

# 1 OpenShift CheatSheet

## CLOUD

- PDF Link: [cheatsheet-openshift-A4.pdf](#), Category: Cloud
- Blog URL: <https://cheatsheet.dennyzhang.com/cheatsheet-openshift-A4>
- Related posts: PKS CheatSheet, Kubectl CheatSheet, #denny-cheatsheets

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## 1.1 OpenShift FAQ

| Name   | Summary                                       |
|--|---|
| Kubernetes versions for different OpenShift versions | openshift 3.9, openshift 3.10, openshift 3.11 |

## 1.2 OpenShift Key Components

| Name                              | Command  |
|-----------------------------------|--|
| Computing virtualization          | RHV (Red Hat Virtualization), based on KVM                 |
| SDN networking                    | Based upon OVS   |
| VM/Cluster lifecycle management   | CloudForms ?   |
| Node healing                      | Notification of failed components but no recovery          |
| Container optimized OS            |  |
| Container Image Compliance Scan   | CloudForms OpenSCAP, like Harbor Clair                     |
| Container runtime                 | dockerd, cri-o   |
| Container image registry          | OpenShift Container Registry (OCR), powered by Redhat Quay |
| Packages k8s cluster orchestrator | tectonic ?   |
| Component Packaging               | Ansible modules?   |
| CSI for Persistent volume         | GlusterFS, NFS, Local storage                              |
| Authorization                     | OpenShift Container Platform policy engine                 |
| Disater Recovery                  | Notification of failed components but no recovery          |
| Control Plane                     |  |
| Reference                         | Link: OpenShift Container Platform Cluster Limits          |
| Reference                         | Link: OpenShift Key Components, Link: PKS Key Components   |

<https://raw.githubusercontent.com/dennyzhang/cheatsheet.dennyzhang.com/master/cheatsheet-openshift-A4/architectureoverview.png>

## 1.3 New Concepts From OpenShift

| Name                                | Command          |
|-------------------------------------|------------------|
| BuildConfig                         |                  |
| Source2Image(s2i)                   |                  |
| Templates                           | Like helm chart  |
| Pipelines                           | Jenkins          |
| Fine grained security policies OOTB | Like k8s psp     |
| Security Context Constraints(SCC)   |                  |
| Red Hat Container Catalog (RHCC)    |                  |
| Route                               | Like k8s ingress |
| Metering and Chargeback             |                  |
| Operator SDK                        |                  |

## 1.4 OpenShift Solutions

| Name                             | Command   |
|----------------------------------|---|
| OpenShift Online                 | Hosted by Red Hat in AWS public cloud                                       |
| OpenShift Dedicated              | Virtual private cloud, managed by Red Hat in any AWS region                 |
| OpenShift Container Platform OKD | Any on-premise, public, or private cloud infra with RedHat Enterprise Linux |
| Minishift                        |   |
| Reference                        | Link: OpenShift plans and pricing   |

<https://raw.githubusercontent.com/dennyzhang/cheatsheet.dennyzhang.com/master/cheatsheet-openshift-A4/openshift-ansible-flow.png>

## 1.5 OpenShift Glossary

| Name                     | Command   |
|--------------------------|---|
| OKD                      | The Origin Community Distribution of Kubernetes that powers Red Hat OpenShift.                        |
| oc command line          | OpenShift command line: <code>oc &lt;action&gt; &lt;object_type&gt; &lt;object_name_or_id&gt;</code>  |
| Project                  | Namespace in Kubernetes. Resources are aggregated by projects. <code>oc get project</code>            |
| Build                    | Builds create a new image from source code, other images, Dockerfiles, etc. <code>oc get build</code> |
| Build Configuration      | How to build source code and a base image into a new image. <code>oc get bc</code>                    |
| Route                    | Endpoint in Kubernetes. A route is an external DNS entry  |
| Deployment Configuration | <code>oc get dc</code>  |
| ImageStream              | <code>oc get is</code>  |
| ImageStreamTag           | <code>oc get istag</code>   |
| ImageStreamImage         | <code>oc get isimage</code>   |
| Template                 | <code>oc get template</code>  |
| Template Instance        | <code>oc get templateinstance</code>  |
| Explain                  | Online manual <code>oc explain pod</code>   |
| Red Hat Registry         | By default, all images are pulled from registry.redhat.io.  |
| OpenShift SaaS Version   | <a href="https://openshift.io/">https://openshift.io/</a>   |
| OpenShift online         | <a href="https://cloud.openshift.com">https://cloud.openshift.com</a>                                 |
| Reference                | Minishift CheatSheet Link: Minishift  |
| Reference                | OpenShift CheatSheet, Rancher CheatSheet, PKS CheatSheet  |

## 1.6 OpenShift Assumptions

| Name                   | Summary  |
|------------------------|--|
| Single instance of K8S | One OpenShift One K8S. Use k8s namespace solely for multi-tenancy                                    |
| No mixed versions      | Versions must match between master and node hosts, excluding upgrade; Old oc can talk to new servers |
| Node roles             | Master nodes, worker nodes, and etcd nodes.  |

## 1.7 OpenShift Maintainance

| Name                 | Command   |
|----------------------|---|
| Install clusters     | Run ansible playbooks to install OpenShift  |
| Upgrade clusters     | Support both in-place upgrade and blue-green deployments; Use ansible to upgrade clusters |
| Node problem healing |   |

## 1.8 OpenShift Cfg Files

| Name  | Summary  |
|---|--|
| The default image stream and template files         | <code>/usr/share/openshift/examples/</code> , <code>/etc/origin/examples/</code>         |
| Data folder for master and worker nodes             | <code>/var/lib</code>  |
| Volumes and potential core dumps of the binary      | <code>/var/lib/origin</code>   |
| Cloud provider specific conf(AWS, Azure, etc)       | <code>/etc/origin/cloudprovider</code>   |
| Additional third party volume plug-ins              | <code>/usr/libexec/kubernetes/kubelet-plugins</code> , <code>/etc/origin/kubelet-</code> |
| All certificates, conf files, admin.kubeconfig, etc | <code>/etc/origin/master</code>  |
| Master node conf profile                            | <code>/etc/origin/master/admin.kubeconfig</code>   |
| Used for node bootstrapping nodes other than master | <code>/etc/origin/master/bootstrap.kubeconfig</code>                                     |
| Node conf profile                                   | <code>/etc/origin/node/node.kubeconfig</code> , <code>/etc/origin/node/node-confi</code> |

## 1.9 OC - Highlights

| Name  | Command  |
|---|--|
| Get api requests verbose output with kubectl call | <code>oc --loglevel 999 get pod/dummy-deployment-6d6759c786-5kwth</code>               |
| Start a pod and get a shell for debug             | <code>oc debug dc/jorge</code>   |
| Impersonate for oc command                        | <code>oc --as=jorge get pods, oc --as-group=developers get pods</code>                 |
| Use oc to do admin operations                     | <code>oc adm &lt;sub-command&gt;</code>  |
| Try experimental commands of oc                   | <code>oc ex &lt;sub-command&gt;</code>   |
| Explain OpenShift/Kubernetes concepts to me       | <code>oc explain pod, oc explain replicaset</code>                                     |
| Enable oc shell autocompletion                    | <code>echo "source &lt;(oc completion zsh)" &gt; ~/.zshrc, then reload terminal</code> |
| Reference   | OpenShift CheatSheet, Kubectl CheatSheet   |

## 1.10 OC - Admin

| Name                                       | Command                                     |
|--|---|
| Login/logout                               | <code>oc login, oc logout, oc whoami</code> |
| List route                                 | <code>oc get route</code>                   |
| List all object types                      | <code>oc types, oc api-resources</code>     |
| Start a local OpenShift all-in-one cluster | <code>oc cluster up</code>                  |

## 1.11 OC - Developer

| Name                                   | Command   |
|--|---|
| Create a project                       | <code>oc new-project &lt;projectname&gt; --description=&lt;description&gt; --display-name=&lt;name&gt;</code> |
| Check status of current project        | <code>oc status</code> Link: OC CLI Operations  |
| Show oc cli profile                    | <code>oc config view</code> Link: Managing CLI Profiles   |
| Get all resource                       | <code>oc get all</code>   |
| Switch project                         | <code>oc project &lt;projectname&gt;</code>   |
| Create an application                  | <code>oc new-app https://github.com/sclorg/cakephp-ex</code>  |
| Create a new build                     | <code>oc new-build https://github.com/sclorg/cakephp-ex</code>  |
| Manually start a build with given conf | <code>oc start-build &lt;buildconfig_name&gt;</code>  |
| Stop a build that is in progress       | <code>oc cancel-build &lt;build_name&gt;</code>   |
| Import an external image               | <code>oc import-image &lt;image_stream&gt;</code>   |
| Tag an image                           | <code>oc tag &lt;current_image&gt; &lt;image_stream&gt;</code>  |

## 1.12 OpenShift Source Code

| Name                         | Command  |
|------------------------------|--|
| Openshift Ansible Deployment | GitHub: <a href="https://github.com/openshift/ansible">openshift-ansible/playbooks</a> |

## 1.13 OpenShift Opportunity

| Name  | Command |
|---|---------|
| Doesn't support multiple clusters                 |         |
| OC command line could be a strength or a weakness |         |
| Lack of SDN solution                              |         |
| Time-consuming for administrators' operations     |         |

## 1.14 OpenShift CLI Help All

```
/User/zdenny > oc --help
OpenShift Client
```

This client helps you develop, build, deploy, and run your applications on any OpenShift or Kubernetes compatible platform. It also includes the administrative commands for managing a cluster under the 'adm' subcommand.

```
Usage:
  oc [flags]
```

```
Basic Commands:
  types          An introduction to concepts and types
```

|             |   |
|-------------|---|
| login       | Log in to a server                      |
| new-project | Request a new project                   |
| new-app     | Create a new application                |
| status      | Show an overview of the current project |
| project     | Switch to another project               |
| projects    | Display existing projects               |
| explain     | Documentation of resources              |
| cluster     | Start and stop OpenShift cluster        |

#### Build and Deploy Commands:

|              |   |
|--------------|---|
| rollout      | Manage a Kubernetes deployment or OpenShift deployment config |
| rollback     | Revert part of an application back to a previous deployment   |
| new-build    | Create a new build configuration                              |
| start-build  | Start a new build   |
| cancel-build | Cancel running, pending, or new builds                        |
| import-image | Imports images from a Docker registry                         |
| tag          | Tag existing images into image streams                        |

#### Application Management Commands:

|                 |   |
|-----------------|---|
| get             | Display one or many resources   |
| describe        | Show details of a specific resource or group of resources                         |
| edit            | Edit a resource on the server   |
| set             | Commands that help set specific features on objects                               |
| label           | Update the labels on a resource   |
| annotate        | Update the annotations on a resource  |
| expose          | Expose a replicated application as a service or route                             |
| delete          | Delete one or more resources  |
| scale           | Change the number of pods in a deployment   |
| autoscale       | Autoscale a deployment config, deployment, replication controller, or replica set |
| secrets         | Manage secrets  |
| serviceaccounts | Manage service accounts in your project   |

#### Troubleshooting and Debugging Commands:

|              |   |
|--------------|---|
| logs         | Print the logs for a resource                                 |
| rsh          | Start a shell session in a pod                                |
| rsync        | Copy files between local filesystem and a pod                 |
| port-forward | Forward one or more local ports to a pod                      |
| debug        | Launch a new instance of a pod for debugging                  |
| exec         | Execute a command in a container                              |
| proxy        | Run a proxy to the Kubernetes API server                      |
| attach       | Attach to a running container                                 |
| run          | Run a particular image on the cluster                         |
| cp           | Copy files and directories to and from containers.            |
| wait         | Experimental: Wait for one condition on one or many resources |

#### Advanced Commands:

|         |   |
|---------|---|
| adm     | Tools for managing a cluster                                  |
| create  | Create a resource from a file or from stdin.                  |
| replace | Replace a resource by filename or stdin                       |
| apply   | Apply a configuration to a resource by filename or stdin      |
| patch   | Update field(s) of a resource using strategic merge patch     |
| process | Process a template into list of resources                     |
| export  | Export resources so they can be used elsewhere                |
| extract | Extract secrets or config maps to disk                        |
| idle    | Idle scalable resources                                       |
| observe | Observe changes to resources and react to them (experimental) |
| policy  | Manage authorization policy                                   |
| auth    | Inspect authorization   |
| convert | Convert config files between different API versions           |

|               |  |
|---------------|--|
| import        | Commands that import applications  |
| image         | Useful commands for managing images  |
| registry      | Commands for working with the registry   |
| api-versions  | Print the supported API versions on the server, in the form of "group/version" |
| api-resources | Print the supported API resources on the server                                |

#### Settings Commands:

|            |  |
|------------|--|
| logout     | End the current server session                                     |
| config     | Change configuration files for the client                          |
| whoami     | Return information about the current session                       |
| completion | Output shell completion code for the specified shell (bash or zsh) |

#### Other Commands:

|         |  |
|---------|--|
| ex      | Experimental commands under active development |
| help    | Help about any command                         |
| plugin  | Runs a command-line plugin                     |
| version | Display client and server versions             |

Use "oc <command> --help" for more information about a given command.

Use "oc options" for a list of global command-line options (applies to all commands).

## 1.15 OpenShift CLI Help Admin

```
/User/zdenny > oc adm  
Administrative Commands
```

Commands for managing a cluster are exposed here. Many administrative actions involve interaction with the oc client as well.

#### Usage:

```
oc adm [flags]
```

#### Component Installation:

|            |  |
|------------|--|
| router     | Install a router                               |
| ipfailover | Install an IP failover group to a set of nodes |
| registry   | Install the integrated Docker registry         |

#### Security and Policy:

|             |                               |
|-------------|-------------------------------|
| new-project | Create a new project          |
| policy      | Manage policy                 |
| groups      | Manage groups                 |
| ca          | Manage certificates and keys  |
| certificate | Modify certificate resources. |

#### Node Management:

|                    |   |
|--------------------|---|
| create-node-config | Create a configuration bundle for a node          |
| manage-node        | Manage nodes - list pods, evacuate, or mark ready |
| cordon             | Mark node as unschedulable                        |
| uncordon           | Mark node as schedulable                          |
| drain              | Drain node in preparation for maintenance         |
| taint              | Update the taints on one or more nodes            |
| pod-network        | Manage pod network                                |

#### Maintenance:

|             |  |
|-------------|--|
| diagnostics | Diagnose common cluster problems                   |
| prune       | Remove older versions of resources from the server |
| build-chain | Output the inputs and dependencies of your builds  |
| migrate     | Migrate data in the cluster                        |
| top         | Show usage statistics of resources on the server   |

|                                     |  |
|-------------------------------------|--|
| <code>verify-image-signature</code> | Verify the image identity contained in the image signature |
|-------------------------------------|--|

**Configuration:**

|   |  |
|---|--|
| <code>create-kubeconfig</code>                  | Create a basic <code>.kubeconfig</code> file from client certs |
| <code>create-api-client-config</code>           | Create a config file for connecting to the server as a user    |
| <code>create-bootstrap-project-template</code>  | Create a bootstrap project template                            |
| <code>create-bootstrap-policy-file</code>       | Create the default bootstrap policy                            |
| <code>create-login-template</code>              | Create a login template  |
| <code>create-provider-selection-template</code> | Create a provider selection template                           |
| <code>create-error-template</code>              | Create an error page template                                  |

**Other Commands:**

|                         |  |
|-------------------------|--|
| <code>completion</code> | Output shell completion code for the specified shell (bash or zsh) |
| <code>config</code>     | Change configuration files for the client                          |

Use `"oc adm <command> --help"` for more information about a given command.

Use `"oc adm options"` for a list of global command-line options (applies to all commands).

## 1.16 More Resources

<https://www.okd.io/>

[https://access.redhat.com/documentation/en-us/openshift\\_container\\_platform/3.11/](https://access.redhat.com/documentation/en-us/openshift_container_platform/3.11/)

[https://access.redhat.com/documentation/en-us/openshift\\_container\\_platform/3.11/html/cli\\_reference/](https://access.redhat.com/documentation/en-us/openshift_container_platform/3.11/html/cli_reference/)

`cli-reference-basic-cli-operations`

<https://docs.okd.io/latest/minishift/getting-started/quickstart.html>

<https://www.openshift.com/>

<https://docs.openshift.com/online/architecture/index.html>

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