How Do You OpenShift?

Jared Burck
Architect
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Jared Burck
Architect
Red Hat

- Cloud application and migration specialist
- Container adoption and devops guru
- Build and release management expert
- Open source contributor and collaborator

oc whoami
What tools do you need to OpenShift?

- There are an endless options of tools available
- Your tools of choice varies with your
  - Preferences
  - Tasks
  - Roles
  - Operating systems
  - “View” of the world
- Do you have the permissions to install your tools of choice?
  - Do you have full control over your system or is it manage by an enterprise?
    - Some organizations are very opinionated and locked down
    - Others companies may allow some, or controlled/approved installations
    - While still other will give out full permissions to specific roles/users
> It’s Your World

The OpenShift Ways
OpenShifting Locally
Container Tools for Everyone
Development for All & Anywhere
From Operators to Extensions
Demo - How Do You OpenShift
Who are You?

Developers & Engineers
Administrators & Operators
Architects & Managers
Directors & Executives
What is your Primary OS?

Apple
macOS

Linux
Red Hat
Fedora

Other distros

Microsoft
Windows

#redhat #rhsummit
Where do you OpenShift?

- Baremetal
- Cloud Services
- Local Workstations
- On Premise
- Online
- Dedicated
- OpenShift
- Azure
- IBM Cloud
- Alibaba Cloud
- Amazon Web Services
- Microsoft Azure
- Google Cloud Platform
How do you OpenShift?

- Command Line Interface (CLI)
- Web Console (GUI)
- Application Program Interface (API)
Agenda

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> The OpenShift Ways

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oc: a CLI for OpenShift

The oc command line tool is used to interact with the OpenShift and Kubernetes HTTP API(s). oc is an alias for openshift cli and commands are verb focused.

There are 5 base verbs and 6 command groups can be used to manage both Kubernetes and OpenShift resources. Most common verbs and subcommands are documented in the CLI help.

oc is a first class tool that can help you interact with openshift regardless of your role!

> oc project <projectName> --display-name="<display_name>"
Now using project "rhsummit19" on server "https://192.168.42.101:8443".

> oc new-app --template=django-psql-persistent
Run 'oc status' to view your app.

> oc logs -f bc/django-psql-persistent
Push successful

> oc describe bc django-psql-persistent
Name:  django-psql-persistent
(additional output omitted)

> oc expose service django-psql-persistent
route.route.openshift.io/django-psql-persistent exposed

> oc start-build django-psql-persistent
build.build.openshift.io/django-psql-persistent-2 started

> oc status
View details with 'oc describe <resource>/<name>' or list everything with 'oc get all'
odo is a new CLI for OpenShift that is tailored for developer syntax and workflows.

Goal is to make it simple for a developer to create an app, add components (like a database) and expose it without needing to know Kubernetes.

odo is affectionately called “OpenShift DO!”

```bash
> odo create wildfly backend
Component ‘backend’ was created.
To push source code to the component run ‘odo push’

> odo push
Pushing changes to component: backend

> odo storage create backend-store --path /data --size 100M
Added storage backend-store to backend

> odo create php frontend
Component ‘frontend’ was created.
To push source code to the component run ‘odo push’

> odo push
Pushing changes to component: frontend

> odo url create

> odo watch
Waiting for something to change in /Users/redhat/odo/frontend
```
DevOps Console

- Application-centric views and tasks of Kubernetes, OpenShift + Operator-enabled addons
- Developer workflows
  - Import app
  - Web IDE (Eclipse Che)
- DevOps / SRE workflows
  - Pipelines
  - Environments
  - Third-party integrations
Cluster Settings Console

- Cluster-centric views and tasks of Kubernetes and OpenShift
- Admin / Ops workflows
  - Cluster settings
  - Machine info
  - CRDs
- DevOps / SRE workflows
  - Resource management
  - Capacity management
Agenda

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OpenShift 3.x (local)

Minishift

- Based on (community) OKD
- Centos or boot2docker based (ISO) VM image
- Utilizes community based images and imagestreams
- Supported on MacOS, Windows, and Linux
- Provisions a single-node OKD cluster using libmachine
- Compatible with a variety of hypervisors
- Uses `oc cluster up` behind the scenes

Where to download?
- GitHub releases

How do I get support?
- Open Source communities

Who should use this?
- All users and roles

What are the benefits?
- Deploy applications to local OKD
- Test new/updated processes and procedures
- Extend and validate new platform capabilities
- Good for persistent & long lived dev cycles
OpenShift 3.x (local)

Where to download?
- Red Hat Customer Portal
- Red Hat Developers

How do I get support?
- Open Source communities
- Red Hat Support (with proper entitlements)

Who should use this?
- All users and roles

What are the benefits?
- Deploy applications to local OCP
- Test new/updated processes & procedures
- Extend & validate new platform capabilities
- Good for persistent & long lived dev cycles

Container Development Kit (CDK)
- Enterprise version of Minishift
- Based on (enterprise) OpenShift Container Platform
- Red Hat Enterprise Linux based (ISO) VM image
- Utilizes Red Hat Enterprise Linux based images and imagestreams
- Utilizes free Red Hat Developer subscription
- Build Red Hat Enterprise Linux based container images
OpenShift 3.x (local)

$ oc cluster up

- Part of the oc (OpenShift Client) binary
- Only supported on Linux platform
- Calls docker on host where command is run to bootstrap a local OKD cluster
- First introduced in OpenShift Origin 1.3
- Best suited for creating quick, disposable environments that you don't plan on persisting
- Docker and oc binary only requirements

Where to download?
- GitHub releases
- Red Hat Customer Portal

How do I get support?
- Open Source communities
- Red Hat Support (with proper entitlements)

Who should use this?
- All users and roles

What are the benefits?
- Easy way to bootstrap a cluster based on a docker container
- Enables rapid prototyping and development
- Only requires docker and the oc client
OpenShift 3.x (local)

Other (build your own aka BYO)...

- Build your own virtual machines
  - KVM
  - Xhyve
  - Hyper-V
  - VirtualBox
  - Vagrant
  - others
- Build all-in-one node or multi-node clusters
- Can Utilize OpenShift installation methods
- Build OpenShift in one or more containers

Where to download?
- See particular vendor for specifics

How do I get support?
- Red Hat for any product support
- Project communities related to that project
- 3rd party vendor for their products support

Who should use this?
- Developers & Engineers
- Administrators & Operators

What are the benefits?
- Full installation control and options
- Configure high availability cluster
- Replicate prod configurations locally
- Create advanced & complex architectures
OpenShift 4.x (local)

Universal Installer

- One install script to rule them all
- Designed to help users create clusters in various environments
- Acts as an installation wizard, prompting for values as needed
- Provides facilities for varying levels of customization
- On supported platforms, capable of provisioning the underlying cluster infrastructure
- In alternate scenarios, users can provision their own infrastructure using the cluster assets generated by the installer

Where to download?
- GitHub releases
- Red Hat Customer Portal

How do I get support?
- Open Source communities
- Red Hat Support (with OCP entitlements)

Who should use this?
- All users and roles

What are the benefits?
- Deploy applications to local OpenShift 4
- Test new/updated processes & procedures
- Extend & validate new platform capabilities
- Replaces Minishift, CDK, and `oc cluster up` in OpenShift 3.x
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Container Tools

docker = skopeo + podman + buildah
Container Tools

**Podman**
- docker-compatible CLI for containers
- Specializes in commands & functions to help you manage OCI images
- Works with containers and pods
- Based on the Docker CLI
- No big fat daemon
- Image/container tagging
- Adv. namespace isolation

**Skopeo**
- Operate on container images & repositories
- Copying images to and from various storage mechanisms
- Inspecting remote images and repositories
- Deleting images from various repositories
- Pass authentication credentials & certificates

**Buildah**
- Secure & flexible OCI container builds
- Specializes in building OCI images
- Build containers without Dockerfile
- Works with various formats
- No big fat daemon
- Integrated into OCP build pods
Container Tools

Where to download?
- Linux package managers
- GitHub or build from source

How do I get support?
- Open Source communities
- Red Hat (with proper entitlements - e.g. RHEL)

Who should use this?
- All users and roles

What are the benefits?
- Daemonless container management
- Build OCI compliant containers and images
- Copy container and images to/from registries
- Run and orchestrate containers in production
Other Container Tools
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Workstation IDEs

- Deep insights into your code
- Developer ergonomics
- Built-in developer tools
- Polyglot experience

- Extensible tools & platform support
- Powerful editing, browsing, refactoring, & debugging
- Customize & extend platform to make it your own

- Download from JetBrains
- Supported by JetBrains & community
- Good for Developer & Engineers, Admins & Ops, and Architect & Managers

- Download from Eclipse or 3rd Party Vendor
- Supported by 3rd party and/or OSS communities
- Good for Developer & Engineers, Admins & Ops, and Architect & Managers
Laptop IDEs

- Lightweight & super fast to install
- Native support for Git
- Support for Emmet abbreviations
- Super-simple editor zoom
- Very keyboard-friendly

- Download from [VS Code (Microsoft)](https://code.visualstudio.com)
- Supported by VS Code Marketplace team
- Good for Developer & Engineers, Admins & Ops, and Architect & Managers

- Many other lightweight or niche specific IDEs
- Alternatively, many text editors can also be IDEs
- Familiarity with tools that have use cases beyond development
- Personal preference or lack of other options

- Download from vendor specified locations (sites)
- Supported by provided or alternatively OSS communities
- Good for Developer & Engineers, Admins & Ops, and Architect & Managers
Red Hat plugins for VSCode add IDE superpowers for Java, Kubernetes YAML and Fuse XML.

The OpenShift plugin allows developers to quickly connect and deploy to OpenShift instances locally or remotely.

Dependency Analytics adds license and CVE package alerts.

Available now in Marketplace directly from VS Code!
CodeReady Studio

Where to download?
- Red Hat Customer Portal
- Red Hat Developers
- Eclipse Marketplace (JBoss Tools)

How do I get support?
- Open Source communities
- Red Hat Support (with proper entitlements)

Who should use this?
- Developers & Engineers,
- Administrators & Operators
- Architects & Managers

What are the benefits?
- Local workstation IDE, tailored for extreme productivity
- Red Hat branded & supported Eclipse IDE (previously JBDS)
- Red Hat tested and certified for compatibility
- Provides supplemental integration tooling in support of Red Hat middleware
- Available as BYO JBoss Tools from Eclipse Marketplace
CodeReady Workspaces

Where to download?
- Red Hat Customer Portal
- Red Hat Developers

How do I get support?
- Open Source communities
- Red Hat (with proper entitlements)

Who should use this?
- Developers & Engineers,
- Administrators & Operators

What are the benefits?
- Centralized developer IDE platform
- Browser-based Web IDE + container based workspaces
- Source code never lands on hard-to-secure laptops
- Red Hat supported Eclipse Che
- Installed and enabled via an operator
- Pre-configured and custom stacks (tools and runtimes)
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Operator Framework

For Builders and the community
- Easily create application on Kubernetes via a common method
- Provide standardized set of tools to build consistent apps

For application consumers and Kubernetes users
- Keep used apps up to date for security reasons and app lifecycle management
- Consumer of cloud-native / kube-native applications more secure and easier
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

![Diagram](image-url)

Helm SDK | Ansible SDK | Go SDK
---|---|---
"No code" Operator | Perfect for Ops | Full power & features

- Testing framework & Scorecard

- Red Hat verification

- OperatorHub

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Operator Maturity Model

Phase I: Basic Install
Automated application provisioning and configuration management

Phase II: Seamless Upgrades
Patch and minor version upgrades supported

Phase III: Full Lifecycle
App lifecycle, storage lifecycle (backup, failure recovery)

Phase IV: Deep Insights
Metrics, alerts, log processing and workload analysis

Phase V: Auto Pilot
Horizontal/vertical scaling, auto config tuning, abnormal detection, scheduling tuning

HELM

ANSIBLE

#redhat #rhsummit
Operator Lifecycle Manager

- Operators are installed cluster-wide, not per namespace
  - All teams get access with minimal fuss and overhead
- In 4.1+, OperatorGroups will allow groups to be deployed together
  - Install Foo and Bar Operator in NS where env=prod

Create Operator Subscription
Keep your service up to date by subscribing to a channel and update strategy

Target *
Select Operator Group
Select Operator Group

Update Channel *
- alpha

Approval Strategy *
- Automatic
- Manual
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
Developer Catalog

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

- External Application Launcher
- Native Experience
- Native + External Links
- Core Platform
- Dev. Catalog
- Metering & Chargeback
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> Demo - How do you OpenShift
[ Demo: How Do You OpenShift ]

OpenShift
- Web console walkthrough
- oc walkthrough
- odo resources and tutorial
- Visualize the OpenShift APIs
- Interactive learning

Container Tools
- Podman resources and tutorials
- Buildah resources and tutorials
- Skopeo resources and examples
- OpenShift interactive learning

Operators Framework and SDK -- Building Operators on OpenShift
7:45 - 8:30 PM - 4 ways to jump start an open source & agile automation culture

TUESDAY

10:15-11:00 AM - Day-in-the-Life: Designing Software for Open Innovation Labs
11:15-12:00 PM - How Volkswagen used microservices & automation to develop self-service solutions
12:15-1:00 PM - Container adoption at scale: Metrics-driven framework and other lessons learned
3:15-4:00 PM - The road to RHEL 8: Best practices for optimizing your operating system
4:15-5:00 PM - Adoptando RHEL 8: Las mejores practicas para optimizar tu Sistema Operativo
5:15-6:00 PM - A DevOps survival guide: Small changes lead to big results
6:15-7 PM - Digital Nudge: How automation, machine learning, A.I., and more shape our digital decisions

WEDNESDAY

10:15-11:00 AM - OpenShift DevSecOps: Making your enterprise more secure for tomorrow, today
11:45-12:30 PM - To the Edge and Beyond: Network Automation for Telecommunications
12:45-1:30 PM - People first, digital second: Using open principles to drive transformation at Heritage Bank
1:45-2:30 PM - Monoliths in OpenShift: Application onboarding strategies for containers

THURSDAY
THANK YOU

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youtube.com/user/RedHatVideos
facebook.com/RedHatInc
twitter.com/RedHat