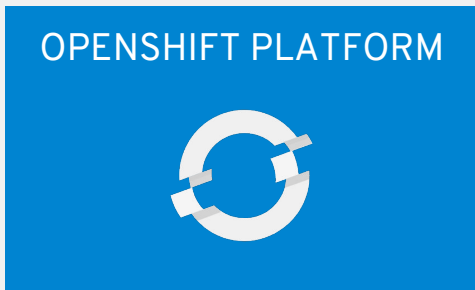
## OPENSIFT 3



- Manually provision RHEL, bring to cluster
- Rely on admin to correctly configure OS
- Configuration drift over time
- Upgrades control the platform and limited parts of the node

# IMMUTABLE INFRASTRUCTURE

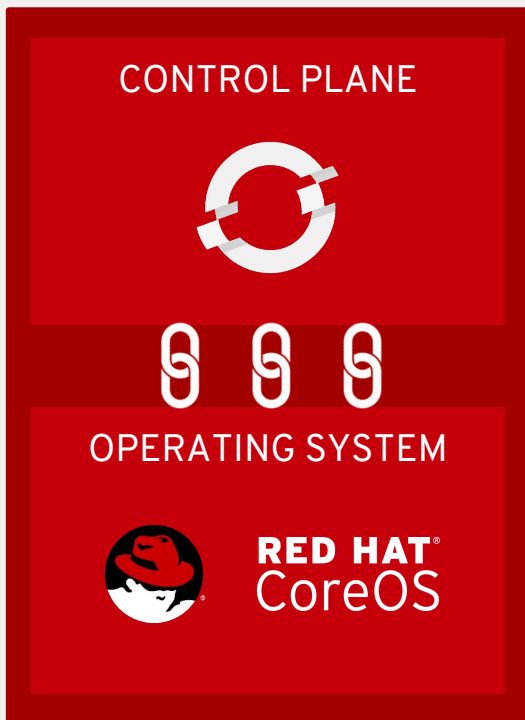
## OPENSIFT 3



## OPENSIFT 4

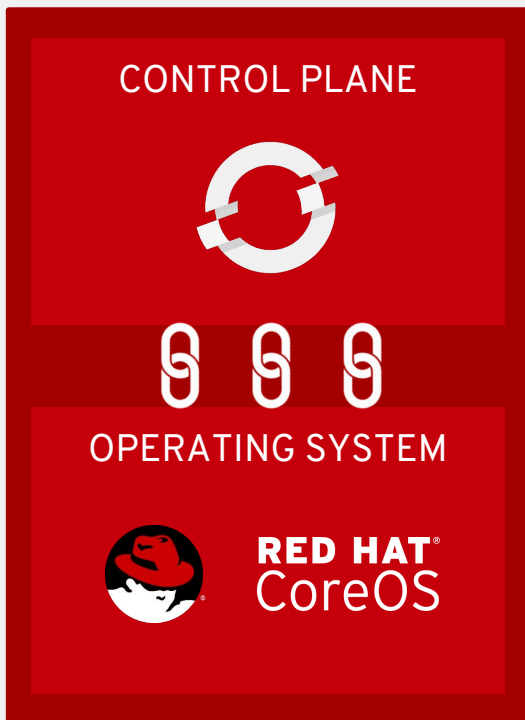


# IMMUTABLE INFRASTRUCTURE



For Day 2 management, the cluster needs full control over the nodes.

# IMMUTABLE INFRASTRUCTURE

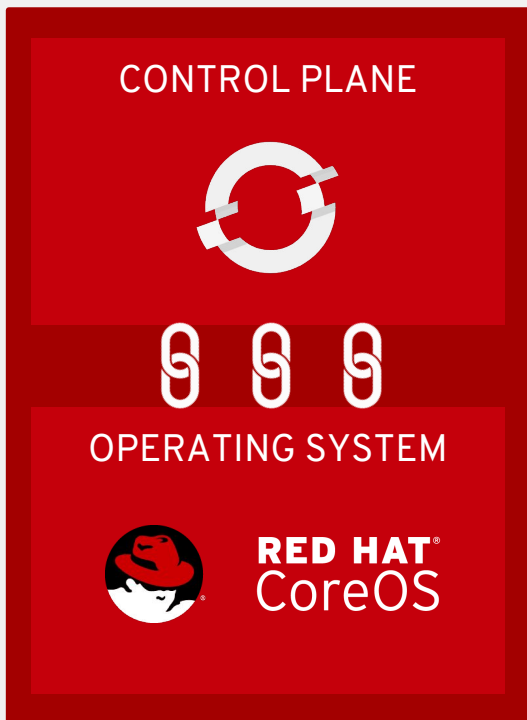


For Day 2 management, the cluster needs full control over the nodes.

Immutability  $\equiv$  repeatability

Immutability  $\equiv$  auditability

# IMMUTABLE INFRASTRUCTURE



For Day 2 management, the cluster needs full control over the nodes.

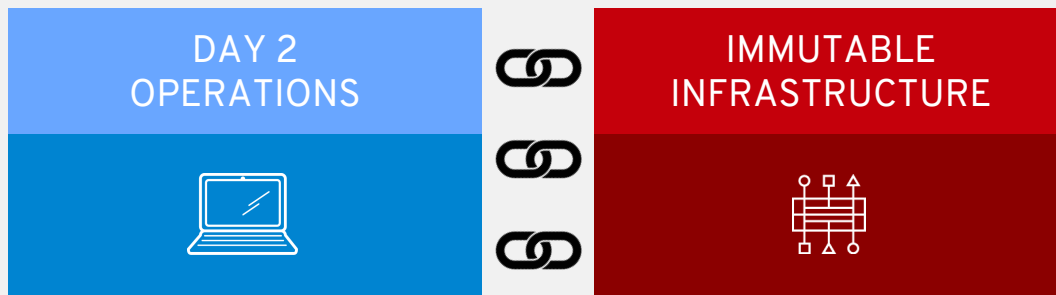
Immutability  $\equiv$  repeatability

Immutability  $\equiv$  auditability

Immutability  $\neq$  static clusters

Immutability  $\neq$  no config changes

# OPENSSHIFT 4.0 THEMES



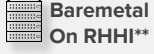
# INFRASTRUCTURE PROVISIONING

|                                      | OpenShift 3    | OpenShift 4    |
|--------------------------------------|----------------|----------------|
| User Provisioned Infrastructure      | <b>Default</b> | Optional       |
| Installer Provisioned Infrastructure | not possible   | <b>Default</b> |

# Provider Roadmap for OpenShift 4

## Installer Provisioned Infrastructure (IPI)

## User Provisioned Infrastructure (UPI)

|                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>OPENSHIFT<sup>™</sup></b><br>by Red Hat <sup>®</sup><br><b>4.0</b> |                                                                                                                                                                                                                                                           | —                                                                                                                                                                                                                                                                     |
|  <b>OPENSHIFT<sup>™</sup></b><br>by Red Hat <sup>®</sup><br><b>4.1</b> | —                                                                                                                                                                                                                                                                                                                                          |    Baremetal |
|  <b>OPENSHIFT<sup>™</sup></b><br>by Red Hat <sup>®</sup><br><b>4.2</b> |  <br>  | —                                                                                                                                                                                                                                                                     |
|  <b>OPENSHIFT<sup>™</sup></b><br>by Red Hat <sup>®</sup><br><b>4.3</b> | <br>Alibaba Cloud                                                                                                                                                                                                                                         |              |

**\*\* On qualified hardware stack**



# New Installation Process

via openshift-install

- OpenShift 4 introduces a new CLI-based installer designed to easily provision of a “best practices” OpenShift cluster on RH CoreOS immutable infrastructure
  - Control plane must be deployed on RH CoreOS nodes
  - Support for adding RHEL infra/worker nodes coming in 4.1
- Simplified cluster creation with an interactive guided workflow
  - Allows for customization at each step
  - <https://github.com/openshift/installer/blob/master/docs/user/customization.md>
- Quickly download installer client (& token) from <https://cloud.openshift.com> and run from anywhere
- Non-essential installation config options are now handled post-install via component operator CRD's
- Used new installations of OpenShift 4 only!
  - *Does NOT support installing or upgrading of OCP 3.x clusters!*

openshift-install is downloadable from <https://cloud.openshift.com/>!

```
$ ./openshift-install create cluster
? SSH Public Key /Users/<userid>/.ssh/id_rsa.pub
? Platform aws
? Region us-west-2
? Base Domain openshift.com
? Cluster Name ocp
? Pull Secret [? for help]
*****
INFO Creating cluster...
INFO Waiting up to 30m0s for the Kubernetes API...
INFO API v1.11.0+c69f926354 up
INFO Waiting up to 30m0s for the bootstrap-complete event...
INFO Destroying the bootstrap resources...
INFO Waiting up to 10m0s for the openshift-console route to be created...
INFO Install complete!
INFO Run 'export KUBECONFIG=<your working directory>/auth/kubeconfig' to manage the cluster with 'oc', the OpenShift CLI.
INFO The cluster is ready when 'oc login -u kubeadmin -p <provided>' succeeds (wait a few minutes).
INFO Access the OpenShift web-console here:
https://console-openshift-console.apps.ocp.openshift.com
INFO Login to the console with user: kubeadmin, password: <provided>
```

Documentation: <https://github.com/openshift/training/>

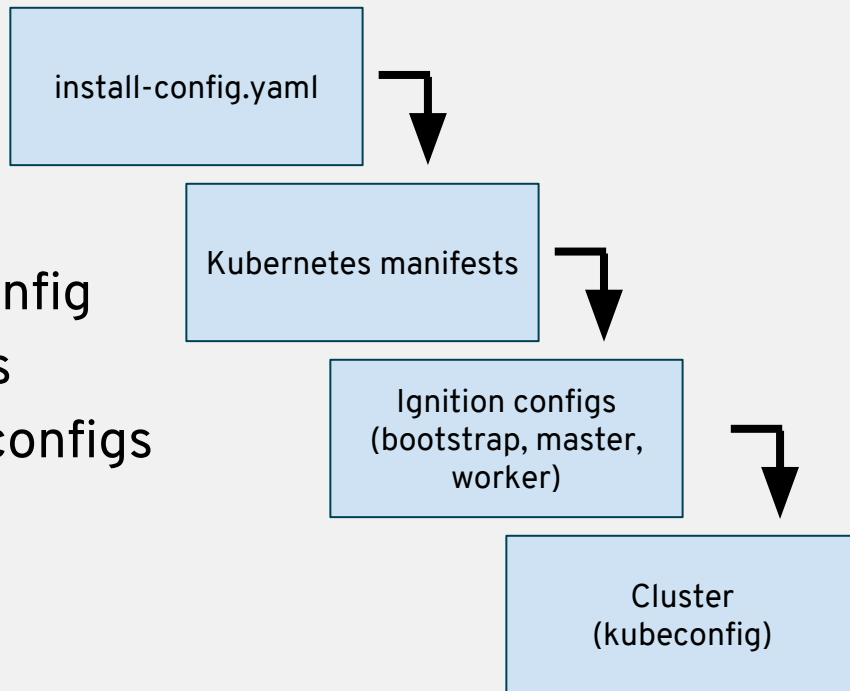
# NEW INSTALL EXPERIENCE

## (IPI) BOOTSTRAP A SELF-MANAGED CLUSTER



Download at [try.openshift.com](https://try.openshift.com)

```
$ openshift-install --help
$ openshift-install create install-config
$ openshift-install create manifests
$ openshift-install create ignition-configs
$ openshift-install create cluster
$ openshift-install destroy cluster
```



# Unified Hybrid Cloud

- Manage clusters across all infrastructure - On-prem or across cloud providers
- Deploy true hybrid services - behave like a cloud with full portability
- Pay based on consumption - with option to separate cloud bill
- Optionally choose fully managed (dedicated)

Register and provision cluster

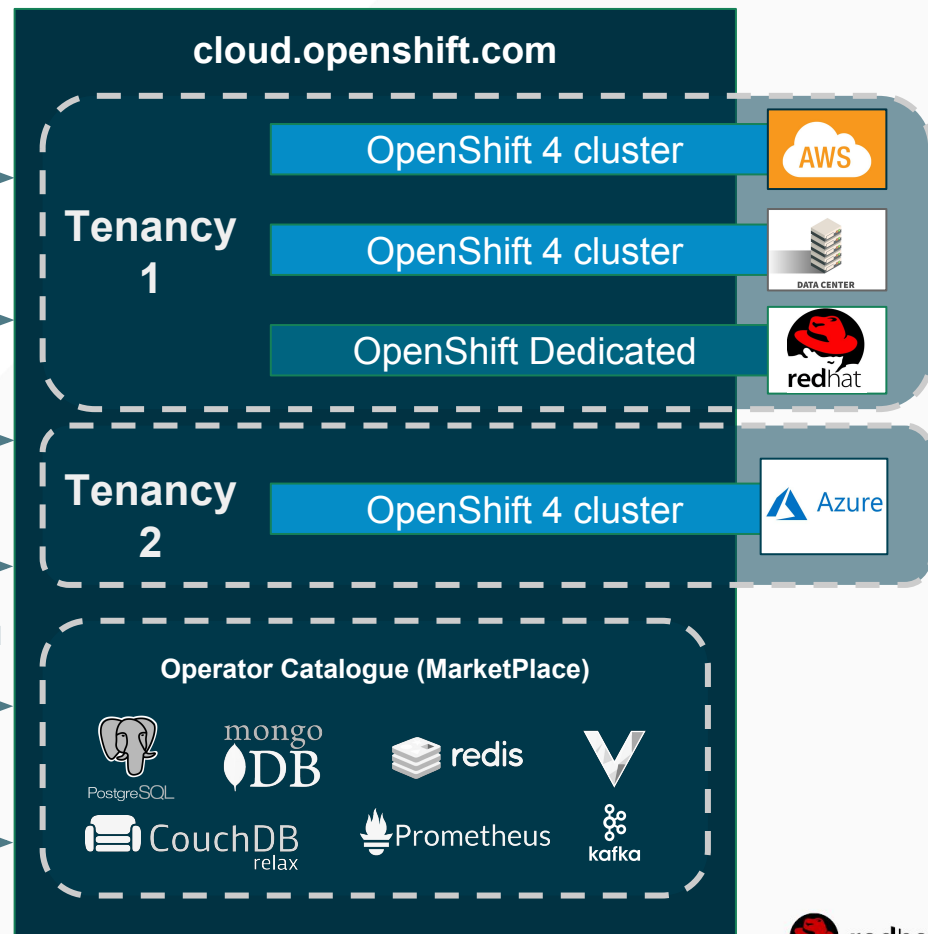
Manage multiple clusters

View clusters across clouds

Scale clusters

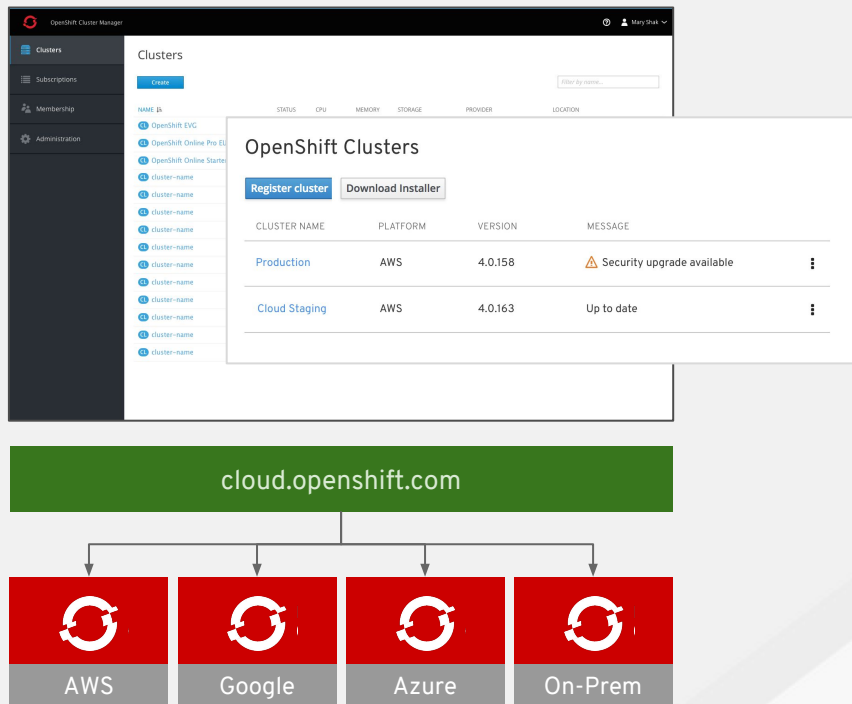
Consumption based billing

Deploy and manage K8s apps



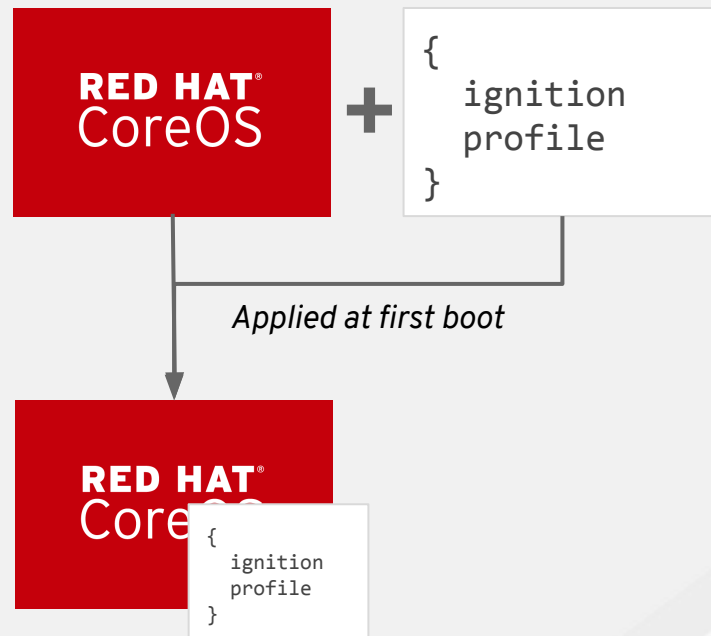
# UNIFIED HYBRID CLOUD INSTALLER

- Cloud-based multi-cluster management
  - New clusters on AWS, OCP, OSP, Azure and bare-metal
  - View existing clusters
  - Including OpenShift Dedicated
- Management operations
  - Install new clusters
  - View all registered clusters
  - Update clusters



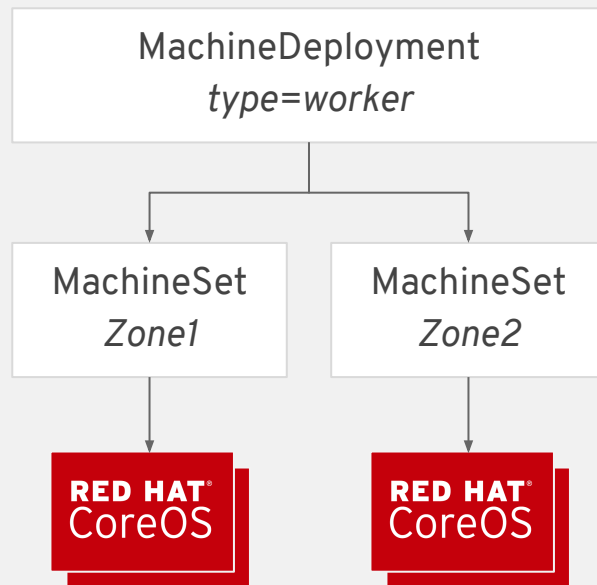
# MACHINE CONFIGURATION

- Red Hat CoreOS uses Ignition for configuration
- Ignition only runs once, on the first boot
- Ignition runs before systemd starts
  - Configure networking
  - Provision disks/RAID



# CLUSTER API OBJECTS

- New API objects to declaratively manage the cluster
  - MachineDeployment
  - MachineSet
  - Machine



# CLUSTER API - MACHINES



☰

Persistent Volumes

Persistent Volume Claims

Storage Classes

Builds

Build Configs

Builds

Image Streams

Monitoring

Alerts

Silences

Metrics

Dashboards

Machines

Machines

Machine Sets

Machine Deployments

You are logged in as a temporary administrative user.

Project: all projects

Machines

Create Machine

Filter Machines by name...

| NAME ↑                                      | NAMESPACE             | REGION    | AVAILABILITY ZONE |
|---------------------------------------------|-----------------------|-----------|-------------------|
| ci-ln-v0kim12-703b0-master-0                | openshift-machine-api | us-east-1 | us-east-1a        |
| ci-ln-v0kim12-703b0-master-1                | openshift-machine-api | us-east-1 | us-east-1b        |
| ci-ln-v0kim12-703b0-master-2                | openshift-machine-api | us-east-1 | us-east-1c        |
| ci-ln-v0kim12-703b0-worker-us-east-1a-bhrlb | openshift-machine-api | us-east-1 | us-east-1a        |
| ci-ln-v0kim12-703b0-worker-us-east-1b-6nnzp | openshift-machine-api | us-east-1 | us-east-1b        |
| ci-ln-v0kim12-703b0-worker-us-east-1c-sxfxg | openshift-machine-api | us-east-1 | us-east-1c        |

# CLUSTER API - MACHINE SETS

 RED HAT  
OPENSHIFT

Persistent Volumes

Persistent Volume Claims

Storage Classes

Builds

Build Configs

Builds

Image Streams

Monitoring

Alerts

Silences

Metrics

Dashboards

Machines

Machines

**Machine Sets**

Machine Deployments

You are logged in as a temporary administrative user.

Project: all projects

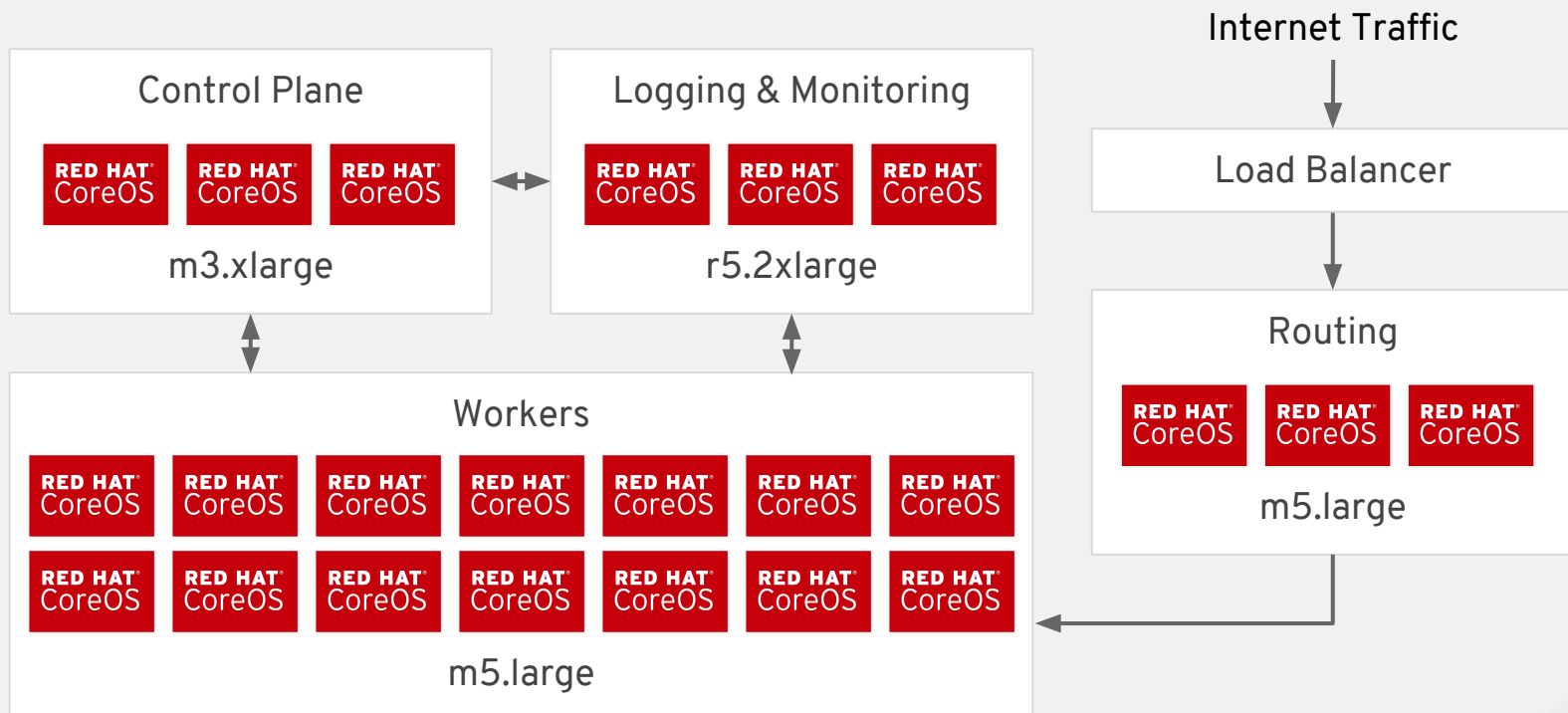
Add

Create Machine Set

Filter Machine Sets by name...

| NAME                                     | NAMESPACE                | MACHINES        |
|------------------------------------------|--------------------------|-----------------|
| MS ci-ln-v0kim12-703b0-worker-us-east-1a | NS openshift-machine-api | 1 of 1 machines |
| MS ci-ln-v0kim12-703b0-worker-us-east-1b | NS openshift-machine-api | 1 of 1 machines |
| MS ci-ln-v0kim12-703b0-worker-us-east-1c | NS openshift-machine-api | 1 of 1 machines |
| MS ci-ln-v0kim12-703b0-worker-us-east-1d | NS openshift-machine-api | 0 of 0 machines |
| MS ci-ln-v0kim12-703b0-worker-us-east-1e | NS openshift-machine-api | 0 of 0 machines |
| MS ci-ln-v0kim12-703b0-worker-us-east-1f | NS openshift-machine-api | 0 of 0 machines |

# POSSIBLE CLUSTER ARCHITECTURE



# CLUSTER ARCHITECTURE

- Scale Deployments independently
- Desired state managed by cluster
- Autoscale is no effort at all
- Rolling Machine config updates

Special GPU       = MachineDeployment  
Special security   = MachineDeployment  
Special \$anything = MachineDeployment

Control Plane



MachineDeployment  
*type=worker*

MachineDeployment  
*type=log-mon*

MachineDeployment  
*type=router*

# Over-the-air Updates

The screenshot shows the Red Hat OpenShift Cluster Settings page. The left sidebar contains navigation links: Home, Catalog, Workloads, Networking, Storage, Builds, Monitoring, Administration (expanded), Cluster Settings (selected), Namespaces, Nodes, Machine Deployments, Machine Sets, Machines, Service Accounts, Roles, Role Bindings, Resource Quotas, Limit Ranges, and CRDs. The main content area is titled 'Cluster Settings' and has tabs for Overview, Global Configuration, and Cluster Operators. A message states: 'Cluster updates are not supported in beta 1.' Below this is a table with columns: CHANNEL, UPDATE STATUS, and DESIRED VERSION. The table shows a single row with 'fast' as the channel, '-' as the update status, and '4.0.0-0.1' as the desired version. Below the table, the 'CLUSTER ID' is '7691a2f6-90a7-4822-be8d-1f9fdda492d3'. The 'DESIRED PAYLOAD' is 'quay.io/openshift-release-dev/ocp-release@sha256:56cee7428ba0d3cb983bd2a437e576b2289e7fd5abafa70256200a5408b266'. The 'CLUSTER AUTOSCALER' section has a link to 'Create Autoscaler'. The 'Update History' section shows a table with columns: VERSION, STATE, STARTED, COMPLETED, and PAYLOAD. The table shows a single row with '4.0.0-0.1' as the version, 'Completed' as the state, 'Jan 16, 7:12 pm' as the start time, 'Jan 16, 7:23 pm' as the completion time, and 'quay.io/openshift-release-dev/ocp-release@sha256:56cee7428ba0d3cb983bd2a437e576b2289e7fd5abafa70256200a5408b266' as the payload. An 'Update Channel' dialog box is open, showing a dropdown menu with options: 'fast' (selected), 'fast', 'nightly', and 'production'. The dialog has 'Cancel' and 'Update' buttons.

- “Over-the-air” updates can be performed from either OpenShift Cluster Console: “Administration→Cluster Settings” menu or Red Hat Cloud web interface at <https://cloud.openshift.com>
- Updates images are comprised of top level controller manifests, roles, and other resources necessary to update a cluster to a particular version
  - Bundled as a container image to avoid the need for a separate content delivery mechanism

# Cluster Settings

The screenshot displays the Red Hat OpenShift console interface. The left sidebar contains a navigation menu with the following items: Home, Projects, Status, Search, Events, Catalog, Workloads, Networking, Storage, Builds, Monitoring, Administration (expanded), Cluster Settings (selected), Namespaces, Nodes, Machine Deployments, and Machine Sets. The main content area is titled 'Cluster Settings' and includes a sub-header 'You are logged in as a temporary administrative user.' Below this, there are three tabs: Overview, Global Configuration (active), and Cluster Operators. The Global Configuration tab shows a list of configuration resources with the following details:

| CONFIGURATION RESOURCE         |                           |
|--------------------------------|---------------------------|
| <a href="#">Authentication</a> | <a href="#">Edit YAML</a> |
| <a href="#">DNS</a>            | <a href="#">Edit YAML</a> |
| <a href="#">Image</a>          | <a href="#">Edit YAML</a> |
| <a href="#">Infrastructure</a> | <a href="#">Edit YAML</a> |
| <a href="#">Ingress</a>        | <a href="#">Edit YAML</a> |
| <a href="#">OAuth</a>          | <a href="#">Edit YAML</a> |

# Cluster Operators

The screenshot shows the Red Hat OpenShift console interface. The left sidebar contains navigation links: Home, Projects, Status, Search, Events, Catalog, Workloads, Networking, Storage, Builds, Monitoring, Administration (expanded), Cluster Settings (selected), Namespaces, Nodes, Machine Deployments, and Machine Sets. The main content area is titled 'Cluster Settings' and has tabs for Overview, Global Configuration, and Cluster Operators. A status bar at the top indicates 'You are logged in as a temporary administrative user.' and the user 'kube:admin' is shown. Below the tabs, there is a filter input 'Filter Cluster Operators by name...'. A summary bar shows 12 Available, 0 Updating, 0 Failing, and 0 Unknown operators, with a 'Select All Filters' button and a '12 Items' count. The main table lists the following operators:

| NAME ↑                                    | STATUS    | MESSAGE                                                       | VERSION                    |
|-------------------------------------------|-----------|---------------------------------------------------------------|----------------------------|
| cluster-autoscaler-operator               | Available | -                                                             | v4.0.0-0.139.0.0-dirty     |
| cluster-image-registry-operator           | Available | deployment has minimum availability                           | v4.0.0-0.136.0.0-dirty     |
| kube-controller-manager                   | Available | 3 of 3 nodes are at revision 2                                | Unknown                    |
| machine-api-operator                      | Available | cluster-api ready                                             | v4.0.0-0.139.0.0-dirty     |
| machine-config-operator                   | Available | -                                                             | 4.0.0-0.139.0.0-dirty      |
| openshift-apiserver                       | Available | -                                                             | Unknown                    |
| openshift-cluster-kube-scheduler-operator | Available | 3 of 3 nodes are at revision 1                                | Unknown                    |
| openshift-cluster-samples-operator        | Available | Samples installation successful at v4.0.0-0.139.0.0-17aa1e7fd | v4.0.0-0.139.0.0-17aa1e7fd |

# DAY 2 OPERATIONS



Machine Operators



Cluster Operators



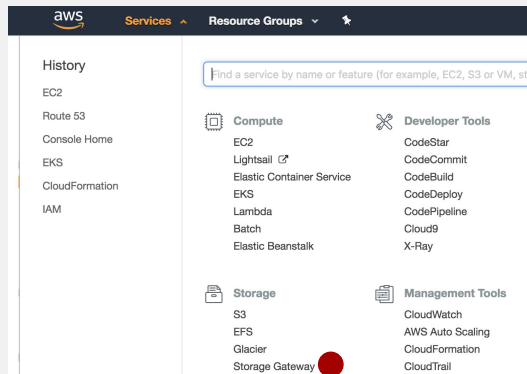
Update Operators

# Operators = Automated like the cloud

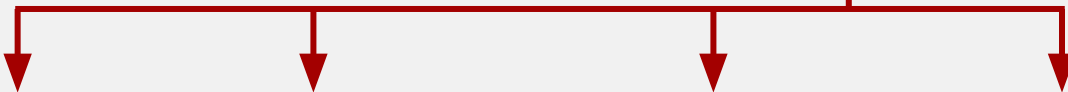
Your app...



automated like the cloud...



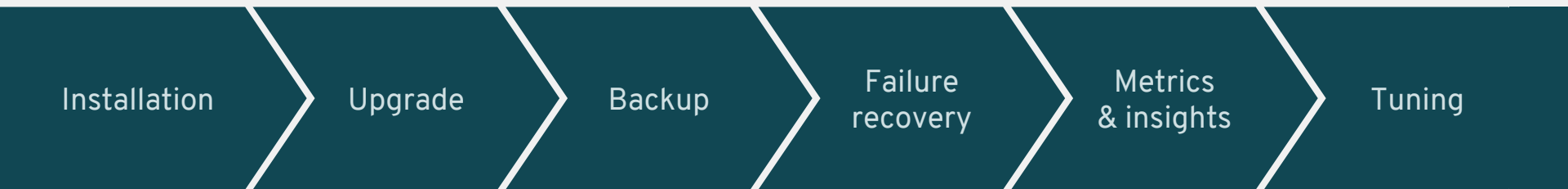
but runs on...



# KUBERNETES OPERATOR FRAMEWORK

AN INNOVATIVE, MORE EFFICIENT WAY TO MANAGE CONTAINERIZED APPLICATIONS AT SCALE

## AUTOMATED LIFECYCLE MANAGEMENT



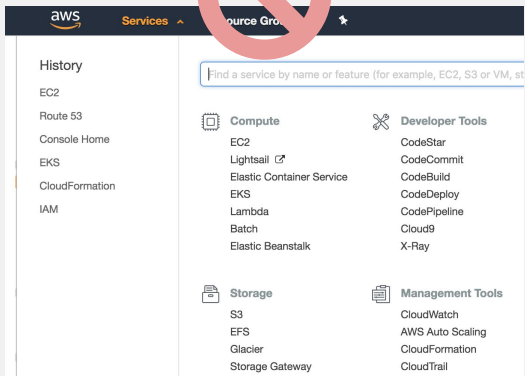
Operators codify operational knowledge and workflows to automate lifecycle management of containerized applications with Kubernetes

# Operators = Native Kubernetes experience

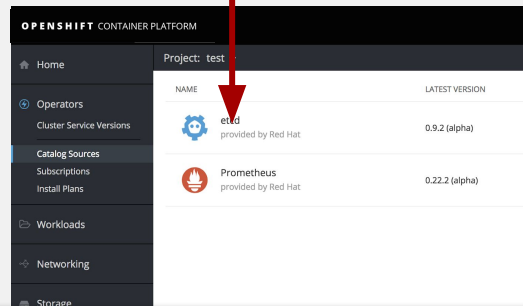
Your app...



Can't register your internal service with Amazon

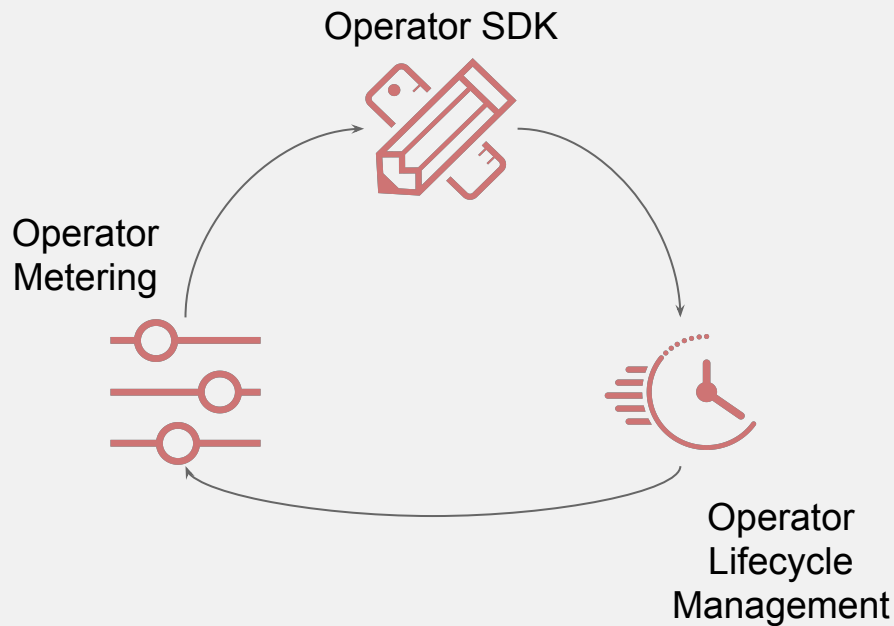


Can have native support in OpenShift, including the CLI



```
$ oc get mongodbs
$ oc scale --replicas=3 mongodb/example
```

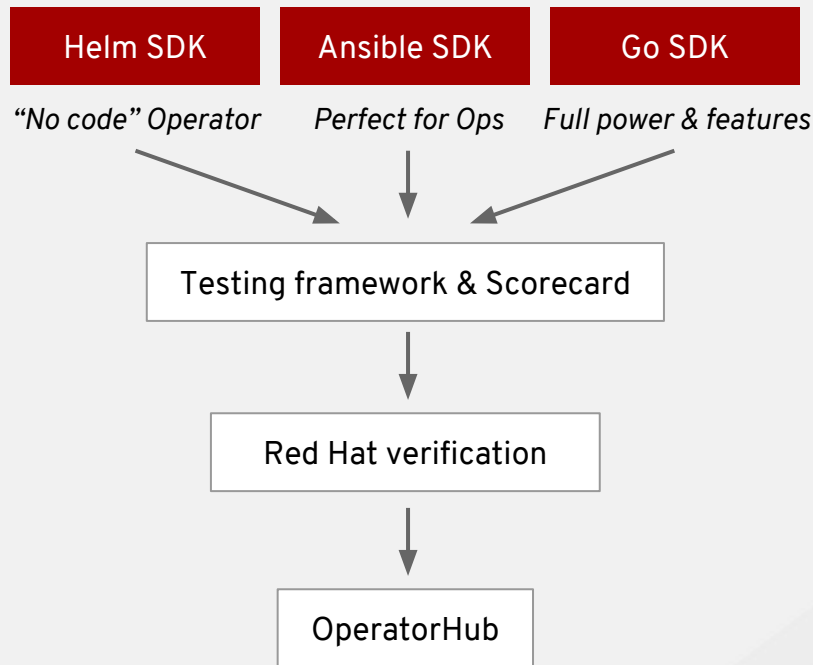
# OPERATOR FRAMEWORK



Operator Framework is an open source toolkit to manage application instances on Kubernetes in an effective, automated and scalable way.

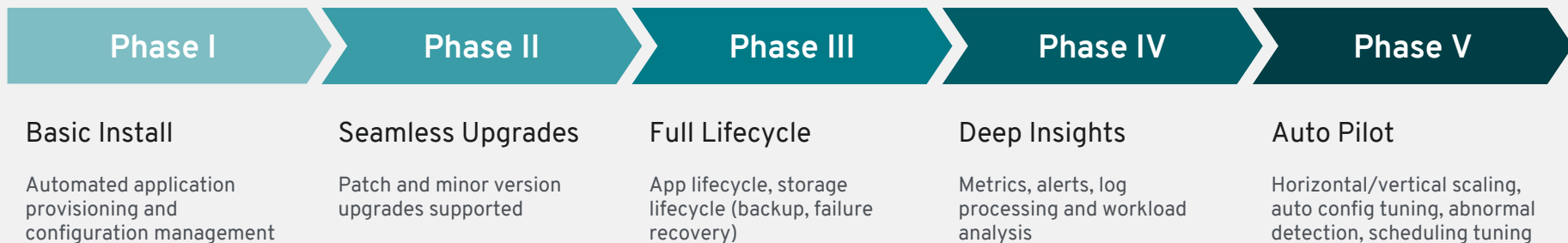
# OPERATOR SDK

- “No code” improvements to Helm SDK user experience
  - `operator-sdk new memcached-operator --type=helm --helm-chart=stable/memcached`
- Testing is extremely important for Operators, now we have a testing framework built in
- SDK includes a “scorecard” to ensure your Operator is technically correct
- Support new RHEL universal base image



# OPERATOR MATURITY MODEL

AVAILABLE NOW



ANSIBLE

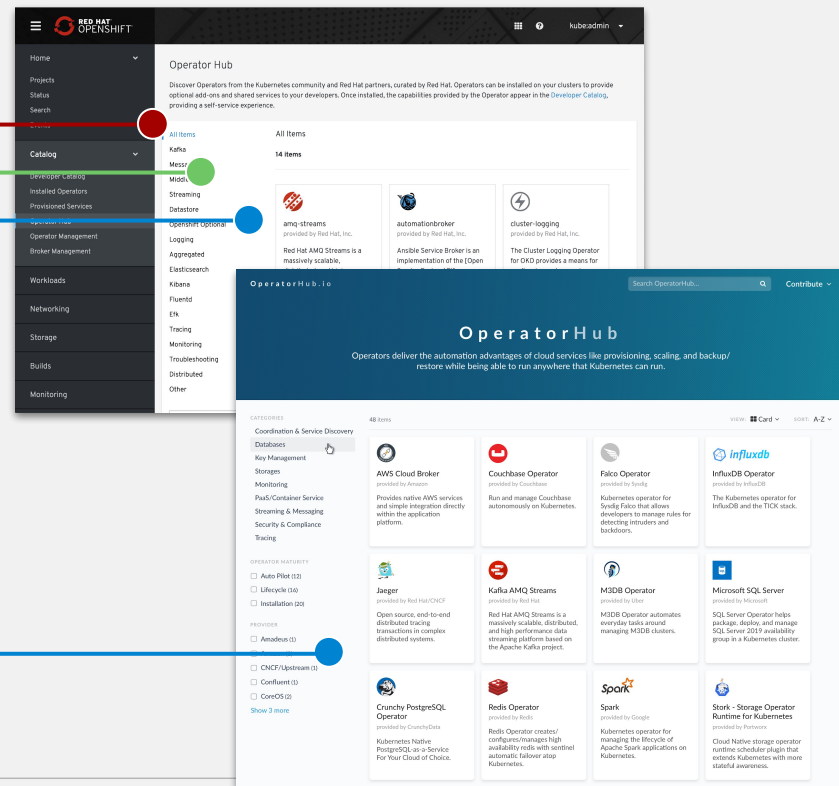


# OPERATORHUB

- Accessible to admins only
- Discovery/install of all optional components and apps
- Upstream and downstream content
- ISV partners will support their Operators

## TYPES OF OPERATORS

Red Hat Products  
ISV Partners  
Community



# Extending the Platform

A slimmer default install, with incremental feature buy-in

# BASE INSTALL

CONFIRMED FOR 4.0

|                           | NEW INSTALLER | OPERATORHUB |
|---------------------------|---------------|-------------|
| Console & Auth            | ●             | —           |
| Monitoring                | ●             | —           |
| Over-the-air Updates      | ●             | —           |
| Machine Management        | ●             | —           |
| Optional Service Brokers  | —             | ●           |
| Optional OCP Components   | —             | ●           |
| Red Hat Product Operators | —             | ●           |
| ISV/Partner Operators     | —             | ●           |
| Community Operators       | —             | ●           |

# Operator Powered UI Extensions

Native Experience

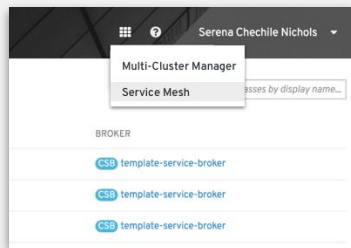
CNV

Native + External Links

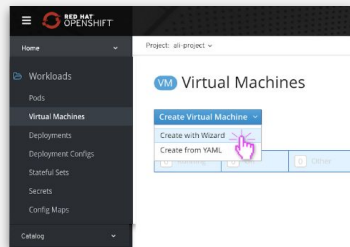
MONITORING

External Application Launcher

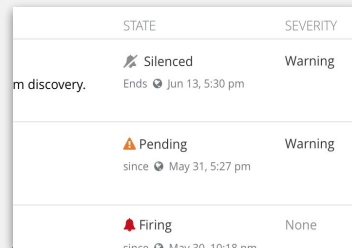
SERVICE MESH



OCP 4.1



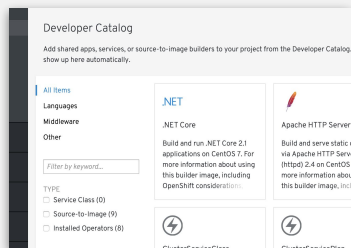
OCP 4.1



OCP 4.0

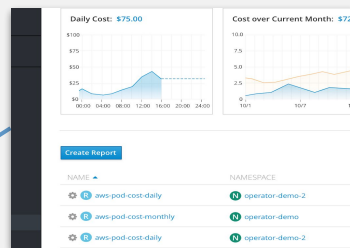
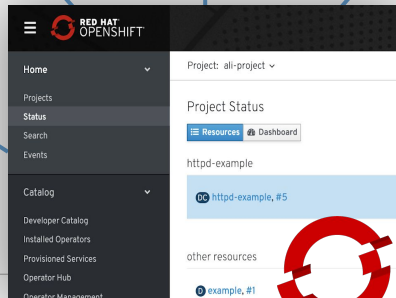
Dev. Catalog

OPERATOR &  
BROKER APPS



OCP 4.0

Core Platform



OCP 4.1

Native Experience

METERING &  
CHARGEBACK

# DEVELOPER CATALOG

CONFIRMED FOR 4.0

- Entry point for a developer to access all services available to them
- Merges all capabilities from Operators, Service Catalog, Brokers, and S2I

The image shows the Red Hat OpenShift Developer Catalog interface and a 'Create Source-to-Image Application' dialog.

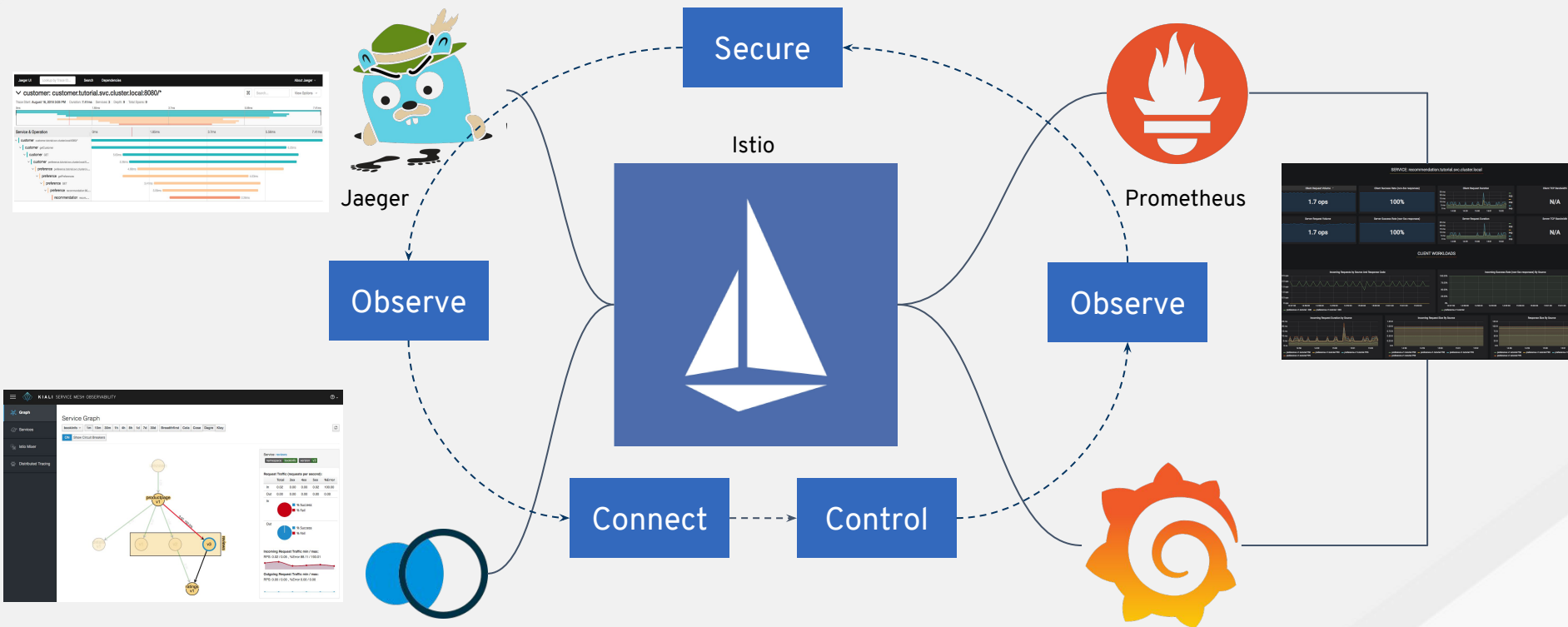
**Developer Catalog Interface:**

- Header:** Red Hat OpenShift logo and navigation menu (Home, Catalog, Developer Catalog, Installed Operators, Provisioned Services, Operator Hub, Operator Management, Broker Management, Workloads, Networking, Storage).
- Project:** kube-system
- Developer Catalog:** Add shared apps, services, or source-to-image builders to your project from the Developer Catalog. Cluster admins can show up here automatically.
- Filters:** All Items (17 items), Languages, Middleware, Other. A search bar labeled 'Filter by keyword...' is present.
- Item Cards:**
  - .NET Core:** Build and run .NET Core 2.1 applications on CentOS 7. For more information about using this builder image, including OpenShift considerations.
  - Apache HTTP Server (httpd):** Build and serve static content via Apache HTTP Server (httpd) 2.4 on CentOS 7. For more information about using this builder image, including OpenShift considerations.

**Create Source-to-Image Application Dialog:**

- Namespace:** kube-system (with a 'PR' icon).
- Version:** nginx:1.12 (with an 'IST' icon).
- Name:** (empty field). Description: Names the resources created for this application.
- Git Repository:** (empty field). Description: For private Git repositories, create a [source secret](#).
- Try Sample:** (link icon).
- Options:**
  - ☐ Create route: Exposes your application at a public URL.
- Buttons:** Create, Cancel.
- Preview:** Nginx HTTP server (NGINX BUILDER NGINX). Description: Build and serve static content via CentOS 7. For more information and considerations, see <https://github.com/containers/builder/blob/master/1.12/README.md>. Sample repository: <https://github.com/containers/builder/blob/master/1.12/README.md>.
- Resources:** The following resources will be created:
  - A **build config** to build source-to-image.
  - An **image stream** to track built images.
  - A **deployment config** to rollout new builds.
  - A **service** to expose your work.
  - An optional **route** to expose your application.

# SERVICE MESH



# CONTAINER-NATIVE VIRTUALIZATION

- [CNV 1.3 Tech Preview](#) (now)
- CNV 1.4 Tech Preview (soon)
  - Operators for KubeVirt, Containerized data importer

Project: all projects ▾

### Virtual Machines

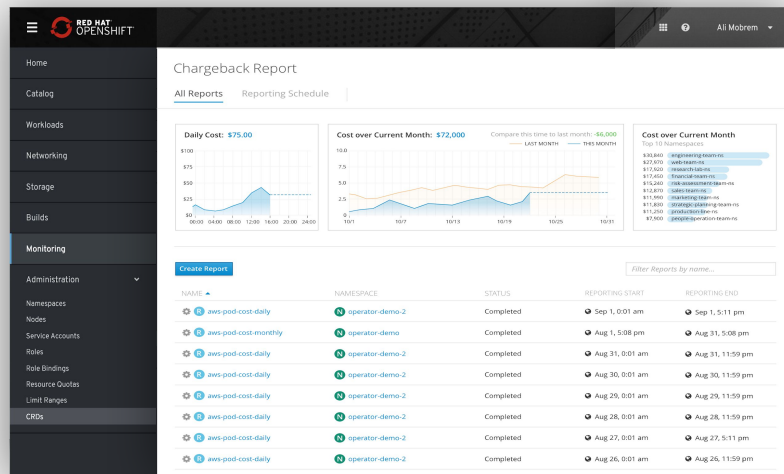
Create Virtual Machine ▾

2 Running 1 Off 0 Other Select All Filters

| NAME ↑        | NAMESPACE        | STATE   |
|---------------|------------------|---------|
| VM fedora-vm  | NS kubevirt-demo | Running |
| VM rhel-vm    | NS kubevirt-demo | Off     |
| VM windows-vm | NS kubevirt-demo | Running |

# METERING/CHARGEBACK

- Testing a developer preview now
  - Install from OperatorHub
- Base functionality on all providers
- Tie into cloud providers for \$\$
- Included reports for 80% use-case
  - Customers can write custom reports and time periods
- Popular use-case: same teams over requesting RAM



CPU  
Memory  
Storage

Request  
Actual Usage  
Utilization %

Pod  
Namespace  
Node  
Cluster

# Cluster Monitoring in 4.0

Provide a single, unified, and native experience for Cluster Admins to manage alerts and start troubleshooting.

The screenshot shows the OpenShift Container Platform Cluster Console interface. The left sidebar contains navigation links: Overview, Workloads, Networking, Troubleshooting, Search, Events, Monitoring Alerts (selected), and Administration. The main content area is titled 'Monitoring Alerts' and includes tabs for Alerts and Silences. Below the tabs, a summary bar shows 7 Firing, 1 Silenced, 2 Pending, and 36 Inactive alerts. A table lists the following alerts:

| NAME                                                                                                                        | STATE                            | SEVERITY |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------|
| AlertmanagerDownOrMissing<br>An unexpected number of Alertmanagers are scraped or Alertmanagers disappeared from discovery. | Silenced<br>Ends Jun 13, 5:30 pm | Warning  |
| APIServerErrorsHigh<br>API server returns errors for 100 of requests                                                        | Pending<br>since May 31, 5:27 pm | Warning  |
| DeadMansSwitch<br>This is a DeadMansSwitch meant to ensure that the entire Alerting pipeline is functional.                 | Firing<br>since May 30, 10:18 pm | None     |
| DeploymentReplicasNotUpdated<br>Replicas are not updated and available for deployment                                       | Firing<br>since May 30, 10:18 pm | Warning  |

Provide a streamlined experience to setup app monitoring with Prometheus for tenants through the Operator Hub.

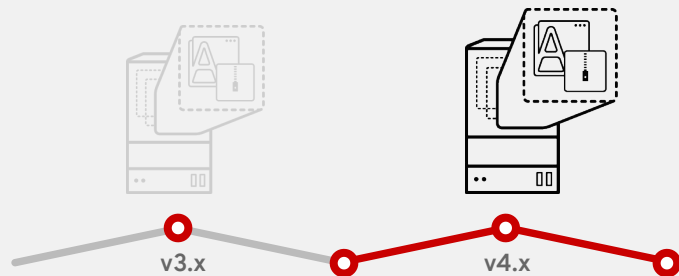
The screenshot shows the OKD Cluster Console interface for the 'marketing' project. The left sidebar contains navigation links: Home, Operators, Cluster Service Versions, Catalog Sources, Subscriptions, Install Plans, Workloads, Networking, Storage, and Builds. The main content area is titled 'Prometheus Operator 0.22.2 provided by Red Hat' and includes tabs for Overview and Instances. A 'Create New' dropdown menu is open, showing options: Prometheus, Prometheus Rule, Service Monitor, and Alertmanager. Below the menu, a table lists the installed instances:

| NAME    | LABELS           | TYPE           | STATUS  | VERSION |
|---------|------------------|----------------|---------|---------|
| example | prometheus-k8s   | Prometheus     | Unknown | v2.3.2  |
| example | k8s-app=frontend | ServiceMonitor | Unknown | Unknown |

# UPGRADE PLAN

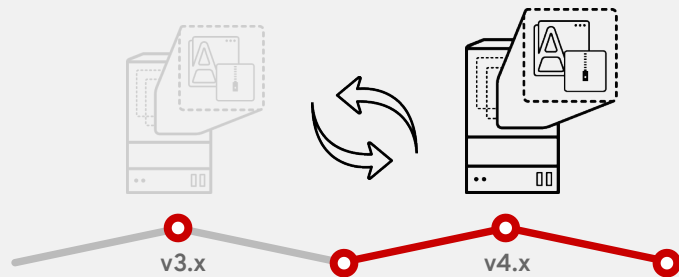
## Customer requirements

- 1 - Customer don't like serial upgrades
- 2 - Customer would like a recovery process and automation in the event of cluster-wide failure
- 3 - Customer would like to be able to migrate applications between clusters



# UPGRADE PLAN

## Migration targets



Focus on **migration utility** vs In-place upgrades

Utility will target:

- Cluster and project configuration
- Registry Content
- Application workloads

Goal is to migrate a cluster of OpenShift 3.x over to an OpenShift 4.x

Forecasting ability to demonstrate this by middle of the year\*



# THANK YOU

<http://openshift.com>